



**Department of Information Sciences and Technology**  
***Volgenau School of Engineering***  
**IT 353 Information Defense Technologies**  
**Spring 2017**

## **Common Syllabus**      revised 1/25/2017

This syllabus contains information common to all sections of IT 353 for the Spring 2017 semester. Information specific to each section will be made available to registered students via [the Blackboard course management system](#).

### **University Policies**

The [University Catalog](#) is the central resource for university policies affecting student, faculty, and staff conduct in university affairs. Unless explicitly noted, any conflict between the policies in the University Catalog and the content of this document is unintentional. Please notify the author to resolve any such conflicts.

Please note that the Academic Year runs from the Fall semester of one calendar year through the Spring and Summer semesters of the following calendar year. Please be sure to select the correct archived Catalog if appropriate.

### **Scheduled Sections**

<b>Section</b>	<b>Instructor</b>	<b>Campus</b>	<b>Day</b>	<b>Time</b>
<a href="#">001</a>	<a href="#">Prof. Lyons</a>	<a href="#">Science and Technology</a>	Wednesdays	4:30–7:10 p.m.
<a href="#">002</a>	<a href="#">Prof. McCallam</a>	<a href="#">Science and Technology</a>	Wednesdays	4:30–7:10 p.m.

Sections 001 and 002 will operate as a single combined section except for recordkeeping within PatriotWeb.

## Course Description

### **IT 353 - Information Defense Technologies**

Credits: 3

Limited to 2 Attempts

Offered by [Information Sciences and Technology](#)

This course will examine and assess the role of information technology as a tool of warfare and civil defense. Topics will be discussed from both defensive and offensive perspectives and will include asset tracking, asymmetric warfare, network centric warfare, physical attacks, cyberterrorism, espionage, psyops, reconnaissance and surveillance, space assets, and applications of GPS and cryptographic technology. Students will research and write about the social, ethical, and political effects of such technology.

**Prerequisite(s): (IT 101 or IT 105), and grade of "B" or better in IT 223**

Prerequisite enforced by registration system.

**Notes:** For INFT and AIT majors, minors and certificates,  
and BAS cybersecurity concentration only.

**Schedule Type: LEC**

**Hours of Lecture or Seminar per week: 3**

From [http://catalog.gmu.edu/preview\\_course.php?catoid=29&coid=304882](http://catalog.gmu.edu/preview_course.php?catoid=29&coid=304882)

## Prerequisites

The prerequisites for this course are ([IT 101](#) or [IT 105](#) , minimum grade "C") and [IT 223](#) (minimum grade "B"). The required grades **must** be achieved in each prerequisite course **before** a student is qualified to take this course. The prerequisite courses must be completed prior to, not concurrently with, this course.

This requirement will be **strictly enforced**. Any student who does not meet the prerequisite requirement (or receive a waiver) will be dropped from the course at the start of the semester and the student will be responsible for any consequences of being dropped.

## Rationale

This course is intended to prepare students for careers in homeland defense, the military, or defense contracts, and for graduate work in information security and assurance. Students will examine how changes in communications and information technology have led to dramatic changes in both offensive and defensive capabilities as well as exposing new flanks of vulnerability. Social and ethical implications will be carefully considered.

## **Course Applicability**

IT 366 is an option in the Information Security (INFS) concentration of the [Bachelor of Science in Information Technology](#), and a Technical Focus Course in the [Information Technology Minor](#) and the [Information Technology Undergraduate Certificate](#).

## **Objectives**

On successful completion of this course, students will:

- Understand the systems used in homeland defense and in military operations and the social and political implications of those systems.
- Be familiar with technologies that enable and support network-centric warfare.
- Understand the importance of tools for data fusion and battlespace awareness.
- Understand the concept of asymmetric warfare and its implications for traditional defense organizations and systems.
- Understand the use of technology to enable attacks against information systems and other strategic assets, and the use of technology to defend against attacks on those assets.
- Be able to write rules of engagement for information warfare operations.

