

Department of Computer Science and Information Technology

Department of Mathematics and Statistics

Master of Science (M.S.), Professional Science Master's (PSM)

Information Sheet – **Effective Fall 2021 Semester**

The Department of Computer Science and Information Technology and the Department of Mathematics and Statistics offer a **Master of Science (M.S.)** degree in Computer Science and Quantitative Methods, and a **Professional Science Master's (PSM)** degree, also in Computer Science and Quantitative Methods. There are nine areas of study (concentrations) available.

Online | On-Campus | Mix of Online & On-Campus

- **M.S. in Computer Science and Quantitative Methods (MS CSqm)**
 - DATA SCIENCE: Data Management and Analysis Concentration
 - PREDICTIVE ANALYTICS: Predictive Analytics Concentration
 - CYBER-SECURITY: Information Assurance and Security Concentration
 - MATH FINANCE: Mathematical Finance Concentration
 - MATH INSTRUCTION: Mathematics Instruction Concentration
- **PSM in Computer Science and Quantitative Methods (PSM CSqm)**
 - DATA SCIENCE: Data Management and Analysis Concentration
 - PREDICTIVE ANALYTICS: Predictive Analytics Concentration
 - CYBER-SECURITY: Information Assurance and Security Concentration
 - MATH FINANCE: Mathematical Finance Concentration

Our departments offer both online and on-campus M.S. and PSM degrees ideal for professionals in a wide variety of science and mathematics career fields. These master's degree programs are designed to allow students to pursue advanced training in science or mathematics while developing workplace skills valued by employers. We aim to produce well-rounded science professionals who have a deep knowledge of their subject but also have the ability to communicate effectively and manage projects.

Advisors are available to assist prospective students in choosing a concentration and planning a program that will lead to graduation. Information on all the programs in the Department is available at the Department's Web site, www.apsu.edu/csci. For more information, please contact one of the following:

Dr. Jiang Li, Professor, Graduate Coordinator
– for **Data Management and Analysis Concentration**
Department of Computer Science & Information Technology
(931) 221- 7828; email: lij@apsu.edu

Dr. Joseph V. Elarde, Assoc. Professor, Graduate Coordinator
– for **Information Assurance and Security Concentration**
Department of Computer Science & Information Technology
(931) 221-7301; email: elardej@apsu.edu

Dr. Mir A. Hasan, Asst. Professor, Graduate Coordinator
– for **Information Assurance and Security Concentration**
Department of Computer Science & Information Technology
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Dr. Matthew Jones, Professor, Graduate Coordinator
– for **Predictive Analytics Concentration**
Department of Mathematics and Statistics
(931) 221- 7814; email: jonesmatt@apsu.edu

Dr. Ramanjit K. Sahi, Professor, Graduate Coordinator
– for **Mathematical Finance Concentration**
Department of Mathematics and Statistics
(931) 221-7812; email: sahir@apsu.edu

Dr. S. Jackie Vogel, Professor, Graduate Coordinator
– for **Mathematics Instruction Concentration**
Department of Mathematics and Statistics
(931) 221-7313; email: vogelj@apsu.edu

Master of Science (M.S.) Degree in Computer Science and Quantitative Methods
Professional Science Master's (PSM) Degree in Computer Science and Quantitative Methods

Graduation Checklist, M.S. & PSM

- ___ Complete the General Core.
- ___ Complete the Major Field Core.
- ___ Complete the Concentration Courses.
- ___ Maintain a GPA of 3.0 or better.
- ___ Complete all credit hours below (with a GPA of 3.0 or better).

