



# **COMPUTER SCIENCE: INFO FOR INCOMING FIRST-YEAR STUDENTS**

<https://my.wlu.edu/computer-science-department>

# FIRST COURSES

## CSCI-111: Introduction to Computer Science

- Satisfies FDR FM
- Meant for majors, minors, potential majors/minors; elective for math majors and data science minors
- Offered in both fall and winter

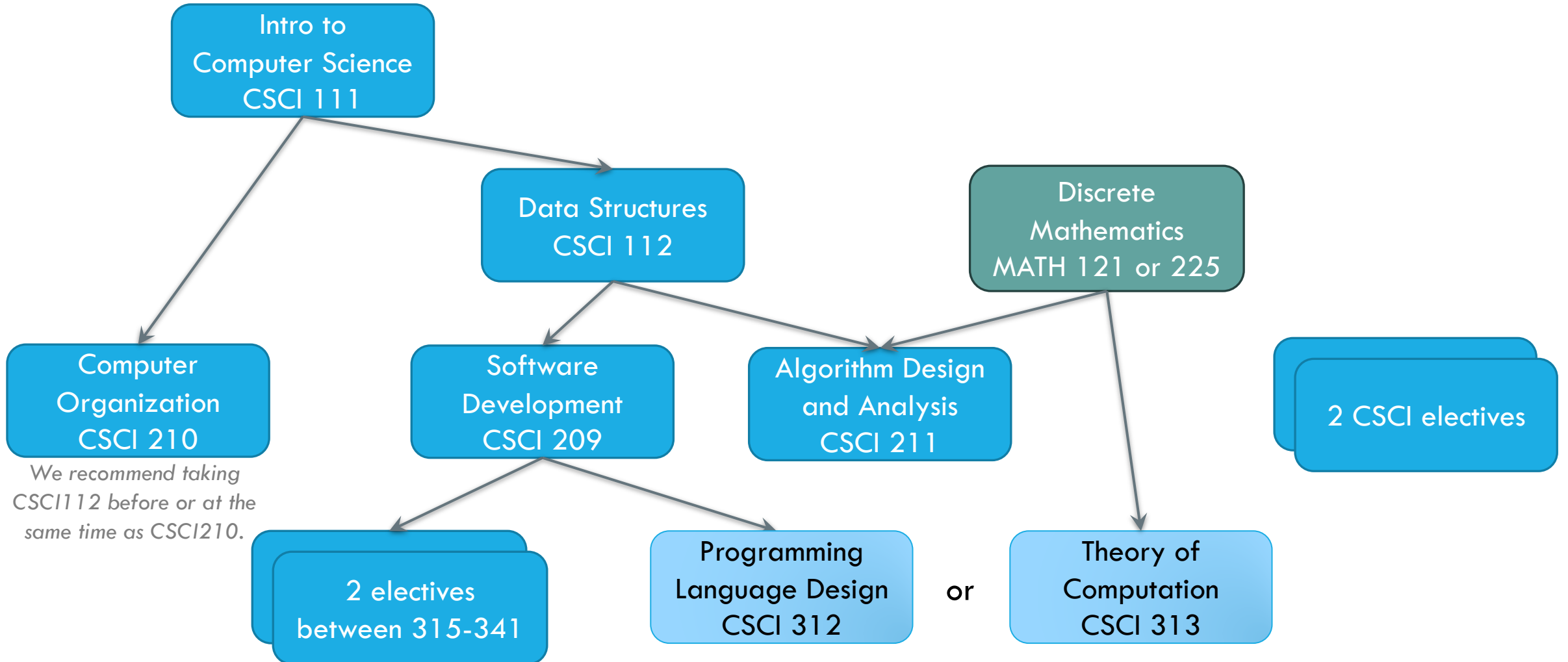
## CSCI-101: Survey of Computer Science

- Satisfies FDR FM
- Meant for non-majors or curious about computer science
- *Offered when resources allow*