## **Faculty and Staff**

Course Coordinator:

**Michael X. Lyons**

Instructors:

See **Scheduled Sections** above

Teaching Assistants:

*To be assigned – see Blackboard*

Administrative support:

Department of Information Sciences and Technology

Fairfax campus

5400 Nguyen Engineering Building

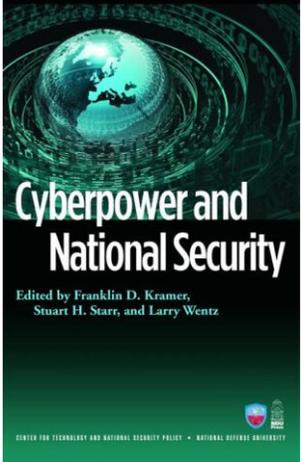
Email: [bsit@gmu.edu](mailto:bsit@gmu.edu)

Phone: 703-993-3565

## References

### Textbooks

There is one required textbook for this course:

	<p><u>Cyberpower and National Security</u>          edited by Franklin D. Kramer, Stuart H. Starr, and Larry K Wentz          2009; Potomac Books, Inc.</p>
	<p>Publisher's pricing (as of 8/26/2016):          Paperback \$39.95</p>

## Grading

Grades will be awarded in accordance with the Mason Grading System for undergraduate students. See the [University Catalog](#), [Academic Policies](#), [AP.3.1 Undergraduate Grading](#) for more information.

The grading scale for this course is:

97 – 100%	A+	Passing
93 – 96%	A	Passing
90 – 92%	A-	Passing
87 – 89%	B+	Passing
83 – 86%	B	Passing
80 – 82%	B-	Passing
77 – 79%	C+	Passing
73 – 76%	C	Passing
70 – 72%	C-	<i>Passing*</i>
60 – 69%	D	<i>Passing*</i>
0 – 59%	F	<b>Failing</b>

\* Grades of "C-" and "D" are considered passing grades for undergraduate courses. However:

- As of Catalog Year 2015-16 a minimum grade of "C" is required in all Concentration courses in the IT major.

Raw scores may be adjusted by the Instructor to calculate final grades.

Final grades will be determined based on the following components:

Assignments	20%
Project	30%
Mid-term exam	25%
Final exam	25%

These components are outlined in the following sections.

### Assignments

Work will be assigned in class several times during the semester. Each assignment will count towards the final grade - there are no "optional" assignments. Each homework assignment is to be prepared and submitted as specified by the Instructor.

Students are expected to submit work as scheduled by the Instructor. Any assignment submitted after the due date-time but within 24 hours of it will be graded with a penalty of 25% of the available credit. Any assignment submitted more than 24 hours late will not be graded.

### Project

Students will work in assigned teams to collectively complete a class project. The project requirements will be discussed in class and are subject to change throughout the semester. Each student's score for this component will be based in part on peer evaluations.

### Mid-term exam

The mid-term exam will be conducted during the 6<sup>th</sup> scheduled class session and will be based on topics addressed in Lectures 1-5. The mid-term exam will be "closed book" – no reference materials other than those provided with the exam paper will be permitted. Mid-term exams will be returned to students.

### Final exam

The final exam will be held during the scheduled final exam session (see [Spring 2017 Final Exams](#)) and will be based on topics addressed throughout the entire course. The final exam will be "closed book" – no reference materials other than those provided with the exam paper will be permitted. Final exams will be retained by the Department of Information Sciences and Technology and will not be returned to students.

Mid-term and final grades will be posted to [PatriotWeb](#), which is the only mechanism for students to obtain those grades. A student with a "hold" on his/her PatriotWeb account will be unable to access grades until the hold has been removed by the Registrar.

