Master of Science in Data Science Advisement Guidelines

Revised

July 14, 2025

Department of Computer Science and Information Technology

College of Science, Technology, Engineering and Mathematics

Clayton State University

MASTER OF SCIENCE IN DATA SCIENCE (MSDS)

MSDS enables students to pursue advanced careers in Data Science, addressing state and national workforce shortages and supporting the growth of the local knowledge-based economy. The program equips students with the knowledge and skills to advance their current careers in or perform a mid-career transition into data science fields, to work independently and collaboratively, and to pursue academic or professional careers in education and research, industry, business, or government.

STUDENT OUTCOMES

Graduates of this program will be able to:

- demonstrate a comprehensive understanding of data science
- utilize advanced data science knowledge and skills to solve complex computing problems related to data science specialization
- identify and analyze user needs, and integrate data science-based solutions into user environment
- possess skills in data science leadership and information management.

ADMISSION REQUIREMENTS

- To be admitted into MSDS, an applicant must have earned a bachelor's degree with a minimum 2.5 GPA from an accredited college or university.
- Students must submit a copy of their resume.
- International students whose native language is not English are required to submit English Language Proficiency through one of the following options: TOEFL (minimum score of 78 total on the internet-based TOEFL), IELTS (minimum score of 6 total), Duolingo English Test (Minimum score of 100), or successful completion of an approved University System of Georgia (USG) intensive ESL program.
- If an applicant has completed any coursework, degree, or degrees from institutions outside of the United States, he or she must utilize a credential evaluation service. The School of Graduate Studies accepts an official course-by-course evaluation with a GPA that is prepared by either Josef Silney and Associates or World Education Services.

CREDIT TRANSFER

Students can transfer, at most, 6 credit hours of non-core courses from other college or university subjects to the approval of Clayton State University.

ACADEMIC ADVISEMENT

Please note it is the students' responsibility to follow the Department policies and get proper advisement to complete the degree requirements and graduate on time. Hence, once the student is admitted into MSDS programs, the student must:

- Schedule an appointment with the program coordinator to develop a study/graduation plan in their first semester.
- Seek the program coordinator's approval before adding or dropping a class.
- Periodically update their study plan with the program coordinator.

PROGRAM REQUIREMENTS

The program offers three program tracks: the Applied (Project) Track, the Research (Thesis) Track, and the Course Only track.

1. Applied (Project) Track
   Students who select the Applied (Project) track must successfully complete a total of 30 credit hours:
   - Four (4) MSDS core courses: 12 credit hours
   - Four (4) concentration courses: 12 credit hours
   - CSCI 6574 Research Techniques: 3 credit hours
   - CSCI 6598 Special Project: 3 credit hours

2. Research (Thesis) Track
   Students who select the Research (Thesis) track must successfully complete a total of 30 credit hours:
   - Four (4) MSDS core courses: 12 credit hours
   - Four (4) concentration courses: 12 credit hours4
   - CSCI 6574 Research Techniques: 3 credit hours
   - CSCI 6601 Thesis: 3 credit hours

3. Course Only Track
   Students who select the Course Only track must successfully complete a total of 30 credit hours:
   - Four (4) MSDS core courses: 12 credit hours
   - Four (4) concentration courses: 12 credit hours
   - CSCI 6574 Research Techniques: 3 credit hours
   - One additional CSIT graduate course: 3 credit hours

REQUIRED CORE COURSES

- CSCI 5101 Foundations of Information Systems Security and Ethics
- CSCI 5112 System Analysis & Design
- CSCI 5201 Database Theory and Design
- CSCI 5317 Operating Systems Administration and Security

CONCENTRATION COURSES

Choose 4 courses (12 credit hours) for a chosen concentration:

- Data Management and Intelligence
  CSCI 6201 Data Management for Analytics
  CSCI 6202 Data Mining and Data Warehousing
  CSCI 6307 Foundation of Artificial Intelligence and Deep Learning
  CSCI 6308 Cloud Computing
  CSCI 6433 Web Application Development
  CSCI 6093 Advanced Topics in Information Systems

- Knowledge and Information Systems
  CSCI 6012 Information Risk Management
  CSCI 6307 Foundation of Artificial Intelligence and Deep Learning
  CSCI 6433 Web Application Development
  CSCI 6812 Data Science
  CSCI 6820 Knowledge Engineering
  CSCI 6093 Advanced Topics in Information Systems