# AP CREDIT

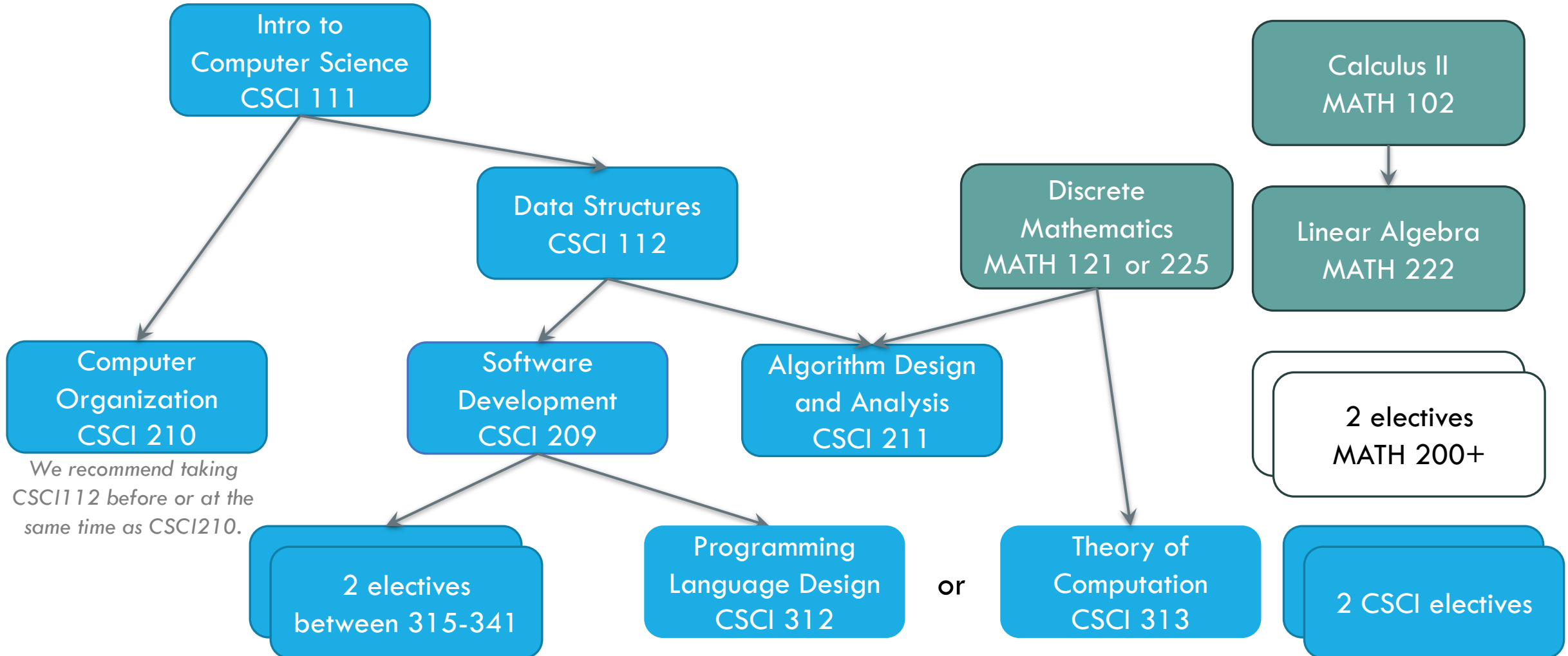
AP Test	AP Score	W&L equivalency and credit	Registration Recommendation
Computer Science A	5	CSCI 111 (4) FM	consider taking CSCI 112
Computer Science Principles	5	CSCI 101 (4) FM	consider taking CSCI 111

# FLOW OF COURSES FOR CSCI MAJOR, BA





# FLOW OF COURSES FOR CSCI MAJOR, BS



# RECENT 200-LEVEL ELECTIVES

A Walk Through the Ages

Machine Learning and Big Data

Generative Artificial Intelligence

Modeling and Simulation

Neuromorphic Computing

Robotics

Systems Programming

Each course is offered at most every other year.

# RECENT 300-LEVEL ELECTIVES

Artificial Intelligence

Advanced Robotics

Cloud Computing

Computer Graphics

Computer Networks

Database Systems

Human-Computer Interaction

Computer and Network Security

Parallel Computing

Reinforcement Learning

Software Tools

Software Engineering through

Web Applications

Video Game Design

Each course is offered at most every other year.

# EXAMPLE SCHEDULE FOR BA STARTING FALL FIRST-YEAR

Year	Fall	Winter	Spring
First Year	CS 111	CS 112	
Sophomore	CS 209	CS 210 Math 121 (or Math 225 in fall)	
Junior	Math 225 (or Math 121 in winter) Elective 1	CS 211 Elective 2	
Senior	CS 313 (or CS 312 in winter) Elective 3	CS 312 (or CS 313 in fall) Elective 4	

<https://my.wlu.edu/computer-science-department/about-the-department/typical-schedules-for-majors>

