



## GRADUATE STUDENTS' HANDBOOK



SCHOOL OF INFORMATION  
TECHNOLOGY AND  
COMPUTING (SITC)

# SCHOOL OF INFORMATION TECHNOLOGY AND COMPUTING

## Graduate Programs

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## Introduction

The School of Information Technology and Computing (SITC) at the American University of Nigeria (AUN) offers a suite of graduate programs designed to develop leaders, innovators, and researchers in computing and information systems. Our graduate programs include:

- Master of Science Computer Science (M.Sc.)
- Master of Science Information Systems (M.Sc.)
- Master of Science Data Science and Analytics (M.Sc.)
- Doctor of Philosophy Computer Science (Ph.D.)
- Doctor of Philosophy Information Systems (Ph.D.)
- Master of Information and Communication Science (MICS)

The School's graduate education philosophy is rooted in AUN's identity as a *development university* committed to shaping professionals who advance knowledge, foster innovation, and contribute to the social, economic, and technological development of Nigeria, Africa, and the global community. Our programs emphasize a project- and research-oriented approach, integrating rigorous coursework with applied learning, collaborative inquiry, and ethical practice. Students are encouraged to engage closely with faculty and peers, leveraging mentorship, seminars, and collaborative projects to deepen their understanding, develop practical skills, and contribute to cutting-edge research.

Through this approach, graduates are equipped to solve real-world problems, advance the frontiers of knowledge in their respective fields, and champion AUN's mission by driving sustainable development, promoting technological innovation, and shaping the next generation of leaders, scholars, and innovators. The School fosters an environment that nurtures intellectual curiosity, professional growth, and a commitment to creating meaningful impact locally, regionally, and globally.

## **Master of Science (M.Sc.) in Data Science and Analytics**

### **Program Philosophy**

The Master of Science in Data Science and Analytics is aligned with the American University of Nigeria's mission as a *development university* committed to preparing the next generation of African leaders through technology-driven education and innovation. The program is designed to produce data science professionals who combine advanced technical competence with critical thinking, ethical responsibility, and a strong capacity to address social and economic challenges within Nigeria, Africa, and the global community.

The program reflects AUN's American educational identity at the graduate level through a strong emphasis on project-based learning, continuous assessment, practical application, and active student engagement. Core coursework in programming, statistics, machine learning, enterprise data management, analytics, and visualization ensures that students acquire both depth and breadth in data science competencies relevant to modern organizations.

Consistent with AUN's commitment to sustainability and community development, the program emphasizes the responsible use of data to support evidence-based decision-making and inclusive development. Through applied analytics, case studies, and experiential learning, graduates are prepared to provide leadership and innovative solutions that advance economic growth and contribute to the achievement of the United Nations Sustainable Development Goals.

### **Program Aims**

The M.Sc. in Data Science and Analytics aims to:

- Produce highly competent data science professionals equipped with advanced analytical, computational, and problem-solving skills.
- Develop ethical, innovative, and socially responsible leaders who can apply data-driven solutions to complex societal and economic challenges.
- Support national and regional development by preparing graduates capable of driving evidence-based decision-making across key sectors in Nigeria and Africa.
- Foster research, innovation, and entrepreneurship in data science aligned with global best practices and U.S. accreditation standards.
- Contribute to AUN's public mission by leveraging data science for sustainable development and community impact.

### **Program Objectives**

Upon completion of the program, graduates will be able to:

- Apply programming tools such as Python and R to analyze, process, and interpret complex datasets.
- Design, implement, and manage enterprise-level database systems for analytical and operational use.
- Apply statistical and time series techniques to support data-driven analysis and forecasting.

- Develop and evaluate machine learning models for predictive and analytical applications.
- Communicate analytical insights effectively using appropriate data visualization techniques.
- Apply systematic, project-oriented approaches to solving real-world data problems.
- Analyze practical data challenges using case-based and applied analytics methods.
- Demonstrate professional ethics, teamwork, and leadership in data-driven environments.
- Apply data science and analytics to support sustainability initiatives and development priorities.

