



# COMP621 Web Security

Spring 2021

North Carolina Agricultural and Technical State University

College of Engineering Department of Computer Science

## Course Syllabus

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### Course Information

COMP621-001      CRN: 20029      3 credits

Lectures: Tuesdays at 2:00pm – 4:30pm remote learning, Zoom ID: 998 7286 8794

### Instructor Contact Information

Instructor      Dr. Kenneth A. Williams  
Cell Phone      336 456-5520  
Email Address      williams@ncat.edu

**Student Hours:** If you want to meet with the instructor via Zoom, send him an email or text to arrange a time. Unless the student desires a private meeting, all students in the class will be invited to the Zoom meeting.

**Communication:** Assignments and course material will appear on the University's online Blackboard system, <https://blackboard.ncat.edu>. Most assignments will be submitted through Blackboard. The web page <http://williams.comp.ncat.edu/comp621> may contain additional information. Email messages are sent to the student's A&T email address. It is the student's responsibility to regularly check their A&T email account. Students are responsible for reading, understanding, and following their syllabi.

**Course Pre-requisite:** Graduate student standing or undergraduate senior status

### Course Description

This course focuses on the technologies that provide security services for the World Wide Web. It introduces a set of procedures, practices, and technologies for protecting web servers, web users, and their surrounding organizations. We discuss, understand and use various security technologies for the World Wide Web (WWW). How to use these technologies to secure WWW applications will be addressed.

**Student Learning Objectives/Outcomes:** Upon completion of this course, the student should be able to:

- Design a secure web application      (*Graduate students only*)
- Secure a web application against attack from known vulnerabilities
- Perform penetration testing to detect common vulnerabilities
- Use existing tools to evaluate the network traffic created by a web application
- Analyze the effectiveness and security of HTTP security, proxy servers, electronic payment systems, and cryptographic techniques on the WWW

**Required Textbook:** *Web Application Security: Exploitation and Countermeasures for Modern Web Applications*, by Andrew Hoffman, 2020 ISBN: 9781492053118

**Grading Policy:** A student's grade in the class will be based on their performance on the exams, quizzes, programs and homework assignments as well as lecture attendance. All work will be graded on a numerical scale from 0 to 100. The final grade will be the weighted sum of all work using the following weights:

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assignments and quizzes	20 % combined
3 exams	20 % each
final exam	20 %

The lowest assignment or quiz grade will be discarded. Assignments must be turned in at the specified time and date for full credit, unless accompanied by a valid excuse. Assignments turned in within one day of the assigned time will be penalized 15%. Assignments turned in within two days of the assigned time will be penalized 25%. **No Assignments will be accepted after two days.** Students who are absent during a class period when a test is given, will receive a score of zero unless previous arrangements are made or a valid written excuse is presented. Student who miss an exam for a valid reason should see the instructor to arrange a makeup exam. There is no extra credit or special assignments.

Final letter grades will be based on the following scale:

Letter Grade	from	up to but not including
A	87	100
A-	85	87
B+	82	85
B	77	82
B-	75	77
C+	72	75
C	62	72
C-	60	62
D+	57	60
D	50	57
F	0	50 or 62

The final exam will be optional for a student when it is determined by the instructor that it is statistically unlikely that the final exam will change the student's grade. A student always has the option to take the final exam if they wish to do so. When a student is permitted to not take the final exam, their course grade will be determined by the weighted average of all other graded work.

**Class Attendance:** The lectures introduce the class material. Some material presented in the lectures is not covered in the text. Students are responsible for all class material covered or assigned in lectures. Students are not required to attend the Zoom lectures. Attendance during any exam or quiz is required.

**Classroom Citizenship:** Courtesy, civility and respect must be the hallmark of your interactions. North Carolina A&T State University has rules and regulations that govern student conduct and discipline meant to ensure the orderly and efficient conduct of the educational enterprise. It is the responsibility of each student to be knowledgeable about these rules and regulations. Please see the relevant links below.

**Compliance with the Americans with Disabilities Act** North Carolina A&T State University (N.C. A&T) is committed to following the requirements of the Americans with Disabilities Act Amendments Act (ADAAA) and Section 504 of the Rehabilitation Act.

If you need an academic accommodation based on the impact of a disability, you must initiate the request with the Office of Accessibility Resources (OARS) and provide documentation in accordance with the Documentation Guidelines at N.C. A&T. Once documentation is received, it will be reviewed. Once approved, you must attend a comprehensive meeting to receive appropriate and reasonable

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accommodations. If you are a student registered with OARS, you must complete the Accommodation Request Form to have accommodations sent to faculty.

OARS is located in Murphy Hall, Suite 01 and can be reached at 336-334-7765, or by email at [accessibilityresources@ncat.edu](mailto:accessibilityresources@ncat.edu) Additional information and forms can be found on the internet at <https://www.ncat.edu/provost/academic-affairs/accessibility-resources/index.php>

### ***Title IX***

North Carolina A&T State University is committed to providing a safe learning environment for all students—free of all forms of discrimination and harassment. Sexual misconduct and relationship violence in any form are inconsistent with the university’s mission and core values, violate university policies, and may also violate federal and state law. Faculty members are considered “Responsible Employees” and are required to report incidents of sexual misconduct and relationship violence to the Title IX Coordinator. If you or someone you know has been impacted by sexual harassment, sexual assault, dating or domestic violence, or stalking, please visit the Title IX website to access information about university support and resources <https://www.ncat.edu/legal/title-ix/index.php>. If you would like to speak with someone confidentially, please contact the Counseling Services at 336-334-7727 or the Student Health Center at 336-334-7880.