- Health Informatics
  CSCI 6443 Digital Transformation
  CSCI 6710 Health Care Analytics and Applications
  CSCI 6701 Introduction to Health Informatics
  CSCI 6705 Foundations of Clinical Processes and Workflows
  HCMG 5100 Health Systems Administration
  HCMG 6100 Information Mgmt.-Health Care
  CSCI 6093 Advanced Topics in Information Systems

CSCI 6598 SPECIAL PROJECT REQUIREMENTS

1. Special Project Supervisor

   In the semester before the CSCI 6599 Special Project semester, a student must select a graduate faculty member in the Department as his/her project supervisor and submit the completed Special Project Supervisor Form to the MSDS Program Coordinator before October 1st (if he/she will register for CSCI 6599 in the following Spring semester) or March 1st (if he/she will register for CSCI 6599 in the following Fall semester).

2. Special Project Proposal
   After submitting the Special Project Supervisor Form, the student must work with the supervisor to propose a project for the Special Project course. The proposal must be presented to the supervisor before the supervisor approves the proposal. The student must submit the completed Special Project Proposal Approval Form to the MSDS Program Coordinator by December 1st (if he/she will register for CSCI 6599 in the

following Spring semester) or May 1st (if he/she will register for CSCI 6599 in the following Fall semester).

3. Special Project Presentation
   After completing the project, the student must present and defend the project to all faculty members in the Department at a scheduled time by no later than the withdrawal deadline of the graduating semester.

4. Special Project Report
   The student must complete the project report and get it approved by the supervisor and file a copy of the approved project report to the department by December 1st (Fall Semester Project) or May 1st (Spring Semester Project). Please refer to the Special Project Format Guideline when completing the report.

CSCI 6601 THESIS REQUIREMENTS

1. Thesis Chair & Committee Members

   In the semester before the CSCI 6600 Thesis semester, a student must select a graduate faculty member in the Department as his/her thesis chair and consult with his/her thesis chair to select at least one more member to form the thesis committee. The student must submit the completed Thesis Chair and Thesis Committee Selection Form to the MSDS Program Coordinator before October 1st (if he/she will register for CSCI 6600 in the following Spring semester) or March 1st (if he/she will register for CSCI 6600 in the following Fall semester).

2. Thesis Proposal
   The students must work with the thesis committee to prepare a thesis proposal and present it to the faculty members in the Department. The students must submit a copy of the Thesis Prospectus Approval Form electronically to the School of Graduate Studies by December 1st (if he/she will register for CSCI 6600 in the following Spring semester) or May 1st (if he/she will register for CSCI 6600 in the following Fall semester).

3. Written Thesis Approval & Oral Defense
   The student must complete the thesis, get the written thesis approved for oral defense on the Approval Form for master's Thesis (See Graduate Thesis Guide for thesis formatting requirements), and defend the thesis no later than the midpoint of the semester the student plans to graduate (See the Academic Calendar for midpoint deadlines). The student must make all corrections to the thesis as requested by the committee, and get the Thesis Chair and the Graduate Coordinator sign the rest of the Approval Form for master's Thesis no later than the withdrawal deadline of the graduating semester.

4. Clayton State Digital Repository (CSDR)
   The student must create an account on CSDR and upload the thesis to CSDR (See https://www.clayton.edu/library/repository for more details).

GRADUATE FACULTY

- Shakil Akhtar, Professor
- Xiangdong An, Assistant Professor
- Shuju Bai, Professor
- Byron Jeff, Associate Professor
- Ebrahim Khosravi, Professor
- Ken Nguyen, Professor
- Junfeng Qu, Professor
- Muhammad Rahman, Professor

GRADUATION PREPARATION

If you are scheduled to complete your degree requirements in the upcoming semester, be sure to meet with your program coordinator to confirm that you are on track to graduate. Once you have determined that you are ready to apply for graduation, complete the application by the appropriate deadline: June 1 for Fall graduation, September 15 for Spring graduation, and January 30 for summer graduation.