### **Degree Requirements**

The Master of Science in Data Science and Analytics program requires a minimum of 36 credit hours made up as follows:

- |  |                        |
|--|------------------------|
| • 8 Core Courses (3 credit hours each)     | 24 Credit Hours        |
| • 2 Elective Courses (3 credit hours each) | 6 Credit Hours         |
| • Thesis (completed over two semesters)    | 6 Credit Hours         |
| <b>Total:</b>                              | <b>36 Credit Hours</b> |

### **Course Courses (24 Credit Hours)**

DSC 801 Programming & Data Analytics with Python and R (3 Credit Hours)

DSC 802 Enterprise Database Management (3 Credit Hours)

DSC 803 Statistics & Time Series Analysis (3 Credit Hours)

DSC 804 Data Science & Analytics (3 Credit Hours)

DSC 805 Machine Learning (3 Credit Hours)

DSC 806 Data Visualization (3 Credit Hours)

DSC 807 Data Science Research Methods (3 Credit Hours)

DSC 809 Case Studies in Data Science (3 Credit Hours)

### **Elective Courses (Choose 2 – 6 Credit Hours)**

DSC 810 Business Intelligence (3 Credit Hours)

DSC 814 Cybersecurity Management (3 Credit Hours)

DSC 815 Cloud Computing & Big Data (3 Credit Hours)

DSC 818 Case Studies in Data Science (3 Credit Hours)

### **Research Project (6 Credit Hours)**

DSC 888 M.Sc. Thesis (6 Credit Hours)

**Publication Requirements:** Students are expected to publish a minimum of one conference paper or journal article before the internal defense.

### M.Sc. Data Science and Analytics Program Outline

| Year          | Semester  | Suggested Courseload                 | Credit Hours    | Program   |
|---------------|---|--------------------------------------|-----------------|---|
| 1             | Semester 1  | 4 Courses                            | 12 Credit Hours | Coursework  |
|               | Semester 2  | 4 Courses                            | 12 Credit Hours |   |
|               | Intersession (optional - students may carry course work over to 3rd semester) | 2 Courses                            | 6 Credit Hours  |   |
| 2             | Semester 3  | DSC 888                              | 6 Credit Hours  | Research Proposal, Thesis Submission, and Defense |
| <b>Total:</b> |   | <b>10 courses + Research Project</b> | <b>36</b>       |   |

## **Master of Science (M.Sc.) in Computer Science**

### **Philosophy**

The Master of Science in Computer Science is designed in alignment with the American University of Nigeria's mission as a *development university* committed to educating leaders who apply technology to advance social and economic progress. The program prepares graduates with advanced theoretical knowledge, practical skills, and ethical awareness necessary to address complex computing challenges within Nigeria, Africa, and the global digital economy.

The program reflects AUN's American graduate education model through rigorous coursework, project-oriented learning, continuous assessment, and close faculty–student engagement. Core courses in algorithms, software engineering, computer architecture, cloud and distributed systems, artificial intelligence, programming languages, and database systems provide a strong foundation in both the theoretical and applied dimensions of computer science.

A required research project serves as a capstone academic experience, enabling students to integrate advanced concepts, explore emerging technologies, and demonstrate independent problem-solving and scholarly inquiry. The program supports AUN's public mission by emphasizing innovation, sustainability, and the use of computing technologies to support development, strengthen institutions, and foster economic growth. Graduates are prepared for advanced professional roles in industry, government, and technology-driven organizations, as well as for further academic study and research.

### **Program Aims**

The Master of Science in Computer Science aims to:

- Advance the mission of the American University of Nigeria by developing highly skilled computer science professionals capable of contributing to technological and socio-economic development.
- Prepare graduates for leadership roles in computing and technology-driven sectors in Nigeria, Africa, and the global community.
- Provide advanced education in computer science that meets international standards and reflects best practices associated with American graduate education.
- Equip students with strong analytical, design, and problem-solving skills applicable to complex real-world computing challenges.
- Support innovation, entrepreneurship, and sustainable development through the application of advanced computing technologies.
- Prepare graduates for both professional careers and further academic study in computer science and related fields.