# EXAMPLE SCHEDULE FOR BA STARTING WINTER FIRST-YEAR

Year	Fall	Winter	Spring
<b>First Year</b>		CS 111	
<b>Sophomore</b>	CS 112	CS 210 MATH 121 (or Math 225 in fall)	
<b>Junior</b>	CS 209 Math 225 (or Math 121 in winter)	CS 211 Elective 1	Elective 2
<b>Senior</b>	CS 313 (or CS 312 in winter) Elective 3	CS 312 (or CS 313 in fall) Elective 4	

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# EXAMPLE SCHEDULE FOR BA STARTING FALL SOPHOMORE YEAR

Year	Fall	Winter	Spring
First Year			
Sophomore	CS 111	CS 112 MATH 121 (or Math 225 in fall)	
Junior	CS 209 Math 225 (or Math 121 in winter)	CS 210 CS 211	Elective 1
Senior	CS 313 (or CS 312 in winter) Elective 2	CS 312 (or CS 313 in fall) Elective 3	Elective 4

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# EXAMPLE SCHEDULE FOR BA STARTING WINTER SOPHOMORE YEAR

Year	Fall	Winter	Spring
<b>First Year</b>			
<b>Sophomore</b>		CS 111 MATH 121 (or Math 225 in fall)	
<b>Junior</b>	CS 112 Math 225 (or Math 121 in winter)	CS 210 CS 211	Elective 1
<b>Senior</b>	CS 209 CS 313 (or CS 312 in winter) Elective 2	CS 312 (or CS 313 in fall) Elective 3	Elective 4

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# SHOULD I PURSUE THE BA OR THE BS?

## BA

Fewer required courses

More flexible for students with double majors or minor(s)

- Students have more electives

## BS

More theoretical and mathematical emphasis

- Good for math majors/minors, data science minors; interested in graphics, AI

1 more computer science course and 4 additional math courses than BA

Takeaway: Either degree will satisfy job requirements, even if job ad specifies "BS".

Many top liberal arts colleges don't offer a BS in computer science, and their students still get jobs.



# COMPUTER SCIENCE MINOR

6 courses; 4 are electives

CSCI 111, CSCI 112

One additional CSCI course at the 100 level or *higher*

- May satisfy by taking CSCI-101 if taken before any other CSCI course
- Most satisfy with a 200-level course

Two additional CSCI courses at the 200 level or *higher*

- Many minors take CSCI-209 because it is the main gateway to the 300-level courses

One additional CSCI course at the 300 level or *higher*

# WHAT IS COMPUTER SCIENCE VS DATA SCIENCE?

## Computer Science

Study of computation:  
how to effectively and efficiently  
create software-based solutions to  
problems

- Examples: automation, data analysis, entertainment, study of software development itself, design and analysis of algorithms to meet an objective

Broader scope

## Data Science

Extracting knowledge and insights  
from noisy, structured, and  
unstructured data through a  
variety of mathematical and  
modeling methods

Focus on discovering information  
from data and understanding the  
pros and cons of certain objectives

# FIRST JOBS AFTER GRADUATION

## Graduate and Law School

- **Taylor Tucker '23** - Master's in data science, UVA, while teaching computer science as a Kenan-Lewis Fellow at Woodberry Forest School
- **Joe Salerno '22** - Graduate program in Entrepreneurship/Innovation at NYU
- **Laurie Jones '21** - Ph.D. program in information science at University of Colorado, Boulder
- **Hammad Ahmad '19** - Ph.D. program in computer science at University of Michigan
- **Julianne Campbell '18** - Law School, Vanderbilt University

## Software Developers/Engineers

- **Maddie Clubb '23** - Software Engineering Technology Development Program, GEICO
- **Sam Bluestone '22** - Software Engineer, Red Ventures
- **Alyssa Vu '22** - Software Engineer, Microsoft
- **Rinn Joireman '21** - Software Development Engineer, Amazon
- **George Barker '20** - Software Engineer, FedEx
- **Liam McCann '20** - Associate Software Engineer, The Johns Hopkins University Applied Physics Lab

# FIRST JOBS AFTER GRADUATION

## Consultants & Contractors

- **Jae Jung '22** – Technology Risk Consultant, EY
- **Scott Walters '22** – Digital Transformation Consultant, NTT Data
- **Zachary Francis '20** - Information Technology Security Consultant, Freddie Mac
- **Emily Roche '20** - Federal Consultant, IBM's Cloud Application Systems

## Analysts & Data Scientists

- **Dan Nguyen '23** - Investment banking analyst, Jefferies
- **Haochen Tu '22** – Investment Analyst, Makena Capital Management
- **Alexander Caines '21** – Data Scientist, Allstate
- **Lex McGriff '18** - Technology Analyst, Citi
- **Will McMurtry '18** - Data Scientist, JPMorgan Chase

## Client/Human-Focused Positions

- **Dario Fumarola '23** - Associate Solutions Architect, AWS
- **Laurie Lee '22** - Technical Writer, Salesforce
- **Logan Brand '20** – Technical Account Manager, Microsoft
- **Alex Wagner '21** - Associate digital designer, Red Ventures

# FACULTY RESEARCH



## Taha Khan

security, privacy, human-computer interaction (HCI)

His research goal is to make the Internet more secure, robust, and usable. He develops privacy-centric tools for information management in the cloud and studies online security tools, such as VPNs, as well as cybercrime.