PLAN OF STUDY & RECOMMENDED COURSE SEQUENCES

MSDS Program Plan of Study

Note: Plan of Study must be approved by the student's Graduate Program Coordinator

Student Information

Name _____ Laker ID _____

Email _____ Phone _____

Graduate Program Coordinator: Dr. Xiangdong An _____

Graduate Program Coordinator Signature Date

		Course ID	Course Title	Semester	Year	Credits
Core Courses (12 credit hours)	Students must take all the 4 core courses	CSCI 5101	Foundations of Info. Sys. Secur. & Ethics (3)	Fall		3
		CSCI 5112	System Analysis and Design (3)	Fall		3
		CSCI 5201	Database Theory and Design (3)	Spring		3
		CSCI 5317	Operation Systems Admin & Security (3)	Spring		3
Select one concentration (12 credit hours)	Data Management and Intelligence (select 4 courses)	CSCI 6201	Data Management for Analytics (3)			
		CSCI 6202	Data Mining and Data Warehousing (3)			
		CSCI 6307	Foundation of AI and Deep Learning (3)	Fall		
		CSCI 6308	Cloud Computing (3)	Spring		
		CSCI 6433	Web App Development (3)	Fall		
		CSCI 6093	Adv. Topics in Info. Systems (3)	Spring		
	Knowledge & Information Systems (select 4 courses)	CSCI 6012	Information Risk Management (3)	Spring		
		CSCI 6307	Foundation of AI and Deep Learning (3)	Fall		
		CSCI 6433	Web App Development (3)	Fall		
		CSCI 6812	Data Science (3)			
		CSCI 6820	Knowledge Engineering (3)			
		CSCI 6093	Adv. Topics in Info. Systems (3)	Spring		
	Health Informatics (select 4 courses)	CSCI 6443	Digital Transformation (3)			
		CSCI 6701	Intro. To Health Informatics (3)			
		CSCI 6705	Foundations of Clinical Process & Workflows (3)			
		CSCI 6710	Healthcare Analytics and Applications (3)			
		HCMG 5100	Health Systems Administration (3)	Fall		
		HCMG 6100	Information Mgmt.-Health Care (3)	Fall/Spring		
		CSCI 6093	Adv. Topics in Information Systems	Spring		
Research techniques (3 credit hours)		CSCI 6574	Research Techniques (3)	Fall/Spring		3
Select one track (3 credit hours)	Project Track	CSCI 6598	Special Project (3)	Fall/Spring		
	Thesis Track	CSCI 6601	Thesis (3)	Fall/Spring		
	Course Only Track	CSCI				
Total Credits						30

Note:

1. Take CSCI 6574 in the first semester if you plan to graduate in 3 semesters. CSCI 6574 is a prerequisite for CSCI 6598/6601.
2. Identify a CSIT professor to serve as your supervisor before you take CSCI 6601 or CSCI 6598.
3. CSCI 6601 or CSCI 6598 must be scheduled in your last semester of the graduate program.
4. A graduate student can take at most 12 credit hours in each semester, and at most 6 credit hours if placed on Academic Probation. Graduate students whose institutional GPA falls below the minimum acceptable GPA of 3.0 are placed on Academic Probation.
5. A grade of at least C is required for each course, but a student must achieve a cumulative institutional GPA of at least 3.00 in all graduate courses taken at the time of graduation.

MSDS Program Recommended Sequences of Courses for 3 Semester Completion

Data Management & Intelligence Concentration		Knowledge & Information Systems Concentration		Health Informatics Concentration	
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics
CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design
CSCI 6307	Fndn AI & Deep Learn	CSCI 6307	Fndn AI & Deep Learn	HCMG 5100	Health Sys Adm
CSCI 6574	Research Techniques	CSCI 6574	Research Techniques	CSCI 6574	Research Techniques
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design
CSCI 5317	OS Admin & Security	CSCI 5317	OS Adm & Sec	CSCI 5317	OS Admin & Security
CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys
CSCI 6308	Cloud Computing	CSCI 6012	Info Risk Mgmt	CSCI 6701	Intro to Health Inform
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 6433	Web App Dev	CSCI 6433	Web App Dev are	HCMG 6100	Info Mgmt Health Care
CSCI 6598 /	Special Project /	CSCI 6598 /	Special Project /	CSCI 6598 /	Special Project /
6601 / ___	Thesis / _____	6601 / ___	Thesis / _____	6601 / ___	Thesis / _____