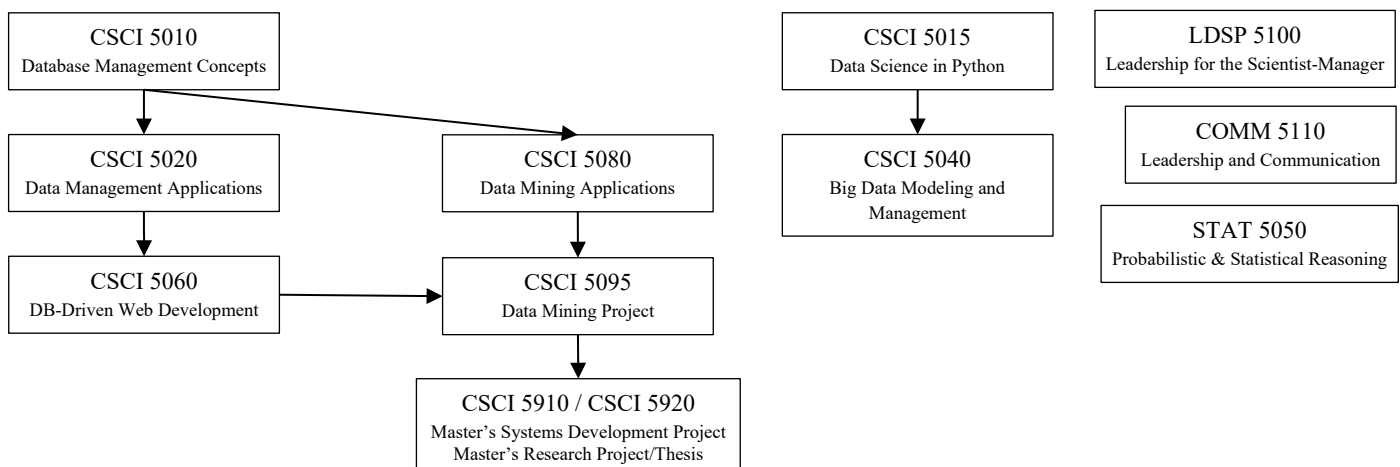
Master of Science (M.S.) Degree in Computer Science and Quantitative Methods

Data Management and Analysis Concentration

A.	Major Core	(9 Credit Hours)
	COMM 5110 - Leadership and Communication	3
	LDSP 5100 - Leadership for the Scientist-Manager	3
	STAT 5050 - Probabilistic and Statistical Reasoning	3
B.	Concentration	(24 - 27 Credit Hours)
	CSCI 5010 - Database Management Concepts	3
	CSCI 5015 - Data Science in Python	3
	CSCI 5020 - Data Management Applications	3
	CSCI 5040 - Big Data Modeling and Management	3
	CSCI 5060 - Database-Driven Web Development	3
	CSCI 5080 - Data Mining Applications	3
	CSCI 5095 - Data Mining Project	3
	Select one (1) course from the list below (3-6 hours)	
	CSCI 5910 - Master's Systems Development Project	3/6
	CSCI 5920 - Master's Research Project/Thesis	3/6