## Simon Levy

robotics, cognitive science, natural language

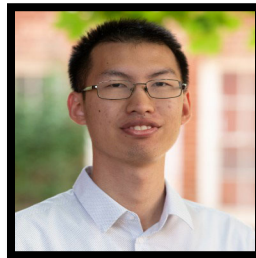
He has interests that include robotics, neuromorphic computing, philosophy of mind, and the relationships among these topics. He enjoys writing software libraries to support research and teaching in these areas.



## Liz Matthews

video game design, human-centered computing (HCC)

She conducts research in video game design, human-centered computing, user studies, and measuring enjoyment in digital media. Recent projects study procedural generation and its effect on game enjoyment.



## Kefu Lu

parallel computing, machine-learning algorithms

His research focuses on parallel computing, machine learning algorithms, and large-scale data analytics. He develops data clustering algorithms for parallel and distributed computing systems.



## Sara Sprenkle

software testing, web applications, empirical studies

Her research focuses on automated testing of web applications, including cost-effective approaches to generating test cases and determining that the application is correct.



## Cody Watson

deep learning in software engineering, software 2.0

He investigates deep learning in software engineering and the progression of software 2.0. He focuses on the interdisciplinary uses of deep learning as well as protections against deep learning adversarial attacks.

## Research Topics:

- ✓ **Algorithmic Theory:** Lu
- ✓ **Deep Learning:** Lu, Watson
- ✓ **Education:** Sprenkle
- ✓ **HCC, HCI:** Khan, Matthews
- ✓ **Machine Learning:** Lu, Watson

- ✓ **Natural Language Processing:** Levy
- ✓ **Procedural Generation:** Matthews
- ✓ **Robotics:** Levy
- ✓ **Security and Privacy:** Khan

- ✓ **Software Engineering:** Sprenkle, Watson
- ✓ **Software Testing:** Sprenkle, Watson
- ✓ **Video Games:** Matthews
- ✓ **Web Applications:** Sprenkle