### ***Technical Support***

If you experience any problems with your N.C. A&T account, you may call Client Technology Services (formerly Aggie Tech Support and Help Desk) at 336-334-7195, or visit <https://hub.ncat.edu/administration/its/dept/ats/index.php>

***Student Affairs website*** <https://www.ncat.edu/campus-life/student-affairs/index.php>

***Student Handbook:*** <https://www.ncat.edu/campus-life/student-affairs/departments/dean-of-students/student-handbook.php>

***Sexual Misconduct Policy*** <https://www.ncat.edu/legal/title-ix/sexual-harassment-and-misconduct-policies/index.php>

***Family Educational Rights and Privacy Act*** <https://www.ncat.edu/registrar/ferpa.php>

***Student Complaint Procedures:*** <https://www.ncat.edu/current-students/student-complaint-form.php>

***Undergraduate Bulletin:*** <https://www.ncat.edu/provost/academic-affairs/bulletins/index.php>

***Graduate Catalog:*** <https://www.ncat.edu/tgc/graduate-catalog/index.php>

### ***STUDENT CONDUCT AND DISCIPLINE***

North Carolina A&T State University has rules and regulations that govern student conduct and discipline meant to ensure the orderly and efficient conduct of the educational enterprise. It is the responsibility of each student to be knowledgeable about these rules and regulations.

Please consult the following about specific policies such as academic dishonesty, cell phones, change of grade, disability services, disruptive behavior, general class attendance, grade appeal, incomplete grades, make up work, student grievance procedures, withdrawal, etc.

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**Academic Dishonesty Policy:** Instances of cheating will be handled according to College of Engineering policy. Academic integrity is critical to maintaining high standards within the academic community. All students enrolled in the College of Engineering are expected to demonstrate academic integrity when submitting course-related work (e.g., assignments, quizzes, individual projects, and exams). Academic dishonesty includes but is not limited to the following:

1. Cheating or knowingly assisting another student in committing an act of cheating or other academic dishonesty;
2. Plagiarism (unauthorized use of another's words or ideas as one's own), which includes but is not limited to submitting exams, theses, reports, drawings, laboratory notes or other materials as one's own work when such work has been prepared by or copied from another person;
3. Unauthorized possession of exams or reserved library materials; destroying or hiding source, library or laboratory materials or experiments or any other similar actions;
4. Unauthorized changing of grades, or marking on an exam or in an instructor's grade book or such change of any grade record;
5. Aiding or abetting in the infraction of any of the provisions anticipated under the general standards of student conduct;
6. Hacking into a computer and gaining access to a test or answer key prior to the test being given. N.C. A&T reserves the right to search the emails and computers of any student suspected of such computer hacking if a police report of the suspected hacking was submitted prior to the search; and
7. Assisting another student in violating any of the above rules.

Students are expected to submit assignments that are entirely their own work. A common example of cheating is to copy another person's program or homework assignment.

A student who has committed an act of academic dishonesty has failed to meet a basic requirement of satisfactory academic performance. Thus, academic dishonesty is not only a basis for disciplinary action but may also affect the evaluation of a student's level of performance. Any student who commits an act of academic dishonesty is subject to disciplinary action.

If a student cheats on a homework or programming assignment, then he/she will receive a grade of zero (a grade of F) for that item as will anyone assisting him/her in an unauthorized way. If a student cheats on an exam or the final or cheats more than once on an assignment, the violation will be reported to the College of Engineering Academic Integrity Committee with the recommendation of a grade of 'F' for the course, subject to the review and endorsement of the chairperson and the dean. All cases of cheating will be reported to the Director of Undergraduate Studies or the Director of Graduate Studies.

Repeated academic integrity violations may lead to dismissal from the University. To review the University's Academic Dishonesty Policy, please see section IV.F of the Student Handbook,

<https://www.ncat.edu/files/pdfs/campus-life/student-handbook.pdf>

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## Class Schedule

Tuesday, January 26 Introduction read chapter 1	
Tuesday, February 2 Web application structure read 2	
Tuesday, February 9 Web debugging read chapter 3	
Tuesday, February 16 Recon read chapters 4-8	
Tuesday, February 23 Cross-site Scripting (XSS) read chapter 10	Exam 1
Tuesday, March 2 Cross-site Scripting (XSS) read chapter 22	
Tuesday, March 9 Cross-Site Request Forgery read chapters 11 & 23	
Tuesday, March 16 XML External Entities (XXE) read chapters 12	
Tuesday, March 23 XML External Entities (XXE) read chapters 24	Exam 2
Tuesday, March 30 SQL Injection read chapter 13	
Tuesday, April 6 Injection read chapter 25	
Tuesday, April 13 Denial of Service (DoS) read chapters 14 & 26	
Tuesday, April 20 Open Source components read chapters 15 & 27	Exam 3
Tuesday, April 27 Review read chapter 29	
Tuesday, May 4, 2:00pm <b>Final Exam</b>	

*The calendar is subject to change at the discretion of the Instructor.*