**Schedule**

<b>Lecture</b>	<b>Content</b>
1	Introductions, Logistics, Course Overview Basic concepts: information, defense, I.T. cyberspace, Cyberpower nations, national power
2	History of warfare Ethics and law in warfare Rules of engagement Project introduction; team formation
3	C <sup>4</sup> ISTAR Technology assignment
4	Cyberwar case study The OODA loop Levels of warfare
5	Information operations Perception management Information warfare, cyberwarfare Review for mid-term exam
6	<b>Mid-term exam</b> Project work
7	Asymmetric warfare Network-centric warfare
8	Robotics
9	Space warfare
10	Space warfare ( <i>continued</i> )
11	Project work / Guest lecture
12	Project exercise / Guest lecture
13	Guest lecture / Project exercise make-up date
14	Project team presentations Review for final exam
-	<b>Final exam</b>

*This schedule is subject to revision before and throughout the course.  
Registered students should see Blackboard for the latest class schedule.*

If a class is cancelled due to University closing or similar circumstance:

- The Provost may schedule a Make-Up Day, in which case the cancelled class will be held on that day, at the usual class time and in the usual classroom unless otherwise advised. Please note that the Make-Up Day may be on a different day of the week from the usual class day.
- If the Provost does not schedule a Make-Up Day the Instructor will schedule an *ad hoc* make-up session. The make-up session may be online – students will need Internet access and a compatible browser in order to participate in real time, but the session will be recorded for later viewing.

### Important Dates

Please see [Spring 2017 Semester](#) for important dates, including the last days to add and drop courses.

### Religious Holidays

[A list of religious holidays](#) is published by [University Life](#). Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor *at least 2 weeks in advance* of the conflict date in order to make alternative arrangements.

### Attendance Policy

Students are expected to attend every class, to complete any required preparatory work (including assigned reading – see **Schedule** above) and to participate actively in lectures, discussions and exercises. As members of the academic community, all students are expected to contribute regardless of their proficiency with the subject matter.

Students are expected to make prior arrangements with Instructor if they know in advance that they will miss any class and to consult with the Instructor as soon as possible if they miss any class without prior notice. Any student who expects to miss more than one class session is **strongly advised** to drop the course and take it in a later semester when he/she can attend every class.

[Mason policy](#) requires students to take exams at the scheduled time and place, unless prior approval is granted by the student's academic dean or director. Failure to attend a scheduled exam will result in a score of zero (0) for that exam. Please note that exams may be re-scheduled by the Registrar to compensate for disruptions in the semester schedule and *students are required to be available throughout the exam period including the scheduled Make-up Day*.

### Classroom conduct

Students are expected to conduct themselves in a manner that is conducive to learning, as directed by the Instructor. Any student who negatively impacts the opportunity for other students to learn may be asked to leave the classroom.

Electronic devices are potential distractions in the classroom environment. All electronic devices must be turned off or set to "silent" mode at all times unless the Instructors directs otherwise. In order to maximize student engagement the Instructor may prohibit use of such devices.

## **Communications**

Registered students will be given access to a Blackboard section for this course. Blackboard will be used as the primary mechanism (outside of lectures) to disseminate course information, including announcements, lecture slides, homework and other assignments, and scores for homework and exams. Some announcements may be sent via Blackboard to students' Mason email accounts.

Communication with the Instructor on issues relating to the individual student only should be conducted using Mason email, via telephone, or in person - *not* in the public "Discussions" forums on Blackboard. To protect student privacy any communication related in any way to a student's status must be conducted using secure Mason systems – if you use email to communicate with the Instructor you *MUST* send messages from your Mason email account. Students must activate and monitor their Mason email accounts to receive important information from the University, including messages related to this class.

**Lecture slides are complements to the lecture process, not substitutes for it - access to lecture slides will be provided in Blackboard as a courtesy to students *provided acceptable attendance is maintained.***

All course materials (lecture slides, assignment specifications, *etc*) are published on Blackboard in Adobe® Portable Document Format (PDF). This allows users of most computing platforms to view and print these files. Microsoft® Word (or a compatible word processing application) is required for preparing assignments – it is available on computers in the Mason open labs.