Total credit hours for degree completion 33-36

M.S. CSQM - Data Management and Analysis Concentration Prerequisite Chart

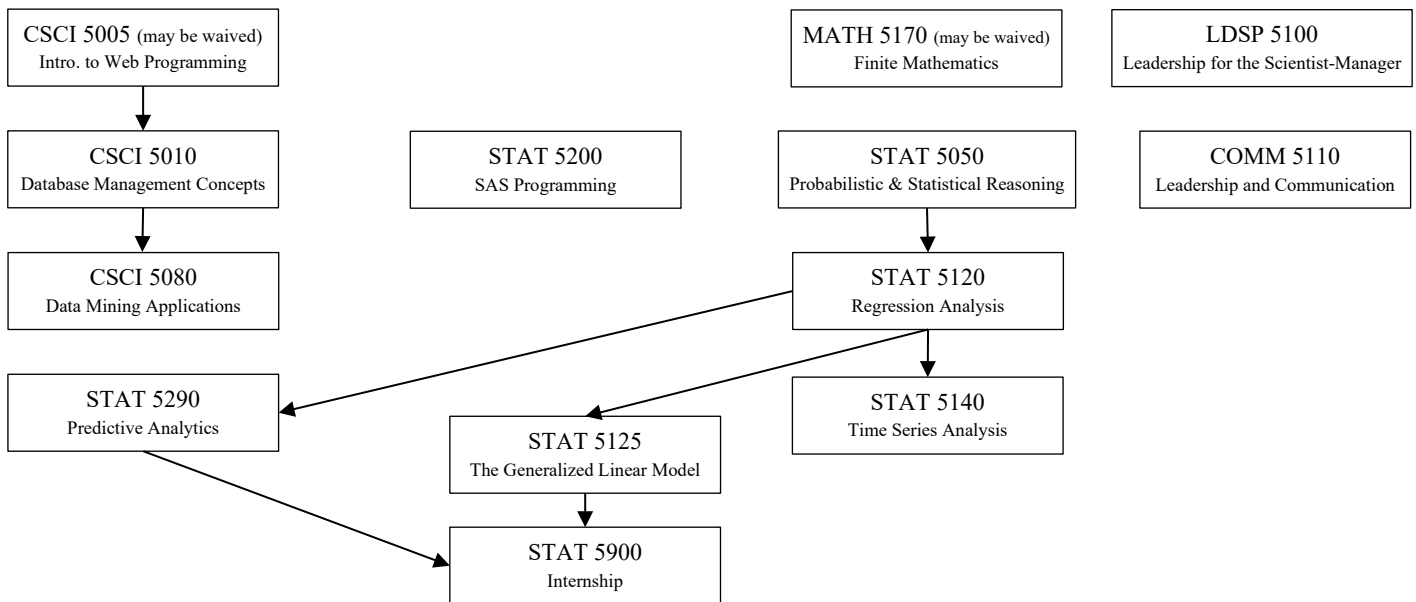


Master of Science (M.S.) Degree in Computer Science and Quantitative Methods
Predictive Analytics Concentration

A. Major Core	(9 credit hours)
COMM 5110 - Leadership and Communication	3
LDSP 5100 - Leadership for the Scientist-Manager	3
STAT 5050 - Probabilistic and Statistical Reasoning	3
B. Concentration	(24 - 30 credit hours)
CSCI 5005 - Introduction to Web Programming (may be waived)	3
CSCI 5010 - Database Management Concepts	3
CSCI 5080 - Data Mining Applications	3
MATH 5170 - Finite Mathematics (may be waived)	3
STAT 5120 - Regression Analysis	3
STAT 5125 - The Generalized Linear Model	3
STAT 5140 - Time Series Analysis	3
STAT 5200 - SAS Programming	3
STAT 5290 - Predictive Analytics	3
STAT 5900 - Internship	3

Total credit hours for degree completion 33-39

M.S. CSQM - Predictive Analytics Concentration Prerequisite Chart



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Master of Science (M.S.) Degree in Computer Science and Quantitative Methods
Information Assurance and Security Concentration

A. Major Core	(9 credit hours)
COMM 5110 - Leadership and Communication	3
LDSP 5100 - Leadership for the Scientist-Manager	3
STAT 5050 - Probabilistic and Statistical Reasoning	3
 B. Concentration	 (24 - 27 credit hours)
CSCI 5200 - Principles of Information Security	3
CSCI 5600 - Computer Ethics	3
CSCI 5613 - Cryptography	3
 Concentration Guided Electives	
Select four (4) courses from the list below	
CSCI 5520 - Network Security	3
CSCI 5611 - Computer Forensics and Incident Response	3
CSCI 5612 - Securing Cyberspace (Web, DB, and Platforms)	3
CSCI 5617 - Security Policy and Governance	3
CSCI 5619 - Ethical Hacking and Offensive Security	3
CSCI 5624 - Risk Management	3
CSCI 5625 - Intrusion Detection and Prevention	3
CSCI 5628 - Defensive Programming	3
CSCI 5632 - Secure Software Engineering	3
CSCI 5635 - Malware Analysis and Countermeasures	3
CSCI 5670 - Enterprise Virtualization	3
Select one (1) course from the list below (3-6 hours)	
CSCI 5910 - Master's Systems Development Project	3/6
CSCI 5920 - Master's Research Project/Thesis	3/6

Total credit hours for degree completion 33-36

Master of Science (M.S.) Degree in Computer Science and Quantitative Methods
Mathematical Finance Concentration