### **Program Objectives**

Upon completion of the program, graduates will be able to:

- Apply advanced algorithmic techniques and computational theory to analyze and solve complex computing problems.

- Design, develop, and evaluate robust software systems using modern software engineering principles and practices.
- Analyze and apply advanced concepts in computer architecture, operating systems, and distributed computing environments.
- Design and implement cloud-based and distributed systems that support scalability, performance, and reliability.
- Apply advanced programming language concepts and paradigms to the development of efficient and maintainable software solutions.
- Analyze and apply concepts from artificial intelligence and intelligent systems to real-world applications.
- Design and manage advanced database systems to support complex data-driven applications.
- Conduct independent scholarly inquiry through a supervised research project, demonstrating critical analysis, technical depth, and academic rigor.
- Communicate technical ideas, designs, and findings effectively to both technical and non-technical audiences.
- Demonstrate professional ethics, teamwork, and leadership in advanced computing environments.
- Apply computing knowledge and skills to support sustainable development, innovation, and community impact in alignment with AUN's mission.

## Degree Requirements

The Master of Science in Computer Science program requires a minimum of 36 credit hours made up as follows:

- |  |                        |
|--|------------------------|
| • 8 Core Courses (3 credit hours each)     | 24 Credit Hours        |
| • 2 Elective Courses (3 credit hours each) | 6 Credit Hours         |
| • Thesis (completed over two semesters)    | 6 Credit Hours         |
| <b>Total:</b>                              | <b>36 Credit Hours</b> |

### Core Courses (8 Courses – 24 Credit Hours)

CSC 802 Research Directions & Computer Engineering Methodology (3 Credit Hours)  
 CSC 803 Advanced Computer Algorithms (3 Credit Hours)  
 CSC 804 Software Engineering Principles & Practices (3 Credit Hours)  
 CSC 847 Advanced Computer Architecture (3 Credit Hours)  
 CSC 849 Cloud & Distributed Computing (3 Credit Hours)  
 CSC 852 Advanced Programming Language Principles I (3 Credit Hours)  
 CSC 867 Topics in Database Systems (3 Credit Hours)  
 CIE 856 Topics in Artificial Intelligence (3 Credit Hours)

### Elective Courses (Choose 2 – 6 Credit Hours)

CSC 801 – Advanced Operating Systems (3 Credit Hours)  
 CSC 805 – Computer Communications & Network (3 Credit Hours)  
 CSC 835 - User Interface Design (3 Credit Hours)  
 CSC 865 – Cryptography & Computer Security (3 Credit Hours)  
 CSC 874 – Topics in XML & Web Intelligence (3 Credit Hours)

## Research Project (6 Credit Hours)

CSC 899 Research Project

**Publication Requirements:** Students are expected to publish a minimum of one conference paper or journal article before the internal defense.

### M.Sc. Computer Science Program Outline

| Year          | Semester  | Suggested Courseload                 | Credit Hours    | Program   |
|---------------|---|--------------------------------------|-----------------|---|
| 1             | Semester 1  | 4 Courses                            | 12 Credit Hours | Coursework  |
|               | Semester 2  | 4 Courses                            | 12 Credit Hours |   |
|               | Intersession (optional - students may carry course work over to 3rd semester) | 2 Courses                            | 6 Credit Hours  |   |
| 2             | Semester 3  | DSC 888                              | 6 Credit Hours  | Research Proposal, Thesis Submission, and Defense |
| <b>Total:</b> |   | <b>10 courses + Research Project</b> | <b>36</b>       |   |

## **Master of Science (M.Sc.) in Information Systems**

### **Philosophy**

The Master of Science in Information Systems program is aligned with the American University of Nigeria's mission as a *development university* dedicated to preparing leaders who use technology to advance social, economic, and institutional development. The program is designed to produce information systems professionals who can bridge the gap between technology and organizational strategy while addressing real-world challenges faced by businesses, governments, and communities in Nigeria, Africa, and the global economy.