Online sections will use several tools through [the Blackboard course management system](#). Students are responsible for obtaining Internet access and a compatible platform. Appropriate computers are available on campus in open labs.

## **Privacy**

Instructors respect and protect the privacy of information related to individual students.

As described above, issues relating to an individual student will be discussed via email, telephone or in person. Instructors will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student.

Homework, quizzes, mid-term exams and other assessable work will be returned to individual students directly by the Instructor (or by a faculty member, staff member, or Teaching Assistant designated by the Instructor, or via another secure method). Under no circumstances will a student's graded work be returned to another student.

Instructors, staff, and Teaching Assistants will take care to protect the privacy of each student's scores and grades.

## **Disability Accommodations**

[Disability Services](#) works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with Disability Services as soon as possible and take advantage of the services offered.

Accommodations for disabled students *must* be made in advance – Disability Services cannot assist students retroactively. Any student who needs accommodation should contact the Instructor no later than the first class.

## **Campus Notifications**

Students are encouraged to subscribe to the [Mason Alert system](#) to receive notifications of campus emergencies, closings, and other situations that could affect class activities.

Each classroom has a poster explaining actions to be taken in different types of crisis. Further information on emergency procedures is available at the [Emergency Management](#) Web site. In the event of a possible emergency, students are encouraged to dial 911.

## **Other Resources**

Mason provides many useful resources for students.

The following resources may be particularly useful:

- The Writing Center
- The Academic Advising Center
- The University Libraries
- Counseling and Psychological Services
- University Career Services

See <http://www.gmu.edu/resources/students/> for a complete listing of Mason resources for students.

## **Academic Integrity**

All members of the Mason community are expected to uphold the principles of scholarly ethics.

The IT major has been designed to achieve several specific outcomes. One of those outcomes is: *“An understanding of professional, ethical, legal, security, and social issues and responsibilities.”*

Graduating students are bound by the ethical requirements of the professional communities they join. The ethics requirements for some of the communities relevant to IT graduates are available via the following links:

- [ACM Code of Ethics and Professional Conduct](#)
- [IEEE Code of Ethics](#)

– [EC-Council Code of Ethics](#)

On admission to Mason, students agree to comply with the requirements of [The Mason Honor Code](#). The Honor Code will be **strictly enforced** in this course. Honor Code cases are heard by a panel of students – students who meet the requirements are encouraged to nominate themselves to serve on the Honor Committee.

Any use of the words or ideas of another person(s), without explicit attribution that clearly identifies the material used and its source in an appropriate manner, is **plagiarism** and will not be tolerated. The Instructor reserves the right to use manual and/or automated means (including such services as [SafeAssign](#)) to detect plagiarism in any work submitted by students for this course, and to direct Teaching Assistants and/or other faculty and/or staff members to do likewise in support of this course.

For this course, the following requirements are specified:

- All assessable work is to be prepared by the individual student, unless the Instructor explicitly directs otherwise.
- All work must be newly created by the individual student for this course for this semester. Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the Instructor.

Students may seek assistance with assigned work (and are encouraged to do so if they feel the need), **provided:**

- The directions for the assigned work do not prohibit such assistance.
- Such assistance is **explicitly acknowledged** in the submitted work, clearly identifying the person(s) giving assistance and the nature of the assistance given.
- Any work to be submitted is prepared entirely and exclusively by the student submitting it. Students are expressly prohibited from sharing any assessable work for this course in any manner with other students (except students assigned as Teaching Assistants or Undergraduate Peer Mentors to this course and the student's section), unless all students involved have had their work graded and returned by the Instructor, or the Instructor has explicitly approved such sharing.

Another aspect of academic integrity is the free exchange of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. Please see the [Mason Diversity Statement](#) for more information on this topic.

Students are encouraged to ask for clarification of any issues related to academic integrity and to seek guidance from the Instructor, other faculty members, academic advisors, or the [Office for Academic Integrity](#).