George Mason University  
CFRS 768 – Cyber Warfare  
CRN 17222, Sec 001  
Spring 2015, January 23 – May 8, Fridays, 4:30-7:10PM  
ENGR 5358

Instructor

Michael Robinson  
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Office Hours: Available upon request

Description

This course will explore the rapidly changing face of cyber warfare and cyber terrorism. Students will identify and characterize the fundamental aspects of cyber terrorism and the role of computers and the Internet in terrorist acts on information systems and critical infrastructure components. Students will analyze cyber warfare techniques, such as Denial of Service (DoS) attacks on critical infrastructure, man-in-the-middle attacks, sabotage, and espionage. Students will evaluate the various cyber crimes that are being used to finance terrorism and cyber criminal activities.

Learning Objectives

Upon completing the course, students will be able to:

- Compare several cyber attacks sponsored by rogue nations using open source intelligence and analyze the attack vectors that were implemented in each.
- Compare the motivations behind cyber warfare and cyber terrorist attacks against corporate and government systems.
- Select the appropriate computer security tools to detect and analyze indicators of an attack.
- Analyze the differences between a cyber warfare attack and a typical malware/virus attack.
- Design a mock scenario that simulates a cyber attack using current attack vectors to prepare for a cyber event.

Required Materials

The following texts will be used for the class:


The following texts will be used and made available via Blackboard:


In addition to the above listed items, the following publications will be made available in Blackboard as optional readings to augment the required course content.


**Graded Material**

Each assignment, quiz, project, and exam will be graded on a 0-100 point scale.

The final average is calculated by the following weights:

- Assignments – Six Annotated Bibliographies............ 25%
- Classroom Discussions ........................................... 10%
- Mid-term.............................................................. 25%
- Project – Cyber Warfare Tabletop Exercise .......... 15%
- Final Exam........................................................... 25%
- Total ................................................................. 100%

The following criteria will be used for the assignment of letter grades

- A  92-100
- A-  90-91
- B+  87-89
- B  83-86
- B-  80-82
- C  70-79
- F  0-69

The course will adhere to the university’s policies on grading.
Assignment Due Dates

All assignments are to be submitted by the due dates listed in the syllabus. Work will not be accepted late. Assignments are to be submitted via Blackboard.

Projects

Each student will prepare a written report, which describes a detailed war gaming exercise: A cyber attack simulated through a tabletop exercise. The requirements of the project will be posted in Blackboard by the second week of class. A tabletop exercise will be led during the second week of the course in class. The report will be due in the fourteenth week of the course.

Class Attendance

Attendance is mandatory. A number of classes will involve in-class discussions conducted through seminar-style lectures. In the event that a student cannot attend class due to an emergency or crisis, the student is to contact the instructor as soon as possible.

Responsible Use of Computing Policy

Use of computer equipment, including Internet connections within the classroom will be conducted in accordance with the University’s Responsible Use of Computing (RUC) Policy. This applies to all academic and operational departments and offices at all university locations owned or leased. The policies and procedures provided here apply to all Mason faculty, staff, students, visitors, and contractors.

The university provides and maintains general computing services, including web and Internet resources, and telecommunication technology to support the education, research, and work of its faculty, staff, and students. At the same time, Mason wishes to protect all users’ rights to an open exchange of ideas and information. This policy sets forth the responsibilities of each member of the Mason community in preserving the security, confidentiality, availability, and integrity of Mason computing resources. To accomplish these ends, this policy supports investigations of complaints involving Mason computing abuse, including sexual harassment, honor code, federal, state, applicable industry, and local law violations.

University faculty and staff members, as state employees, are subject to the Freedom of Information Act, §2.2-3700, et seq., of the Code of Virginia, and all applicable state and federal rules and regulations. While this policy endeavors to maintain user confidentiality, it cannot create, nor should faculty or staff members presume, any expectation of privacy.

Violations of this policy may result in revocation of access, suspension of accounts, disciplinary action, or prosecution. Evidence of illegal activity will be turned over to the appropriate authorities. It is the responsibility of all users of Mason computing resources to read and follow this policy and all applicable laws and procedures (user sign-on agreement).

For more information regarding the RUC Policy, consult the student handbook.
University Policies

This course will be taught in compliance with George Mason University policies, which can be found online at http://universitypolicy.gmu.edu/

Important Dates

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last day to drop with no tuition penalty</td>
<td>January 27</td>
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<tr>
<td>Last day to drop with a 33% tuition penalty</td>
<td>February 10</td>
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<tr>
<td>Last day to drop with a 67% tuition penalty</td>
<td>February 20</td>
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<tr>
<td>Spring Break</td>
<td>March 9-15</td>
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<tr>
<td>Final Exams</td>
<td>May 6-13</td>
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The full calendar maintained by the University Registrar can be found online at: http://registrar.gmu.edu/calendars/2013fall/

Office of Disability Services

The Office of Disability Services (ODS) is available to serve all students with disabilities, including those with cognitive (e.g., learning, psychological, and closed head injury), sensory, mobility, and other physical impairments.