The program reflects AUN's American graduate education identity through project-oriented learning, continuous assessment, collaborative problem-solving, and close engagement with faculty and industry-relevant practices. Core courses integrate information systems, cybersecurity, data analytics, artificial intelligence, accounting information systems, and strategic IT management to prepare graduates for leadership roles in complex, technology-driven organizations.

Emphasizing applied learning and practical impact, the program equips students to design, manage, and evaluate information systems that improve organizational effectiveness, enhance transparency, and support innovation. Through applied projects, case studies, and methodological training, students develop the capacity to solve real-world problems and generate solutions with meaningful impact on local communities, regional development, and global competitiveness, in alignment with the United Nations Sustainable Development Goals and AUN's public mission.

### **Program Aims**

This Master's program aims to:

- Advance the mission of the American University of Nigeria by developing information systems professionals capable of driving organizational and societal development through technology.
- Prepare graduates to design and manage information systems that address real-world business, governmental, and community challenges in Nigeria, Africa, and beyond.
- Develop leaders who can align information technology strategies with organizational goals to support economic growth, efficiency, and innovation.
- Deliver graduate-level education in information systems that meets international standards and reflects best practices associated with American higher education.
- Promote ethical, secure, and sustainable use of information systems to strengthen institutions and support community impact.
- Prepare graduates for advanced professional careers and further academic study in information systems and related fields.

### **Program Objectives**

Upon completion of the program, graduates will be able to:

- Apply systematic and analytical approaches to identify, analyze, and solve real-world information systems problems.

- Design, develop, and manage information systems projects using established systems development and project management methodologies.
- Align business strategy with information technology strategy to enhance organizational performance and competitiveness.
- Apply cybersecurity principles to protect organizational information assets and ensure data integrity, confidentiality, and availability.
- Utilize data science, business analytics, and data mining techniques to support evidence-based decision-making.
- Apply artificial intelligence applications to improve business processes, organizational intelligence, and service delivery.
- Design and manage database systems that support enterprise-level information needs.
- Apply management accounting and accounting information systems concepts to support financial decision-making and organizational accountability.
- Demonstrate effective communication, teamwork, and leadership in multidisciplinary and technology-driven environments.
- Apply ethical and professional standards in the design and use of information systems.
- Evaluate the social, economic, and organizational impact of information systems solutions on local, regional, and global communities.

### **Degree Requirements**

The Master of Science in Information Systems program requires a minimum of 36 credit hours made up as follows:

- |  |                        |
|--|------------------------|
| • 8 Core Courses (3 credit hours each)     | 24 Credit Hours        |
| • 2 Elective Courses (3 credit hours each) | 6 Credit Hours         |
| • Thesis (completed over two semesters)    | 6 Credit Hours         |
| <b>Total:</b>                              | <b>36 Credit Hours</b> |

### **Core Courses (8 Courses – 24 Credit Hours)**

INF 801 Research Directions & Methodology in IS (3 Credit Hours)  
 INF 805 Business-IT Alignment Strategy (3 Credit Hours)  
 INF 807 Cybersecurity (3 Credit Hours)  
 INF 821 Artificial Intelligent Application for Business (3 Credit Hours)  
 INF 831 Database Management (3 Credit Hours)  
 INF 834 Systems Development & Project Management (3 Credit Hours)  
 INF 841 Management Accounting & Accounting Information Systems (3 Credit Hours)  
 INF 851 Data Science & Business Analytics (3 Credit Hours)

### **Elective Courses (Choose 2 – 6 Credit Hours)**

CIE 800 Model Thinking (3 Credit Hours)  
 INF 810 Introduction to Enterprise Computing Environments (3 Credit Hours)  
 INF 812 Data Mining for Business Intelligence (3 Credit Hours)  
 INF 855 Organizational Behavior (3 Credit Hours)

## Research Project (6 Credit Hours)

INF 899 Research Project

**Publication Requirements:** Students are expected to publish a minimum of one conference paper or journal article before the internal defense.

