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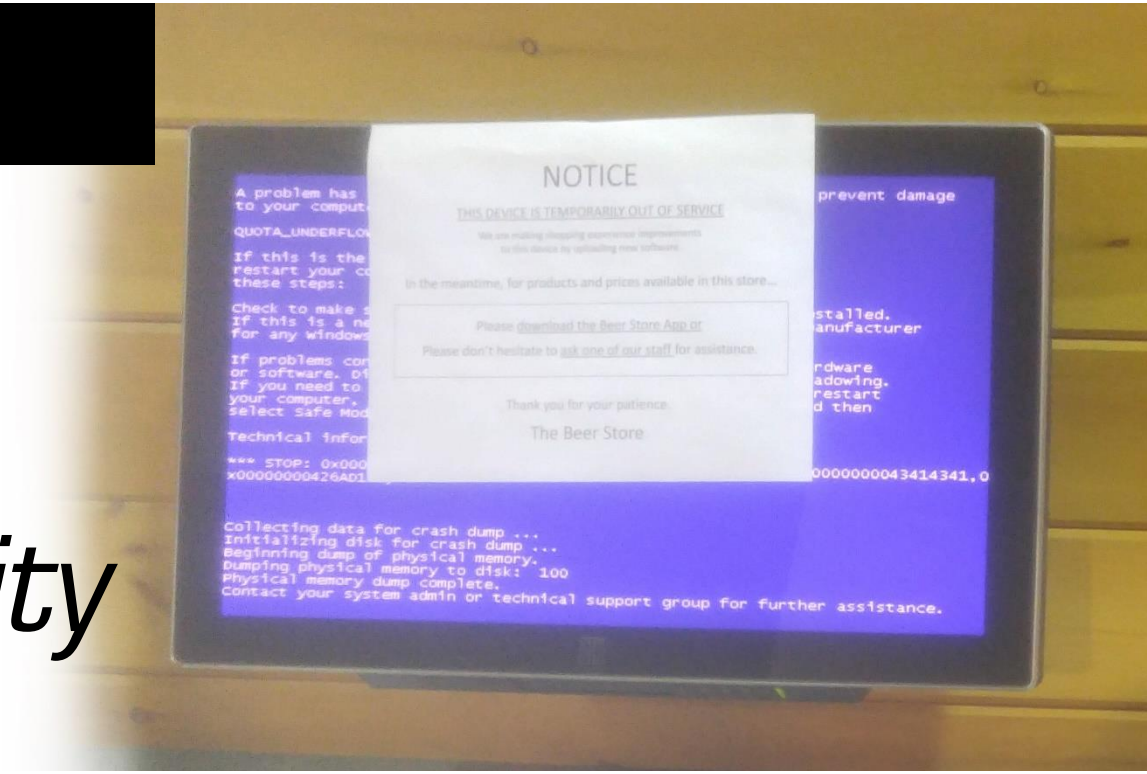
INFO-6076



Web Security

Course Introduction

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Agenda

- Course Information
- Components of Web Applications
- Web App Security
- Lab 01 – VM lab set up

Course Information

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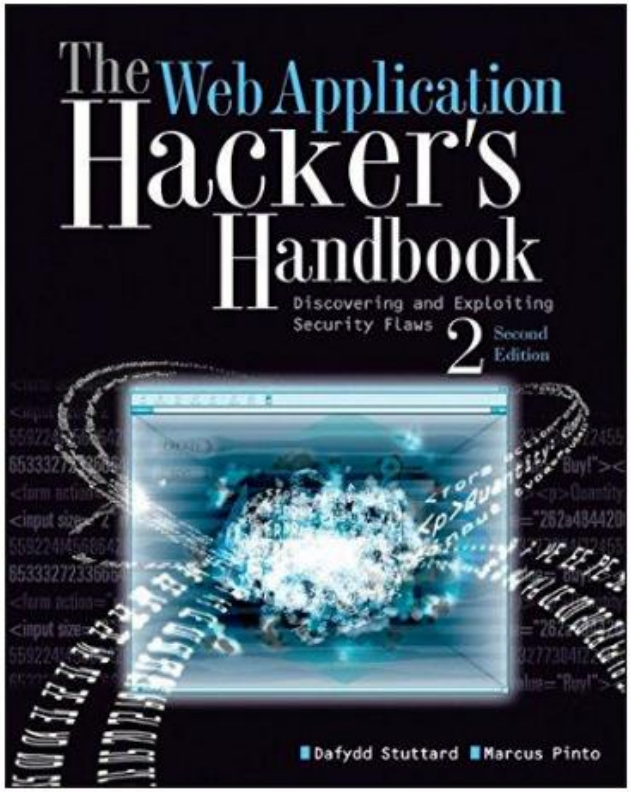
Course Textbook

- This course does not have a required textbook
- The **recommended** textbook is:



The Web Application Hacker's Handbook

ISBN
9781118175248

Contact Information

Email: a_mackiewicz2@fanshaweonline.ca

Email Tips:

- Include the course number in the **subject**:
  INFO-6076 - Question about Test 1
- You must send emails from your @fanshaweonline.ca address
- Please keep your email brief and to the point
- Don't be afraid to use the point form:
  - 1) When do we …
  - 2) How to ..
- Please do not wait until the last minute to send your email!
- Please send emails only in the plaintext format
- Emails will be typically be answered in 24 hours (Monday-Friday)