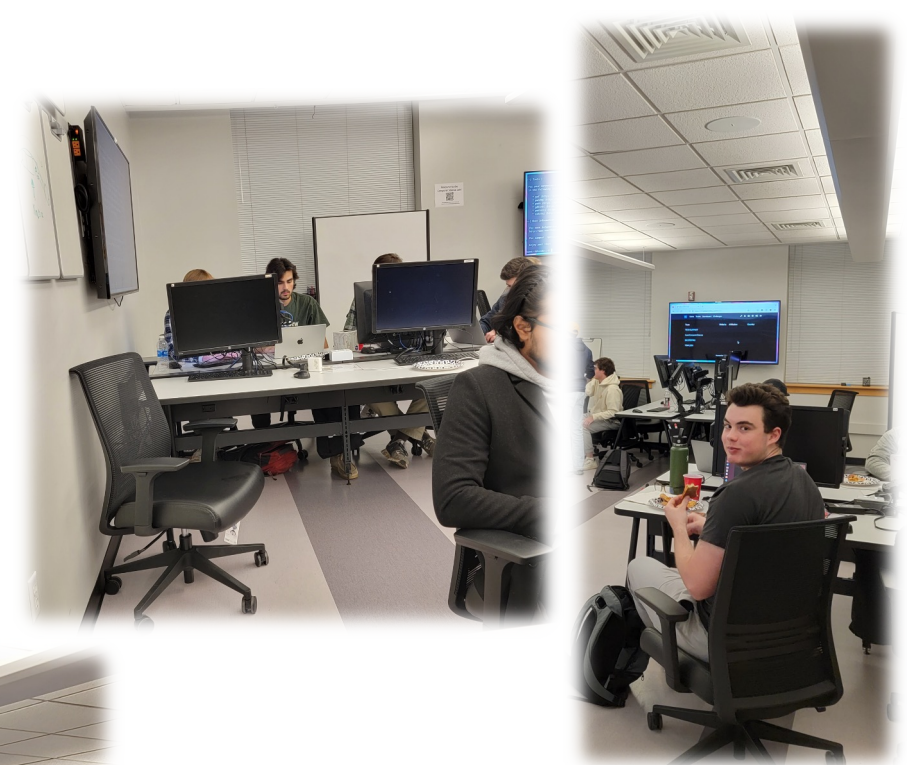
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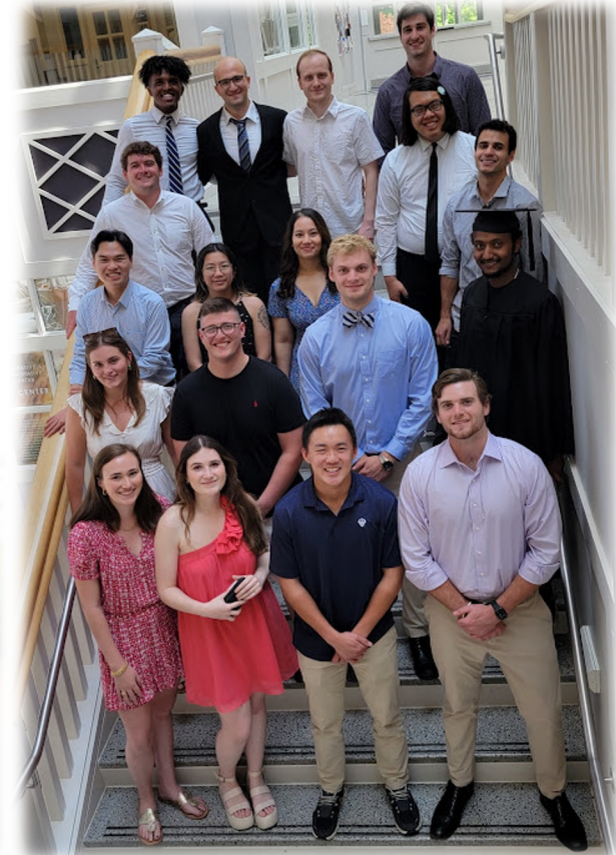
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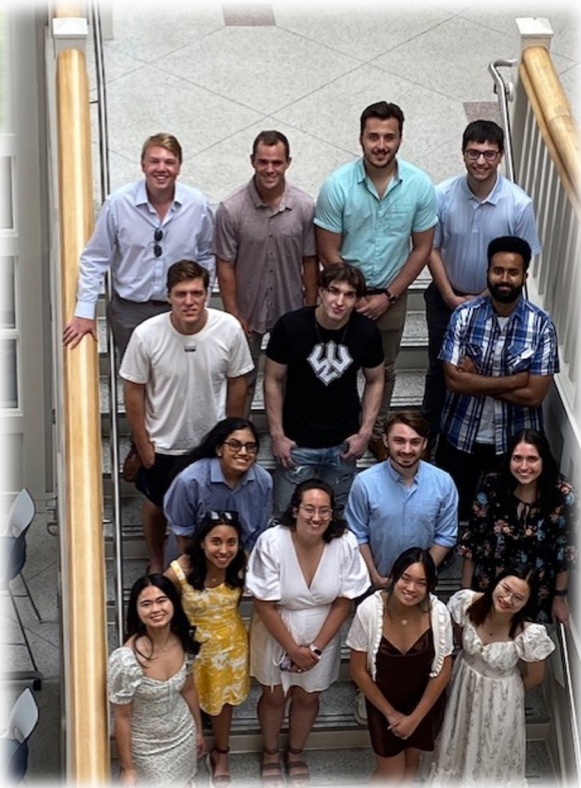
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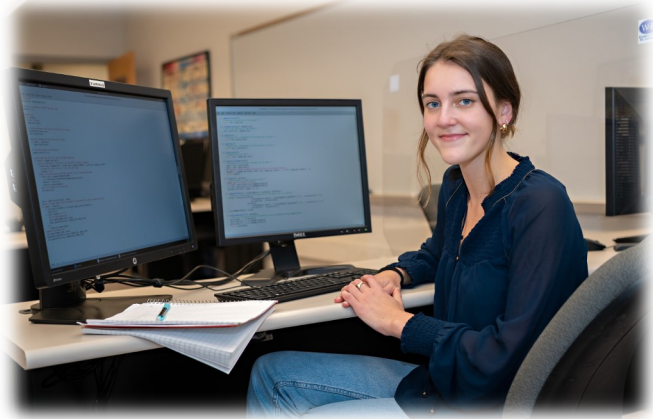
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