### M.Sc. Information Systems Program Outline

| Year          | Semester  | Suggested Courseload                 | Credit Hours    | Program   |
|---------------|---|--------------------------------------|-----------------|---|
| 1             | Semester 1  | 4 Courses                            | 12 Credit Hours | Coursework  |
|               | Semester 2  | 4 Courses                            | 12 Credit Hours |   |
|               | Intersession (optional - students may carry course work over to 3rd semester) | 2 Courses                            | 6 Credit Hours  |   |
| 2             | Semester 3  | DSC 888                              | 6 Credit Hours  | Research Proposal, Thesis Submission, and Defense |
| <b>Total:</b> |   | <b>10 courses + Research Project</b> | <b>36</b>       |   |

## **Doctor of Philosophy (Ph.D.) in Computer Science**

### **Philosophy**

The Doctor of Philosophy in Computer Science is aligned with the American University of Nigeria's mission as a *development university* dedicated to advancing knowledge, innovation, and leadership through technology. The program is designed to prepare the next generation of scholars, researchers, and academic leaders who will expand the frontiers of computer science while addressing critical development challenges in Nigeria, Africa, and the global digital economy.

Reflecting AUN's American doctoral education philosophy, the program emphasizes rigorous theoretical foundations, advanced methodological training, continuous scholarly engagement, and close faculty mentorship. Core coursework in algorithms, artificial intelligence, computer architecture, optimization, programming languages, databases, and advanced statistical methods provides students with deep disciplinary competence and the analytical rigor required for original research.

A central component of the program is sustained doctoral research culminating in a dissertation that makes a significant and original contribution to computer science. Dynamic doctoral seminars are integrated throughout the program to promote intellectual exchange, interdisciplinary collaboration, and scholarly community. These seminars provide structured opportunities for students to present ongoing research, receive critical feedback, and develop publishable work in collaboration with faculty and fellow doctoral candidates.

Consistent with AUN's public mission, the program encourages research that advances technological innovation, strengthens institutions, and supports sustainable development, while preparing graduates for leadership roles in academia, research institutions, industry, and policy environments worldwide.

### **Program Aims**

The Ph.D. in Computer Science aims to:

- Advance the mission of the American University of Nigeria by producing scholars who contribute to technological innovation and development through original research.
- Prepare graduates for academic careers in teaching and research at universities and advanced research institutions.
- Develop global research leaders capable of shaping the future direction of computer science theory and practice.
- Promote cutting-edge research aligned with international standards and best practices associated with American doctoral education.
- Foster interdisciplinary collaboration and scholarly dissemination through sustained seminar engagement and publication.
- Support research that addresses regional, national, and global challenges through advanced computing technologies.

## Program Objectives

Graduates of the program will be able to:

- Demonstrate mastery of advanced computer science theory, methods, and emerging research areas.
- Formulate original research problems and design rigorous methodologies to investigate them.
- Conduct independent, high-quality doctoral research that contributes new knowledge to the field of computer science.
- Publish scholarly research in reputable peer-reviewed journals and conferences.
- Present research effectively in academic seminars, conferences, and professional forums.
- Apply advanced statistical, optimization, and computational techniques to complex research problems.
- Mentor junior researchers and contribute to teaching and curriculum development in higher education.
- Collaborate effectively with interdisciplinary research teams at local, regional, and international levels.
- Apply ethical standards and professional responsibility in advanced research and technological innovation.
- Leverage computer science research to support sustainable development and institutional capacity-building.