A.	Major Core	(9 Credit hours)
	COMM 5110 - Leadership and Communication	3
	LDSP 5100 - Leadership for the Scientist-Manager	3
	STAT 5050 - Probabilistic and Statistical Reasoning	3
B.	Concentration	(15 credit hours)
	MATH 5130 - Financial Mathematics	3
	MATH 5140 - Financial Derivatives	3
	MATH 5220 - Computational Methods in Finance	3
	MATH 5260 - Stochastic Processes	3
	Complete one course from	3
	STAT 5900 - Internship	
	STAT 5910 - Capstone Project	
	MATH 5910 - Capstone Project	
	MATH 5900 - Internship	3
C.	Concentration Guided Electives	(6 - 12 credit hours)
	Select advisor approved courses from the list below	
	MGT 5020 - Managerial Use of Financial Reports	
	MATH 5000 - 5999	
	STAT 5000 - 5999	
	CSCI 5000 - 5999	
	ACCT 5000 - 5999	

Total credit hours for degree completion 30-36

Master of Science (M.S.) Degree in Computer Science and Quantitative Methods
Mathematics Instruction Concentration

A.	Major Core	(9 credit hours)
	COMM 5110 - Leadership and Communication	3
	LDSP 5100 - Leadership for the Scientist-Manager	3
	STAT 5050 - Probabilistic and Statistical Reasoning	3
B.	Concentration	(9 credit hours)
	MATH 5350 - Calculus from an Advanced Perspective	3
	MATH 5520 - Algebra from an Advanced Perspective	3
	MATH 5640 - Geometry from an Advanced Perspective	3
C.	Concentration Guide Electives	(12 credit hours)
	Option I	
	(Non-Community College Instruction Path, Research Project required)	
	MATH 5090 - Scientific Writing in Mathematics	3
	MATH 5940 - Research in Mathematics	3
	Select two (2) courses from the list below	
	MATH 5070 - Methods, Materials and Strategies in Teaching Mathematics	3
	MATH 5080 - Mathematics in a Technological World	3
	MATH 5120 - Contemporary Approaches to Problem Solving and Proof	3
	MATH 5170 - Finite Mathematics	3
	OR	
	Option II	
	(Community College Instruction Path, Comprehensive Exam Required)	
	Select four (4) courses from the list below	
	MATH 5000 - 5999	
	STAT 5000 - 5999	
	CSCI 5000 - 5999	

Total credit hours for degree completion 30

Professional Science Master's (PSM) Degree in Computer Science and Quantitative Methods

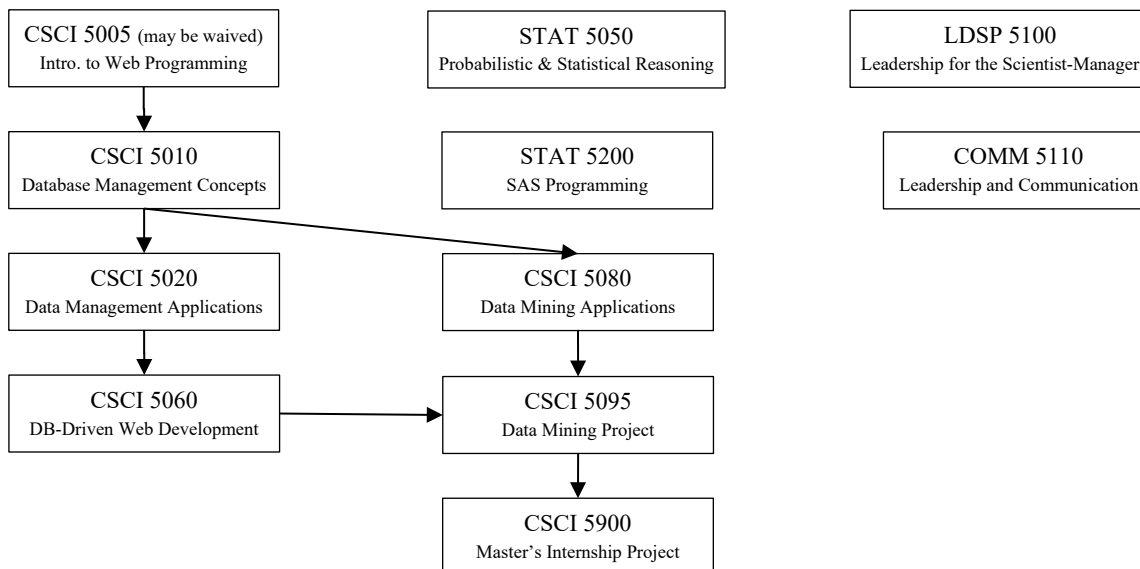
Data Management and Analysis Concentration

