Catalog Description
This is a cross-listed course for both upper-level undergraduate students and graduate students on software security. This course provides a foundation for building secure software by applying security principles to the software development lifecycle. Students will learn the practical skills for developing and testing secure software. The focus is practical with discussions on why and how mechanisms ensure security, what level of security is provided, and how hostile adversaries might violate the mechanisms. Programming flaws, methods to avoid and correct flaws, and economic cost of software bugs are also addressed. We will also study how to perform software program analysis for identifying security vulnerabilities and defending security attacks.

Prerequisites
None

Rationale
This course covers the foundations of software security and principles of developing secure software.

Learning Objectives
Upon successful completion of this course the student will be able to understand: (a) software security fundamentals; (b) how to develop secure coding; (c) software risk management; (d) penetration testing; and (e) program analysis for improving software security.

Textbooks

Instructor and Staff
Instructor: Dr. Kun Sun
Email: ksun3@gmu.edu
Office Hours: MW 11:00pm - noon and by appointment, Research Hall, #421

CYSE 411 TA: Pranav Veldurthy
Email: pveldurt@masonlive.gmu.edu
Office Hours: TBA.

AIT 681 TA: Omoche (Cheche) Oagada
Email: oagada@masonlive.gmu.edu
Office Hours: Tuesday 5-6pm, Engineering Building Room 5503.

Administrative support: Julija Shimkute
Email: jshimkut@gmu.edu
Phone: 703-993-3565

**Grading Policy**

Final averages are assigned a letter grade according to the following ranges:

- [95-100] A+
- [90-95) A
- [85-90] A-
- [80-85) B+
- [75-80) B
- [70-75) B-
- [65-70) C+
- [60-65) C
- below 60 F

The final grades will be determined based on the following components.

<table>
<thead>
<tr>
<th>Course</th>
<th>2 Homework</th>
<th>Mid term exam</th>
<th>Final exam</th>
<th>Term project</th>
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</thead>
<tbody>
<tr>
<td>CYSE 411</td>
<td>20%</td>
<td>20%</td>
<td>30%</td>
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<tr>
<td>AIT 681</td>
<td>10%</td>
<td>20%</td>
<td>30%</td>
<td>40%</td>
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**Course Outline**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Topic 1. Introduction</td>
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<td></td>
<td>Topic 2. Software Security Fundamentals</td>
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### Important Dates

Dates for adding, dropping the course, etc. are available via: [https://registrar.gmu.edu](https://registrar.gmu.edu)

### Religious Holidays

A list of religious holidays is available on the University Life Calendar. Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor at least 2 modules in advance of the conflict date in order to make alternative arrangements.

### Attendance Policy

Students are expected to attend each class, to complete any required preparatory work (including assigned reading) 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 feasible if they miss any class without notice due to an emergency.

Departmental policy requires students to take exams at the scheduled time and place, unless there are truly compelling circumstances supported by appropriate documentation. Except in such circumstances, failure to arrive to the exam site on time for a scheduled exam will result in a score of zero (0) for that exam, in accordance with Mason policy on final exams. Students should not make travel plans or other discretionary arrangements that conflict with scheduled classes and/or exams. If the University is closed due to weather or other unforeseen conditions, final exams may be rescheduled – students are strongly advised not to make plans that would prevent them from attending exams that may be rescheduled during the entire exam period.

Classroom conduct
In order to keep an environment conducive to learning, disruptions should be kept at a minimum while attending a course session. Social discussions and electronic devices are potential distractions while attending a course session. Cell phones, pagers and other handheld devices should be turned off or set to ‘silent’ mode and not used while in the session. Personal computers can be used if university computers are not provided. University computers are to be used only if such use is directly related to the course activity in progress. For some activities the Instructor may ask that computers/devices not be used in order to maximize student engagement. Except through prior arrangement with the Instructor and the Office of Disability Services [ODS], any form of new recording of the course lecture is not allowed, except by the Instructor.

Communications
Communication on issues relating to the individual student should be conducted using email or telephone. Email is the preferred method. Email messages from the Instructor to all class members will be sent to students' GMU email addresses – if you use another email account as your primary address, you should forward your GMU email to that account.

Privacy
The Instructor will not discuss issues relating to an individual student with anyone lacking a need to know without prior written permission of the student. This includes a student's family members and other students. 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
The Office of Disability Services (ODS) works with students with disabilities 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 ODS as soon as possible and take advantage of the services offered. Accommodations for students
with disabilities must be made in advance as ODS cannot assist students retroactively. At least one week's notice is required for special accommodations related to examinations. Any student who needs accommodation should contact the Instructor during the first week of the semester so the sufficient time is allowed to make arrangements.

**Honor Code**

Students are required to be familiar and comply with the requirements of the GMU Honor Code [http://oai.gmu.edu/mason-honor-code/](http://oai.gmu.edu/mason-honor-code/). The Honor Code will be strictly enforced in this course. Collaboration is encouraged – students may consult each other and work collaboratively on any and all class endeavors.