## Ph.D. Degree Requirements

The Doctor of Philosophy in Computer Science requires a minimum of 54 credit hours made up as follows:

- |  |                        |
|--|------------------------|
| • 8 Core Courses (3 credit hours each)     | 24 Credit Hours        |
| • 2 Elective Courses (3 credit hours each) | 6 Credit Hours         |
| • Thesis (completed over four semesters)   | 24 Credit Hours        |
| <b>Total:</b>                              | <b>54 Credit Hours</b> |

## Core Courses (8 Courses – 24 Credit Hours)

CIE 951 Probability & Statistics Theory (3 Credit Hours)

CIE 956 Artificial Intelligence & Applications (3 Credit Hours)

CSC 901 Advanced Research Directions & Computer Engineering Methodology (3 Credit Hours)

CSC 903 Advanced Computer Algorithms II (3 Credit Hours)

CSC 947 Advanced Computer Architecture (3 Credit Hours)

CSC 952 Advanced Programming Language Principles II (3 Credit Hours)

CSC 958 Optimization for Machine Learning (3 Credit Hours)

CSC 967 Advanced Topics in Database Systems (3 Credit Hours)

**Electives (Choose 2 – 6 Credit Hours)**

- CIE 952 Advanced Statistical Methods (3 Credit Hours)
- CSC 949 Cloud & Distributed Computing (3 Credit Hours)
- CSC 951 Applied Cryptography (3 Credit Hours)
- INF 907 Big Data Analytics & Digital Platforms (3 Credit Hours)
- INF 910 IT Project Management and Enterprise Resource Planning Systems (3 Credit Hours)

**Research Project (24 Credit Hours)**

CSC 999 Research Project

**Publication Requirements:** Students are expected to publish at least 2 papers before their internal defense either through a conference or academic journal, with at least 1 being a journal publication.

**Ph.D. Computer Science Outline**

| Year                          | Semester  | Suggested Courseload | Credit Hours    | Program  |
|-------------------------------|---|----------------------|-----------------|--|
| 1                             | Semester 1  | 4 Courses            | 12 Credit Hours | Coursework   |
|                               | Semester 2  | 4 Courses            | 12 Credit Hours |  |
|                               | Intersession<br>(optional -<br>students may carry<br>course work over<br>to 3rd semester) | 0-2 Courses          | 0-6 Credits     |  |
| 2                             | Semesters 3 & 4   | CSC 999              | 24 Credit Hours | Comprehensive Exam,<br>Proposal Defense and<br>Starting of Research<br>Project |
| 3                             | Semesters 5 & 6   |                      |                 | Seminar I  |
|                               |   |                      |                 | Seminar II   |
| <b>Total: 54 Credit Hours</b> |   |                      |                 | Internal and External<br>Defense of Thesis                                     |

## **Doctor of Philosophy (Ph.D.) in Information Systems**

### **Philosophy**

The Doctor of Philosophy in Information Systems is aligned with the American University of Nigeria's mission as a *development university* committed to leadership, innovation, and societal transformation through technology. The program prepares advanced scholars and educators who generate, integrate, and apply knowledge at the intersection of information systems, organizations, and society.

Grounded in AUN's American doctoral education model, the program emphasizes rigorous theoretical inquiry, design science research, advanced methodological training, and sustained scholarly productivity. Core coursework in information systems theory, systems analysis and design, database systems, enterprise platforms, artificial intelligence, and advanced quantitative and qualitative methods equips students to conduct impactful and interdisciplinary research.

Doctoral research culminates in a dissertation that advances theory and practice in information systems, with particular attention to digital transformation, governance, innovation, and development contexts. Dynamic doctoral seminars are embedded throughout the program to foster scholarly dialogue, peer learning, and collaboration. These seminars provide structured opportunities for students to present research-in-progress, engage with faculty mentorship, and develop publications, consistent with the program's requirement for peer-reviewed dissemination prior to dissertation defense.

The program supports AUN's public mission by encouraging research that strengthens institutions, enhances transparency, improves organizational performance, and advances sustainable development in Nigeria, Africa, and the global knowledge economy.

