Department of Information Sciences and Technology

Volgenau School of Engineering

IT 353 Information Defense Technologies
Spring 2021

Common Syllabus

revised 12/22/2020

This syllabus contains information common to all sections of IT 353 for the Spring 2021 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

Section	Instructor	Campus	Day	Time
001	Prof. Lyons	Online		
DL1	Prof. McCallam			
DL2				

Sections 001, DL1, and DL2 will operate as a single combined section except for recordkeeping within PatriotWeb.

Access to Blackboard will be made available no later than the day of the first class.

Course Description

From the University Catalog:

> **IT 353: *Information Defense Technologies.*** 3 credits.
>
> 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. Notes: For INFT and AIT majors, minors and certificates, and BAS cybersecurity concentration only. Offered by Info Sciences & Technology. Limited to two attempts.
>
> **Registration Restrictions:**
>
> **Required Prerequisites:** (IT 101 or 105[C]) and (IT 223[B]).
> [C] Requires minimum grade of C.
> [B] Requires minimum grade of B.
>
> Enrollment is limited to students with a major, minor, or concentration in Applied Information Technology, Applied Science, Individualized Study, Information Technology or Infmtn Tchngy Entrepreneurship.
>
> Students with the terminated from VSE major attribute may **not** enroll.
>
> **Schedule Type:** Lecture
>
> **Grading:**
> This course is graded on the Undergraduate Regular scale.

Prerequisites

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 enrolled in the course who has not met the prerequisite requirements (or received a waiver) by the start of the semester will be dropped from the course and the student will be responsible for any consequences of being dropped.

Rationale

This course is intended to prepare students for careers in homeland security, the military, and the defense industry, 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.

Supported Student Outcomes at the Program Level

This course supports the following student outcomes of the IT major:

3. The ability to communicate effectively in a variety of professional contexts.
4. The ability to recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. The ability to function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. The ability to identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing-based systems.

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.

Course Applicability

IT 353 is an option in the Cyber Security (CYBR) concentration
of the Bachelor of Science in Information Technology,
and an option in the Cyber Security (CYBS) concentration
of the Bachelor of Applied Science,
and a Technical Focus Course
in the Information Technology Minor
and the Information Technology Undergraduate Certificate.

Faculty and Staff

Course Coordinator:
Prof. Lyons

Instructors:
See **Scheduled Sections** above.
See links to faculty home pages for information on office hours, contact preferences, etc.

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
Phone: 703-993-3565

References

Textbooks

There is no required textbook for this course.

Grading

Grades will be awarded in accordance with the Mason Grading System for undergraduate students. See 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-	*Passing**
60 - 69%	D	*Passing**
0 - 59%	F	**Failing**

* Grades of "C-" and "D" are considered passing grades for undergraduate courses, but those grades may not be applicable as prerequisite grades or towards graduation, depending on the program and the Catalog Year. See the University Catalog for more information.

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

Final grades will be determined based on the following components:

Lecture reviews	10%
Assignments	15%
Project	25%
Mid-term exam	25%
Final exam	25%

These components are outlined in the following sections.

Lecture reviews

Students will submit online responses as directed to show their comprehension of lecture content.

Assignments

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

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 exam will be held online.
The date and time will be announced in Blackboard.
Students will receive feedback on the grading of their exams.

Final exam

The final exam will be held online.
The date and time will be announced in Blackboard.
Students will **not** receive feedback on the grading of their exams.

Please note that exams may be re-scheduled 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***.

There are **no** opportunities for "extra credit" in this course.
All students will be given the same opportunities to complete assigned work.

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. Exceptions to the submission time requirement may be made at the sole discretion of the Instructor.

A student with an exam conflict (or other circumstance that would justify rescheduling an exam under Mason policy), must notify the Instructor **no later than 2 weeks prior to the scheduled exam**. A student in an online section who wishes to take a proctored exam at another location must notify the Instructor **no later than 3 weeks prior to the scheduled exam** and the student will be responsible for making appropriate arrangements in accordance with Mason Policy 3004.

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.

Schedule

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

Important Dates

Please see the Spring 2021 Academic Calendar 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 will conflict with a scheduled course activity must notify the Instructor ***at least 2 weeks in advance*** in order to make alternative arrangements.

Lecture	Content
1	Introductions; Logistics; Course Overview Basic concepts: information, defense, technology; national security; cyberspace History of war, levels of war, the strategic environment, instruments of national power Project overview
2	Offset strategies Asymmetric warfare, network-centric warfare Ethics and law in warfare; Rules of engagement
3	Information operations, information warfare; IO targets; offensive IO Perception management, OPSEC, PSYOPS, military deception
4	C^4ISTAR
5	Cyberwarfare; case study *Review for mid-term exam*
6	***Mid-term exam*** The OODA loop
7	Space warfare
8	Space warfare *(continued)*
9	Space warfare *(continued)*
10	Robotics, unmanned vehicles
11	Video and discussion
12	Emerging technologies
13	Guest lecture
14	Project team presentations Review for final exam
–	**Final exam**

Attendance Policy

Students are expected to complete any required preparatory work (including assigned reading – see **Schedule** above), and to join each online lecture session in real time and/or to promptly review the recording of the session such that they see the entire lecture no later than the end of the day following the day of the lecture.

Mason policy AP.3.10 requires students to take exams at the scheduled time and place, unless prior approval is granted by the student's academic dean or director. An unexcused absence from an 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***.

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.

Classroom conduct

Students are expected to use the online tools provided solely for learning in relation to this course. Misuse of online tools may result in denial of access to those tools or other consequences under Mason policies.

Communications

Registered students will be given access to a Blackboard section for this course. Blackboard will 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. ***Students are advised to use Blackboard, Tools, Send Email, Select Users to originate email messages to an Instructor.***

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 Blackboard. 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. For information on student rights and privacy under the Family Educational Rights and Privacy Act of 1974 (FERPA) please see FERPA at Mason .

As described above, issues relating to an individual student will be discussed via email, telephone or in person. Instructors will not disclose protected information identifiable 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 each individual student 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, Teaching Assistants, and staff will take care to protect the privacy of each student's scores and grades.

Academic Integrity

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

The IT major bas 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 and System. 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 individual work to be submitted is prepared entirely and exclusively by the student submitting it. Students are expressly prohibited from sharing any individual 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. When using online tools to communicate, students are expected to follow the conventions of Netiquette. Mason values diversity: through the Office of Diversity, Inclusion, and Multicultural Education (ODIME), Mason seeks to create and sustain inclusive learning environments where all are welcomed, valued, and supported.

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.

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.

If a student has an accommodation that allows the student to take an exam in the Disability Services Testing Center, the Instructor will determine the date and time of that exam – the student ***must not*** contact Disability Services to schedule the exam until the Instructor has advised the date and time.

Other Resources

Mason provides many useful resources for students – see Students - George Mason University.
The following resources may be particularly useful:

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

Students in online sections may benefit from these resources:

- Online Learning Resources
- University Libraries - Mason Online