Data Management & Intelligence Concentration		Knowledge & Information Systems Concentration		Health Informatics Concentration	
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics	HCMG 5100	Health Sys Adm
CSCI 6574	Research Techniques	CSCI 6574	Research Techniques	CSCI 6574	Research Techniques
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design
CSCI 5317	OS Admin & Security	CSCI 5317	OS Adm & Sec	CSCI 5317	OS Admin & Security
CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys
CSCI 6308	Cloud Computing	CSCI 6012	Info Risk Mgmt	CSCI 6701	Intro to Health Inform
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design	CSCI 5101	Fndn Info Sys Sec Ethics
CSCI 6307	Fndn AI & Deep Learn	CSCI 6307	Fndn AI & Deep Learn	CSCI 5112	Sys Analysis & Design
CSCI 6433	Web App Dev	CSCI 6433	Web App Dev	HCMG 6100	Info Mgmt Health Care
CSCI 6598 /	Special Project /	CSCI 6598 /	Special Project /	CSCI 6598 /	Special Project /
6601 / ___	Thesis / _____	6601 / ___	Thesis / _____	6601 / ___	Thesis / _____

Data Management & Intelligence Concentration		Knowledge & Information Systems Concentration		Health Informatics Concentration	
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics
CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design	HCMG 5100	Health Sys Adm
CSCI 6574	Research Techniques	CSCI 6574	Research Techniques	CSCI 6574	Research Techniques
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 5317	OS Adm & Sec	CSCI 5317	OS Adm & Sec	CSCI 5201	DB Theory & Design
CSCI 5701	Intro to Cybersec	CSCI 5701	Intro to Cybersec	CSCI 5317	OS Adm & Sec
CSCI 6093	Adv Topics in Info	CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys
CSCI 6308	SysCloud Computing	CSCI 6012	Intro to Risk Mgmt	CSCI 6701	Intro to Health Inform
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 6307	Fndn AI & Deep Learn	CSCI 6307	Fndn AI & Deep Learn	CSCI 5112	Sys Analysis & Design
CSCI 6433	Web App Dev	CSCI 6433	Web App Dev	HCMG 6100	Info Mgmt Health Care
CSCI 6598 /	Special Project /	CSCI 6598 /	Special Project /	CSCI 6598 /	Special Project /
6601 / ___	Thesis / _____	6601 / ___	Thesis / _____	6601 / ___	Thesis / _____

Data Management & Intelligence Concentration		Knowledge & Information Systems Concentration		Health Informatics Concentration	
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design
CSCI 5317	OS Adm & Sec	CSCI 5317	OS Adm & Sec	CSCI 5317	OS Adm & Sec
CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys
CSCI 6574	Research Techniques	CSCI 6574	Research Techniques	CSCI 6574	Research Techniques
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics
CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design
CSCI 6307	Fndn AI & Deep Learn	CSCI 6307	Fndn AI & Deep Learn	HCMG 5100	Health Sys Adm
CSCI 6433	Web App Dev	CSCI 6433	Web App Dev	HCMG 6100	Info Mgmt Health Care
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 6308	Cloud Computing	CSCI 6012	Info Risk Mgmt	CSCI 6701	Intro to Health Inform
CSCI 6598 / 6601 / ___	Special Project / Thesis / _____	CSCI 6598 / 6601 / ___	Special Project / Thesis / _____	CSCI 6598 / 6601 / ___	Special Project / Thesis / _____

Data Management & Intelligence Concentration		Knowledge & Information Systems Concentration		Health Informatics Concentration	
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design
CSCI 6574	Research Techniques	CSCI 6574	Research Techniques	CSCI 6574	Research Techniques
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics
CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design
CSCI 6307	Fndn AI & Deep Learn	CSCI 6307	Fndn AI & Deep Learn	HCMG 5100	Health Sys Adm
CSCI 6433	Web App Dev	CSCI 6433	Web App Dev	HCMG 6100	Info Mgmt Health Care
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 5317	OS Adm & Sec	CSCI 5317	OS Adm & Sec	CSCI 5317	OS Adm & Sec
CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys
CSCI 6308	Cloud Computing	CSCI 6012	Info Risk Mgmt	CSCI 6701	Intro to Health Inform
CSCI 6598 / 6601 / ___	Special Project / Thesis / _____	CSCI 6598 / 6601 / ___	Special Project / Thesis / _____	CSCI 6598 / 6601 / ___	Special Project / Thesis / _____