A.	Major Core	(9 credit hours)
	COMM 5110 - Leadership and Communication	3
	LDSP 5100 - Leadership for the Scientist-Manager	3
	STAT 5050 - Probabilistic and Statistical Reasoning	3
B.	Concentration	(21 - 24 credit hours)
	(same as Predictive Analytics Con.)	
	CSCI 5005 - Introduction to Web Programming (may be waived)	3
	CSCI 5010 - Database Management Concepts	3
	CSCI 5080 - Data Mining Applications	3
	STAT 5200 - SAS Programming	3

Concentration

CSCI 5020 - Data Management Applications
 CSCI 5060 - Database-Driven Web Development
 CSCI 5095 - Data Mining Project
 CSCI 5900 - Master's Internship Project

Total credit hours for degree completion 30-33

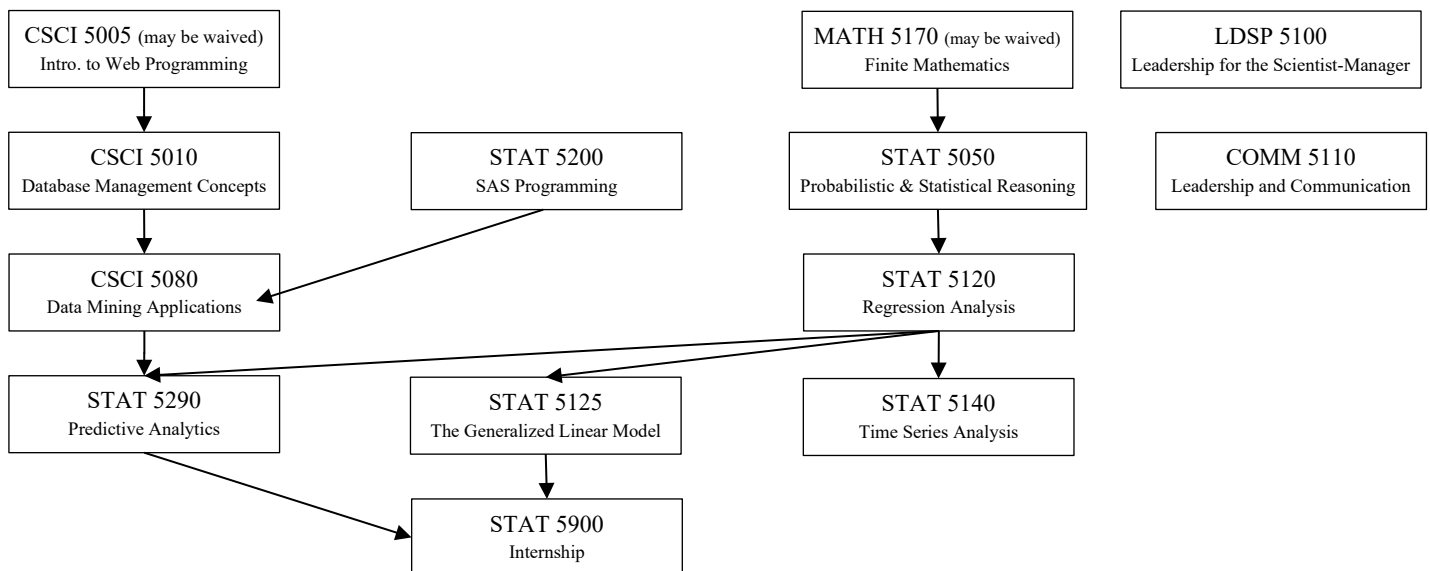
PSM CSQM - Data Management and Analysis Concentration Prerequisite Chart