### **Program Aims**

The Ph.D. in Information Systems aims to:

- Advance AUN's mission by developing research leaders who use information systems scholarship to support development and institutional effectiveness.
- Prepare graduates for academic careers in teaching, research, and scholarly leadership in information systems.
- Generate original research that advances information systems theory, design, and practice.
- Promote high-impact scholarship aligned with international research standards and American doctoral education traditions.
- Foster sustained scholarly engagement, collaboration, and publication through structured doctoral seminars.
- Support research that addresses digital transformation challenges in local, regional, and global contexts.

## Program Objectives

Graduates of the program will be able to:

- Demonstrate advanced mastery of information systems theories, philosophies, and research paradigms.
- Design and conduct rigorous quantitative, qualitative, and design science research in information systems.
- Produce original doctoral research that advances knowledge in information systems and related fields.
- Publish scholarly work in reputable peer-reviewed journals and conferences.
- Present and defend research effectively in academic and professional settings.
- Analyze and evaluate complex organizational and societal challenges using information systems perspectives.
- Contribute to curriculum development and teaching in higher education institutions.
- Collaborate across disciplines to address complex digital and development challenges.
- Apply ethical standards and scholarly integrity in advanced research and publication.
- Use information systems research to support sustainable development, digital governance, and organizational innovation.

## Ph.D. Degree Requirements

The Doctor of Philosophy in Information Systems requires a minimum of 54 credit hours made up as follows:

- |  |                        |
|--|------------------------|
| • 8 Core Courses (3 credit hours each)     | 24 Credit Hours        |
| • 2 Elective Courses (3 credit hours each) | 6 Credit Hours         |
| • Thesis (completed over four semesters)   | 24 Credit Hours        |
| <b>Total:</b>                              | <b>54 Credit Hours</b> |

### Core Courses (8 Courses – 24 Credit Hours)

INF 901 Advanced Research Directions & Methodology in IS (3 Credit Hours)  
INF 902 Advanced Systems Analysis & Design (3 Credit Hours)  
INF 903 Design Science Research Methodology (3 Credit Hours)  
INF 904 IS Theory Development & Philosophy (3 Credit Hours)  
INF 906 Advanced Database Management Systems & Web Technologies (3 Credit Hours)  
INF 910 IT Project Management & Enterprise Resource Planning Systems (3 Credit Hours)  
CIE 953 Statistics Theory, Regression & Multivariate Data Analysis (3 Credit Hours)  
CIE 956 Artificial Intelligence & Applications (3 Credit Hours)

### Electives (Choose Two – 6 Credit Hours)

CIE 912 E-Business, Fintech & Block Chain Technology (3 Credit Hours)  
INF 907 Big Data Analytics & Digital Platforms (3 Credit Hours)  
INF 950 Advanced Qualitative Research Methodology (3 Credit Hours)  
INF 962 Cybersecurity & Network Technologies (3 Credit Hours)

## Research Project (24 Credit Hours)

INF 999 Research Project/Thesis

**Publication Requirements:** Students are expected to publish at least 2 papers before their internal defense either through a conference or academic journal, with at least 1 being a journal publication.

## Ph.D. Information Systems Outline

| Year                          | Semester  | Suggested Courseload | Credit Hours    | Program  |
|-------------------------------|---|----------------------|-----------------|--|
| 1                             | Semester 1  | 4 Courses            | 12 Credit Hours | Coursework   |
|                               | Semester 2  | 4 Courses            | 12 Credit Hours |  |
|                               | Intersession<br>(optional -<br>students may carry<br>course work over<br>to 3rd semester) | 0-2 Courses          | 0-6 Credits     |  |
| 2                             | Semesters 3 & 4   | INF 999              | 24 Credit Hours | Comprehensive Exam,<br>Proposal Defense and<br>Starting of Research<br>Project |
| 3                             | Semesters 5 & 6   |                      |                 | Seminar I  |
|                               |   |                      |                 | Internal and External<br>Defense of Thesis                                     |
| <b>Total: 54 Credit Hours</b> |   |                      |                 |  |

## **Master of Information and Communication Science (MICS)**

### **Philosophy**

The Master of Information and Communication Science program is aligned with the American University of Nigeria's mission as a *development university* dedicated to educating leaders who apply information and communication technologies to advance social, economic, and institutional development. The program prepares graduates to design, manage, and innovate within complex digital systems that support organizations, communities, and economies in Nigeria, Africa, and the global information society.