Data Management & Intelligence Concentration		Knowledge & Information Systems Concentration		Health Informatics Concentration	
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design	CSCI 5201	DB Theory & Design
CSCI 5317	OS Adm & Sec	CSCI 5317	OS Adm & Sec	CSCI 5317	OS Adm & Sec
CSCI 6574	Research Techniques	CSCI 6574	Research Techniques	CSCI 6574	Research Techniques
Fall Semester		**Fall Semester**		**Fall Semester**	
CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics	CSCI 5101	Fndn Info Sys Sec Ethics
CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design	CSCI 5112	Sys Analysis & Design
CSCI 6307	Fndn AI & Deep Learn	CSCI 6307	Fndn AI & Deep Learn	HCMG 5100	Health Sys Adm
CSCI 6433	Web App Dev	CSCI 6433	Web App Dev	HCMG 6100	Info Mgmt Health Care
Spring Semester		**Spring Semester**		**Spring Semester**	
CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys	CSCI 6093	Adv Topics in Info Sys
CSCI 6308	Cloud Computing	CSCI 6012	Info Risk Mgmt	CSCI 6701	Intro to Health Inform
CSCI 6598 / 6601 / ___	Special Project / Thesis / _____	CSCI 6598 / 6601 / ___	Special Project / Thesis / _____	CSCI 6598 / 6601 / ___	Special Project / Thesis / _____

COURSE DESCRIPTION

CSCI 5101. Foundations of Information Sys (3)

This course covers the fields of enterprise security and privacy. The course deals with the identification of threats to enterprise information technology (IT) systems, access control and open systems, and system and product evaluation criteria. In addition, it discusses the enterprise security requirements. Risk management and policy considerations are examined with respect to the technical nature of enterprise security as represented by government guidance and regulations to support information confidentiality, integrity and availability. The course also deals with the fundamental hacking approaches through practical exposure via hands-on assignments, discussions, and quizzes. For lab assignments, students are expected to use various tools to complete the deliverable(s).

CSCI 5112. System Analysis & Design (3)

This course will introduce the concepts and techniques for analyzing and designing business information systems. Topics include the system analysis, the systems development life cycle, system development methodologies, development technology, systems implementation, and systems support. Tools and techniques for systems analysis and systems design are also introduced.

CSCI 5201. Database Theory and Design (3)

This course presents terminology, basic concepts, and applications of database processing. The course emphasizes database design using various modeling techniques; database implementation using the relational model, normalization, and SQL.

CSCI 5317. Operating Systems Admin& Secur (3)

This course covers computer operating systems, such as UNIX and Linux, systems programming, systems administration, and operating systems hardening.

CSCI 6012. Information Risk Management (3)

This course will provide students with a good understanding of identifying, assessing, analyzing, measuring, and responding to information risk. Students will be able to make risk mitigation and acceptance decisions given its resource constraints. Students will be able to use risk management tools, regulations, and methodologies for metrics to monitor risk management activities.

CSCI 6093. Advanced Topics in Informatio (3)

Selected advanced topics of current interest in information systems will be presented in this course. Students will review the articles, journals, white papers, and use computerized databases and library resources. This course will be offered as fits the needs and interests of the students and faculty.

CSCI 6201. Data Management for Analytics (3)

Covers the theory and applications of data management to support data analytics, including data models, security, examination, transformation, and exploration. Discusses the

fundamental concepts and emerging technologies include relational databases, NoSQL databases, data integration, and data processing for analytics.

CSCI 6202. Data Mining and Data Warehousi (3)

This course introduces students to algorithms and skills for data mining and overall architecture of data warehousing. Topics include data cube technology, pattern recognition, advanced classification and clustering analysis, outlier detection, data visualization, data integration, and data warehousing. Data mining and data warehousing applications will also be discussed.