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General Information

- The course is assigned **4 hours per week**:
  - A 2-hour lecture/lab followed by a 2-hour lab only session each week
  - There are no lectures or labs on the weeks in which you have a test or exam

The labs will develop essential skills and reinforce the lecture content

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Course Evaluation Methods

- Tests and Exams: (70%)

There are two tests (weeks 5 & 10) and the final exam

- Details can be found in the CIS

- Labs (30%)

Labs are delivered weekly

- Students must finish and submit the lab by the **deadline** posted on Fanshawe Online
- Only your latest submission will be graded

Test / Exam Format

This is a general guideline:

The majority of your test/exam questions will be in one or more of the following formats:

- Multiple Choice
- Multi-Select
- True False
- Matching/Ordering

There may be short answer questions on the tests/exam

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Test Dates

Scheduled Test Dates:

Test 01 in Week 05:

- Monday January 30th

Test 02 in Week 10:

- Monday March 13th

Final Exam in Week 15:

- Date/Time/Location to be announced

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Lab Details

- You need to do the labs yourself
- Do not rely on your fellow student's answers
- Don't share screenshots with other students
- Do not edit/modify screenshots in Photoshop or any other software (you can, however, resize / cut images)
- Make sure your screenshots:
  - ✓ 'fit' into the PowerPoint screen
  - ✓ Include your student information
  - ✓ Are in the correct order

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Lab Details

- Please follow the lab instructions precisely. Don't skip any steps…
- Before asking any questions, please use 'common sense':
  - Double check that you have all the required software/components running
  - Apply what you've learned from the previous labs
  - Try to resolve the issue yourself instead of looking for an easy answer
- Make sure you have no network/connectivity issues with your VM
  - Shutdown all the other VMs
  - Make sure your VM has the proper network settings (NAT, Bridge mode, etc.)
  - Check network adapter(s) settings; disable wireless/wired adapter(s) not in use
  - Disable Windows/3rd party firewall(s), malware scanners on the host computer
  - Restart OS on the host computer
- Do not expect me to do the lab for you…

  For instance, if you need to find some URL in the lab, please don't ask me to help you find it

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Lab Details

- You will find all the required files for your labs online through a provided link or on Fanshawe Online

- I will provide you with any download links as required in the lab instructions

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Topics

- Web Application Enumeration
- Authentication Management
- Web App Penetration Testing
- Access Control
- XSS / CSRF
- Injection Attacks
- The Dark Web / TOR
- Automation
- Web Server Security

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Components of Web Apps

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Components of Web Apps

- You should have a good understanding of the different languages that make up Web Applications
- You will need to be able to differentiate between Markup, Scripting, Backend, and Database components

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Components of Web Apps

- Markup languages
  - SGML
  - HTML
  - XML
  - XHTML
  - CSS
- Scripting Languages
  - JavaScript
  - JS
  - JSON
  - AJAX

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Components of Web Apps

- Backend (Server Side) Languages
  - PHP
  - Python
  - Perl
  - Ruby
  - ASP
  - .NET

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Components of Web Apps

- Databases
  - MS SQL
  - MySQL
  - PostgreSQL
  - Oracle
  - MariaDB

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The Changing landscape of Web Apps

- Web applications have become a lot more complex
  - Importing scripts
  - Linking to analytic servers
  - Advertisements
  - User input
- All of the extra code required for user engagement also creates an opportunity for exploitation

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The Changing landscape of Web Apps

- As opposed to being static web sites, most are now complex Web applications that require user input
  - Login/Authentication
  - E-Commerce
  - Online Banking
  - Social Media
  - User created content
  - Forums

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The Changing landscape of Web Apps

- Most web applications now have different interfaces for various platforms
  - Mobile Apps
  - Use HTTP-based APIs

- Business software that used to be accessed through a network computer can now be accessed through web apps
  - Outlook Web Access / Office 365
  - Google Apps

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Web App Security

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Web App Security

- Organizations used to rely on perimeter security
- Web applications need to allow user traffic to access them
- This creates a problem because back end servers can be compromised through a web app

Web App Security

- OWASP's Top Ten list keeps evolving
- Certain vulnerabilities change due to various reasons
  - User awareness
  - Developer awareness
  - Browser security
- Problem is that new vulnerabilities arise to replace old ones

Web App Security

- The core security problem lies within user input
- Malicious users can alter data being sent to a server through:
  - Request parameters
  - Cookies
  - HTTP headers
- These can be done using automated tools in addition to manual input manipulation

Web App Security

- SSL does not stop a malicious user from altering the data a server is expecting
  - Hidden HTML form fields
  - Modified session tokens
  - Tampering with parameters
  - Injection attacks

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Web App Security

- Adding functionality to web applications increases their attack surface
- More lines of code = More potential vulnerabilities
  - Password recovery
  - Username recovery
  - Password hints
  - Etc.

Lab Details

LAB-01: Overview

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Lab-01: Overview

- Download client and server VM files
- Kali VM prep
- Windows 10 VM prep
- Windows Server 2016 VM prep
- Metasploitable2 Server VM prep
- Ubuntu 18.04 LTS Server VM prep

Wrapping up…

- Questions…?