The Office of Disability Services serves qualified students with disabilities to ensure equal access to the university’s programs and services. A qualified student with a disability is a student with a disability, who meets the academic and technical standards required for admission or participation in the university’s educational program and services. As defined in the Americans with Disabilities Act (ADA), and section 504 of the Rehabilitation Act of 1973, a person has a disability if he/she:

- Has a physical or mental impairment which substantially limits one or more major life activities, or
- Has a record of such impairment, or
- Is regarded as having such impairment

Students requesting assistance should contact the Office of Disability Services at http://ods.gmu.edu/

Course Outline

The following is the course outline. It is subject to revision.

Week 1 Introduction to Cyber Warfare and Course Familiarization


**Week 2**  
1/30  
**Cyber Warfare Table Top Exercise**

**Week 3**  
2/6  
**Seminar Discussion on Cyber Warfare**

Reading assignment  


**Assignment**  
Annotated Bibliography #1  
Topic: Cyber Warfare – Real or Fiction? Are there real examples?  
Due by 4:00PM on 2/6

**Week 4**  
2/13  
**The Russian Federation and Eastern European Countries**

Reading assignment  


**Classroom material**  
Russian_Federation.pptx

**Week 5**  
2/20  
**Seminar Discussion on The Russian Federation and Eastern European Countries**

Reading assignment  


Assignment
Annotated Bibliography #2
Topic: Russian-based Cyber Warfare
Due by 4:00PM on 2/20

Week 6 2/27
The People’s Republic of China
Reading assignment


Week 7 3/6
Seminar Discussion on The People’s Republic of China
Reading assignment


Assignment
Annotated Bibliography #3
Topic: The People’s Republic of China
Due by 4:00PM on 3/6

3/13 Spring Break
### Week 8
#### Mid-term
3/20

### Week 9
#### Non-state Organizations (NSOs) and Cyber Attacks
3/27

**Reading assignment**
Bohn, L. E. and Satter, R. (2012, November 19.) "'Anonymous' targets Israeli websites over Gaza war." Retrieved on December 11, 2012 from the Yahoo! News website:
http://news.yahoo.com/anonymous-targets-israeli-websites-over-gaza-war-220548299.html


http://www.informationweek.com/security/attacks/who-is-anonymous-10-key-facts/232600322 (view this page and the following 10 pages.)


**Classroom material**
NSOs and Cyber Attacks.pptx

### Week 10
#### Seminar Discussion on Non-State Organizations (NSOs) and Cyber Attacks
4/3

**Reading assignment**
Bohn, L. E. and Satter, R. (2012, November 19.) "'Anonymous' targets Israeli websites over Gaza war." Retrieved on December 11, 2012 from the Yahoo! News website:
http://news.yahoo.com/anonymous-targets-israeli-websites-over-gaza-war-220548299.html


December 11, 2012 from the ComputerWorld website:

http://www.informationweek.com/security/attacks/who-is-anonymous-10-key-facts/232600322 (view this page and the following 10 pages.)


Assignment
Annotated Bibliography #4
Topic: Non-State Organizations (NSOs) and Cyber Attacks
Due by 4:00PM on 4/3

Week 11
Cyber Terrorism; Tools and Targets; The Role of Social Networking
4/10

Reading assignment


Classroom material
Cyber Terrorism.pptx
Tools and Targets.pptx
Social Networking.pptx

Week 12 Seminar Discussion on Cyber Terrorism; Tools and Targets; The Role of Social Networking
4/17

Reading assignment


Assignment
Annotated Bibliography #5
Topics: Cyber Terrorism; Tools and Targets
Due by 4:00PM on 4/17
Week 13  
4/24  
U.S. Policies – Defensive and Offensive Cyber Initiatives

Reading assignment


Classroom material: US Initiatives.pptx

Week 14  
5/1  
Seminar Discussion on U.S. Policies – Defensive and Offensive Cyber Initiatives

Reading assignment


Assignment
Annotated Bibliography #6
Topics: U.S. Engagement in Cyber Warfare
Due by 4:00PM on 5/1

Project – Cyber Warfare Tabletop Exercise

Week 15  
5/8  
Final Exam

5/8