CSCI 6307. Foundation of Artificial Intel (3)

This course is an introduction to artificial intelligence and deep learning. Topics include (1) traditional intelligent system design methodologies, search and problem solving, supervised and reinforced learning, and (2) the technologies, methodologies, and tools for deep learning such as neural networks and optimization algorithms.

CSCI 6308. Cloud Computing (3)

This course introduces students to the Cloud concepts and capabilities across the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Business Process as a Service (BPaaS). It covers a broad range of Cloud vendor platforms including AWS, Google App Engine, Microsoft Azure, Eucalyptus, OpenStack and others. The topics include both concepts on parallel and distributed computing platforms and programming skills required for harvesting computational powers.

CSCI 6433. Web Application Development (3)

This course will introduce students to the concepts and fundamental practices necessary to create interactive web-based applications. Application design and development are covered including control mechanisms, models, and views design and development. Students will learn both server size and client site fundamental scripting will be introduced along with customized databases for team projects.

CSCI 6443. Digital Transformation (3)

This course provides students with insights on key aspects of Digitalization and Business Transformation. Students will understand the disruptive nature of Digitalization and consequences for Business Strategies and Business Transformation across all industries. Students will receive a short introduction on the development of Information Systems over the last 25 years and today's most important technologies and technology providers. Furthermore, students will gain an understanding of key technologies like Cloud Computing, Internet of Things, Big Data Analysis, and Artificial Intelligence.

CSCI 6574. Research Techniques (3)

Students will learn how to conduct literature reviews of articles, journals, and white papers using Internet, computerized databases and library resources. Students will learn to develop research questions, hypotheses, research topics, research designs and write research papers in standard format.

CSCI 6598. Special Project (3)

Continuation of research on Special Project. Satisfactory oral defense of topic is required for graduation.

CSCI 6601. Thesis (3)

Continuation of research on thesis. Satisfactory oral defense of topic is required for graduation.

CSCI 6701. Introduction to Health Informa (3)

This course will present the knowledge, infrastructure, functions, and tools of health informatics. The course provides an overview of the theory, processes, and applications of information systems to healthcare, policy, and management. It also provides a basic understanding of data standards and requirements, critical concepts and practices in mapping and interpreting health information. It explores technology in planning, management, and applications in healthcare. Topics also include core concepts and issues in planning, implementing, and evaluating health information systems.

CSCI 6705. Found. Clinic. Proc. and Work. (3)

This course provides an understanding of applications of information systems in healthcare processes and workflows. Students will become familiar with fundamentals of medical terms, coding systems, electronic health records, processes, process analysis and redesign in the healthcare settings. The course also introduces clinical workflows and process evaluation, re-engineering with advanced information management tools and techniques, and case studies.

CSCI 6710. Health Care Analytics and Appl (3)

This course is designed to provide students with an understanding of healthcare data models that could help improve administrative costs, decision making, patient care and patient wellness. Fundamentals of data sciences based upon statistical and biological models will be discussed. Applications to environmental health and other relevant healthcare fields will be considered.

CSCI 6812. Data Science (3)

This course will introduce students to data science and skills used in data science. It includes concepts from Statistics, Computer Science and Software Engineering. Students will learn theory and skills of data management, data storage, data processing and analysis, data visualization, and data application. Data science programming languages such as Python and their associated data analysis libraries will be learned through hands-on practices. In addition, students will learn skills of developing data products via programming, research, and communicating results.

CSCI 6820. Knowledge Engineering (3)

This course covers knowledge of engineering and its applications. The topics cover designs, developments and integrations of information systems and technologies to construct knowledge. Students will learn about fundamental knowledge representation and reasoning, knowledge modeling, knowledge acquisition, and evolution.

HCMG 5100. Health Systems Administration (3)

This course will provide administrative concepts and theories within United States health care systems. The history and evolution of the systems will be discussed, and the current state of health care delivery will be analyzed. The political, legal, and financial issues that impact health care will be considered. The course will discuss and assess the different types of health care providers and their roles in the systems.

HCMG 6100. Information Mgmt.-Health Care (3)

This course will provide an understanding of the different information systems designed to improve health care delivery and their use in the management of health care organizations. Students will examine the current status of information systems within health care and also explore possible advanced uses of informational systems to monitor patient outcomes, financial stability and marketing information.