FLORIDA ATLANTIC UNIVERSITY

COURSE CHANGE REQUEST
Graduate Programs

Department Electrical Engineering and Computer Science

College Engineering and Computer Science

UGPC Approval _____
UFS Approval _____
SCNS Submittal _____
Confirmed _____
Banner _____
Catalog _____

***Current* Course Prefix and Number** CTS 6319

***Current* Course Title** Cyber Security: Measurement and Data Analysis

*Syllabus must be attached for **ANY** changes to current course details. See Template. Please consult and list departments that may be affected by the changes; attach documentation.*

Change title to:
Data Analysis and Modeling for Cybersecurity

Change prefix

From: CTS **To:** CAP

Change course number

From: 6319 **To:** 6345

Change credits*

From: **To:**

Change grading

From: **To:**

Academic Service Learning (ASL) **

Add ☐ **Remove** ☐

* See Definition of a Credit Hour.
** Academic Service Learning statement must be indicated in syllabus and approval attached to this form.

Change description to:

Change prerequisites/minimum grades to:

Change corequisites to:

Change registration controls to:

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade.

Effective Term/Year for Changes: Summer 2024

Terminate course? Effective Term/Year for Termination:

Faculty Contact/Email/Phone Michael DeGiorgio / mdegiorg@fau.edu / 561-297-0003

Approved by		***Date***
Department Chair	Hani Kalva	2/20/2024
College Curriculum Chair	Masoud Jahandar Lashaki	2/20/2024
College Dean	M Cardei	3/4/2024
UGPC Chair		03/21/2024
UGC Chair		03/21/2024
Graduate College Dean		03/21/2024
UFS President		
Provost		

Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.

CAP 6345
Data Analysis and Modeling for Cybersecurity

3 credits

Semester, Year

Prof. XXXXX YYYYY
Office: XXXXXX
Office hours: DAY X-X
Classroom: XXXX
Telephone: 561-297-XXXX
Email: zzzzz@fau.edu

TA name	xxxxxx xxxxxxxxx
Office	xxxxxxxx
Office hours	DAY xx:xx – xx:xx
Telephone	561-297-xxxx
Email	xxxxxx@fau.edu

Course Description

This course introduces data science to the field of cyber security. Digital investigation approaches for cyber security will be discussed. Further, data analytics and traffic analysis methodologies will be presented. Data acquisition and sound analysis methods will also be elaborated. Approaches for inferring and attributing various types of cyber attacks will be presented.

Instructional Method

In-Person. There is no remote option for this course.

Prerequisites/Corequisites

Graduate standing or permission of instructor

Course Objectives/Student Learning Outcomes

1. Provide a background of networking concepts and how they can be leveraged in cyber security
2. Provide practical and sound methods for the acquisition and measurement of Internet traffic for cyber security
3. Demonstrate real corporate and Internet attacks
4. Compare and contrast probabilistic, statistical and heuristic approaches to infer and attribute cyber security attacks through traffic analysis
5. Provides practical techniques to geo-locate and report cyber security incidents

Students will come away with applicable skills in employing data science techniques to infer, characterize, attribute and provide evidence of Internet-scale cyber security incidents by analyzing network traffic.

Course Evaluation Method

Include a breakdown of the graded course components and their weight in determining the overall course grade (e.g. Midterm exam--20%, Essay #1--15%, Attendance and Participation--10%, etc.). Students are entitled to know how they are progressing in a course based on the individual grades received. If you have a policy about how unexcused class absences will affect the final grade, clearly state your policy. Please note that the University Provost, in order to identify and assist students at academic risk, requests that courses with freshmen have graded assignments well before midterm. If applicable, also note the minimum grade required to pass the course (if not a "D-").

Course Project 40%
Active participation and research interest 10%
Final Examination 50%

Course Grading Scale

Grade	Total (%)
A	[93 – 100]
A-	[90 – 92)
B+	[87 – 89)
B	[83 – 86)
B-	[80 – 82)
C+	[77 – 79)
C	[73 – 76)
C-	[70 – 72)
D+	[67 – 69)
D	[63 – 66)
D-	[60 – 62)
F	[0 – 59)

Policy on Makeup Tests, Late Work, and Incompletes (if applicable)

Late work will not be accepted. All assignments will be posted well in advance, and students may submit assignments early. Any assignment not turned in by the due date will result in a zero.

Incomplete grades are against the policy of the department, and they will only be assigned if there is solid evidence of medical or otherwise serious emergency situation.

Policy on the Recording of Lectures

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is

prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

Attendance Policy

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/

Disability Policy

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Required Texts/Readings

Cybersecurity and Cyberwar: What Everyone Needs to Know, by P.W. Singer and Allan Friedman, ISBN-10: 0199918090 1st Edition, 2014

Data Analysis for Network Cyber-Security, by Niall Adams and Nicholas Heard, ISBN: 978-1-78326-374-5, 2014

Communication Networks: Fundamental Concepts and Key Architectures, by Alberto Leon-Garcia , ISBN-10: 007246352X 2nd Edition, 2003

Course Topical Outline

Overview and logistics
TCP/IP
Internet measurement
Denial of service
Probing
Botnets
Network intrusion detection systems (NIDS)
NIDS issues
Spam
Censorship
Legality and Ethics
Underground Economy