UNIVERSITY OF GEORGIA

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University Council

April 15, 2022

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Dear Colleagues:

The attached proposal from the Franklin College of Arts and Sciences to offer a thesis track for the existing major in Cybersecurity and Privacy (M.S. Non-Thesis) will be an agenda item for the April 22, 2022, Full University Curriculum Committee meeting.

Sincerely,

Susan Sanchez, Chair
University Curriculum Committee

cc: Provost S. Jack Hu
Dr. Marisa Pagnattaro

Proposal to Offer the Major in Cybersecurity and Privacy (M.S.) with a Thesis Option

Date: September 21, 2021

College: Franklin College of Arts and Sciences

Department: Computer Science

Program: Cybersecurity and Privacy (M.S.)

Proposed Effective Term: Fall 2022

CIP: 11100301

Program Description:
Cybersecurity and Privacy (M.S.) is an advanced program of study that addresses all aspects of cybersecurity, privacy, and related technologies. It is intended for all students in the STEM-C fields, particularly in the fields of computer science, mathematics, and engineering. The program aims to develop expertise in various aspects of computer security and privacy, such as networking, operating systems, network and systems security, and data and communications privacy. Students in this program should be able to defend against common cybersecurity and privacy attacks by having knowledge of information security, including secure programming and known practices. Students will be able to use their enhanced and improved hands-on experiences and skills to address various security and privacy issues. Students should be able to make risk assessments of IT design decisions.

Justification:
The thesis track will require students to take CSCI 7000, Master's Research, and CSCI 7300, Master's Thesis, providing a combined 6-8 credit hours dedicated to cybersecurity and privacy research. This will allow students to gain significant research experience under the supervision of a Computer Science faculty whose research focuses primarily on cybersecurity and/or privacy topics. The expected outcome is that the new thesis track will prepare students to enter a Ph.D. program in cybersecurity and privacy or for career in industry research labs, for example.

Curriculum:
The total number of credit hours required to complete Cybersecurity and Privacy (M.S.) is 30 hours for both the non-thesis and the proposed thesis option. Below is a table comparing the currently approved non-thesis program of study and the proposed thesis program of study:

Non-Thesis (Existing)	Thesis (Proposed)
Required Courses (19-20 hours)	***Required Courses (22-24 hours)***
CSCI 6250, Cyber Security (4 hours)	CSCI 6250, Cyber Security (4 hours)
CSCI 6260, Data Security and Privacy (4 hours)	CSCI 6260, Data Security and Privacy (4 hours)
CSCI 6730, Operating Systems (4 hours)	CSCI 6730, Operating Systems (4 hours)
CSCI 6760, Computer Networks (4 hours)	CSCI 6760, Computer Networks (4 hours)
CSCI 7200, Master's Project (3-4 hours)	CSCI 7000, Master's Research (3-4 hours)
	CSCI 7300, Master's Thesis (3-4 hours)
Elective Courses (10-11 hours) ***Choose three of the following:***	***Elective Courses (6-8 hours)*** ***Choose two of the following:***
CSCI 6270, Introduction to Computer Forensics (4 hours)	CSCI 6270, Introduction to Computer Forensics (4 hours)
CSCI 8240, Software Security and Cyber Forensics (4 hours)	CSCI 8240, Software Security and Cyber Forensics (4 hours)
CSCI 8245, Secure Programming (4 hours)	CSCI 8245, Secure Programming (4 hours)
CSCI 8250, Advanced Cyber Security (4 hours)	CSCI 8250, Advanced Cyber Security (4 hours)
CSCI 8260, Computer Network Attacks and Defenses (4 hours)	CSCI 8260, Computer Network Attacks and Defenses (4 hours)
CSCI 8265, Trustworthy Machine Learning (4 hours)	CSCI 8265, Trustworthy Machine Learning (4 hours)
CSCI 8960, Privacy-Preserving Data Analytics (4 hours)	CSCI 8960, Privacy-Preserving Data Analytics (4 hours)
CSCI 8965, Internet of Things Security (4 hours)	CSCI 8965, Internet of Things Security (4 hours)
CSEE 8310, Security in Cyber-Physical Systems (3 hours)	CSEE 8310, Security in Cyber-Physical Systems (3 hours)
MATH 6540, Cryptology and Computational Number Theory (3 hours)	MATH 6540, Cryptology and Computational Number Theory (3 hours)
MIST 7775, Cyber Threat Intelligence (3 hours)	MIST 7775, Cyber Threat Intelligence (3 hours)

Admission:

Admissions requirements will mirror the approved non-thesis version of the major, and align with the current admissions standards set by the Graduate School and the Franklin College of Arts and Sciences. Completed applications will include the UGA graduate application, a bachelor's degree from a regionally accredited institution in Computer Science or a related discipline, three letters of recommendation, a statement of purpose, a minimum 3.0 GPA, and a GRE test score. Applicants must meet all Graduate School requirements.

Students with an insufficient background in Computer Science must first take undergraduate Computer Science courses to remedy any deficiencies in addition to their graduate program requirements. A sufficient background in Computer Science must include at least the following courses (or equivalents):

- CSCI 1301-1301L, Introduction to Computer and Programming
  (alternative option: CSCI 7010, Computer Programming)
- CSCI 1302, Software Development
- CSCI 1730, Systems Programming
- CSCI 2610, Discrete Mathematics for Computer Science
- CSCI 2670, Introduction to Theory of Computing
- CSCI 2720, Data Structures
- CSCI 4720, Computer Systems Architecture
- MATH 2200, Analytic Geometry and Calculus
- MATH 2250, Calculus I for Science and Engineering

Impact on Current Students:
Students already enrolled in the non-thesis track will be allowed to switch to the new thesis track with the requirement of taking CSCI 7000, Master's Research, and CSCI 7300, Master's Thesis, under the supervision of a Computer Science faculty whose research focuses primarily on cybersecurity and/or privacy topics. The total number of credit hours required to complete Cybersecurity and Privacy (M.S.) will remain the same for both the non-thesis and thesis options.

Impact on Faculty and Staff:
All faculty resources needed for the thesis track are pre-existing. The Computer Science department currently has seven faculty in cybersecurity and privacy, who will be teaching the core courses and serving as M.S. research and thesis advisors. No new administrative staff are needed. The administrative staff in the Computer Science Department will be able to handle the new load, and the new duties are already built in their job descriptions.

Assessment:
Course learning outcomes are evaluated on student performance in projects and exams as well as feedback collected from students through anonymous surveys. All academic programs are reviewed annually to assess the program outcomes and student learning outcomes. This major is also assessed every seven years as part of the UGA comprehensive program review.

Documentation of Approval and Notification

Proposal: Add a thesis track to the existing major in Cybersecurity and Privacy (M.S., Non-Thesis)

College: Franklin College of Arts and Sciences

Department: Computer Science

Proposed Effective Term: Fall 2022

Department:

- Computer Science Department Head, Dr. Thiab Taha, 12/13/2021

School/College:

- Franklin College of Arts and Sciences Associate Dean, Dr. Jean Martin-Williams, 4/12/22

Graduate School:

- Graduate School Associate Dean, Dr. Anne Shaffer, 4/7/22