Professional Science Master's (PSM) Degree in Computer Science and Quantitative Methods
Predictive Analytics Concentration

A. Major Core	(9 credit hours)
COMM 5110 - Leadership and Communication	3
LDSP 5100 - Leadership for the Scientist-Manager	3
STAT 5050 - Probabilistic and Statistical Reasoning	3
B. Concentration	(24 - 30 credit hours)
(same as Data Management and Analysis Con.)	
CSCI 5005 - Introduction to Web Programming (may be waived)	3
CSCI 5010 - Database Management Concepts	3
CSCI 5080 - Data Mining Applications	3
STAT 5200 - SAS Programming	3
Concentration	
MATH 5170 - Finite Math (may be waived)	3
STAT 5120 - Regression Analysis	3
STAT 5125 - The Generalized Linear Model	3
STAT 5140 - Time Series Analysis	3
STAT 5290 - Predictive Analytics	3
STAT 5900 - Internship	3

Total credit hours for degree completion 33-39

PSM CSQM - Predictive Analytics Concentration Prerequisite Chart



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Professional Science Master's (PSM) Degree in Computer Science and Quantitative Methods
Information Assurance and Security Concentration

A.	Major Core	(9 credit hours)
	COMM 5110 - Leadership and Communication	3
	LDSP 5100 - Leadership for the Scientist-Manager	3
	STAT 5050 - Probabilistic and Statistical Reasoning	3
B.	Concentration	(24 - 27 credit hours)
	CSCI 5200 - Principles of Information Security	3
	CSCI 5600 - Computer Ethics	3
	CSCI 5613 - Cryptography	3
	Concentration Guided Electives	
	Select four (4) courses from the list below	
	CSCI 5520 - Network Security	3
	CSCI 5611 - Computer Forensics and Incident Response	3
	CSCI 5612 - Securing Cyberspace (Web, DB, and Platforms)	3
	CSCI 5617 - Security Policy and Governance	3
	CSCI 5619 - Ethical Hacking and Offensive Security	3
	CSCI 5624 - Risk Management	3
	CSCI 5625 - Intrusion Detection and Prevention	3
	CSCI 5628 - Defensive Programming	3
	CSCI 5632 - Secure Software Engineering	3
	CSCI 5635 - Malware Analysis and Countermeasures	3
	CSCI 5670 - Enterprise Virtualization	3
	Select one (1) course from the list below (3-6 hours)	
	CSCI 5910 - Master's Systems Development Project	3/6
	CSCI 5920 - Master's Research Project/Thesis	3/6

Total credit hours for degree completion 33-36

Professional Science Master's (PSM) Degree in Computer Science and Quantitative Methods
Mathematical Finance Concentration

A.	Major Core	(9 credit hours)
	COMM 5110 - Leadership and Communication	3
	LDSP 5100 - Leadership for the Scientist-Manager	3
	STAT 5050 - Probabilistic and Statistical Reasoning	3
B.	Concentration	(15 credit hours)
	MATH 5130 - Financial Mathematics	3
	MATH 5140 - Financial Derivatives	3
	MATH 5220 - Computational Methods in Finance	3
	MATH 5260 - Stochastic Processes	3
	Complete one course from	3
	STAT 5900 - Internship	
	STAT 5910 - Capstone Project	
	MATH 5910 - Capstone Project	
	MATH 5900 - Internship	
C.	Concentration Guided Electives	(6 - 12 credit hours)
	Select advisor approved courses from the list below	
	MGT 5020 - Managerial Use of Financial Reports	
	MATH 5000 - 5999	
	STAT 5000 - 5999	
	CSCI 5000 - 5999	
	ACCT 5000 - 5999	

Total credit hours for degree completion 30-36