The program reflects AUN's American graduate education identity through rigorous coursework, project-oriented learning, continuous assessment, and strong engagement with contemporary industry and research-driven practices. Core courses in management information systems, enterprise databases, systems analysis and design, project management, networking, cybersecurity, cloud computing, and emerging technologies provide students with a comprehensive and forward-looking foundation in information and communication systems.

Emphasizing innovation and applied problem-solving, the program equips students to leverage cutting-edge technologies—particularly artificial intelligence, cloud platforms, data analytics, and secure networked systems—to address real-world challenges. Through applied projects, analytical inquiry, and experiential learning, graduates develop solutions with meaningful impact on local communities, regional development, and global competitiveness, consistent with AUN's public mission and its commitment to sustainable development.

### **Program Aims**

The Master of Information and Communication Science aims to:

- Advance the mission of the American University of Nigeria by developing ICT professionals who contribute to socio-economic development through innovation and technological leadership.
- Prepare graduates to design, implement, and manage modern information and communication systems that address real-world challenges in organizations and communities.
- Foster the application of emerging and disruptive technologies to support institutional effectiveness, economic growth, and digital transformation.
- Deliver graduate education in information and communication science that meets international standards and reflects best practices associated with American higher education.
- Promote ethical, secure, and sustainable use of information and communication technologies in support of development goals.
- Prepare graduates for advanced professional careers and further study in information and communication science and related fields.

## Program Objectives

Upon completion of the program, graduates will be able to:

- Analyze organizational and societal information needs and design appropriate information and communication system solutions.
- Design, implement, and manage management information systems and enterprise database solutions.
- Apply systems analysis and design methodologies to develop efficient, scalable, and user-centered systems.
- Plan, execute, and evaluate ICT projects using established project management principles and tools.
- Apply emerging technologies, including artificial intelligence applications, to enhance business processes and organizational decision-making.
- Design and manage network architectures and communication protocols that support secure and reliable information exchange.
- Apply cybersecurity principles to protect information assets and ensure system resilience.
- Design and manage cloud computing and virtualization environments to support modern digital infrastructures.
- Apply data analytics and visualization techniques to support evidence-based decision-making.
- Demonstrate effective communication, teamwork, and leadership in multidisciplinary ICT environments.
- Evaluate the social, economic, and ethical implications of information and communication technologies on local, regional, and global communities.

## Degree Requirements

The Master of Science in Information Systems program requires a minimum of 36 credit hours made up as follows:

- 8 Core Courses (3 credit hours each) 24 Credit Hours
- 2 Elective Courses (3 credit hours each) 6 Credit Hours
- Thesis (completed over two semesters) 6 Credit Hours
- Total: 36 Credit Hours**

### Core Courses (8 Courses – 24 Credit Hours)

ICT 803 Management Information System (3 Credit Hours)  
ICT 804 Enterprise Database Management (3 Credit Hours)  
ICT 808 System Analysis & Design (3 Credit Hours)  
ICT 809 IT Project Management (3 Credit Hours)  
ICT 812 Emerging Technology (AI application to Business) (3 Credit Hours)  
ICT 814 Network Architecture & Protocols (3 Credit Hours)  
ICT 816 Cybersecurity Fundamentals (3 Credit Hours)  
ICT 817 Cloud Computing & Virtualization (3 Credit Hours)

**Electives (Choose 2 – 6 Credit Hours)**

ICT 801 System Dynamics (3 Credit Hours)

ICT 802 Web Application Development &amp; E-Commerce (3 Credit Hours)

ICT 818 Data Analytics &amp; Visualization (3 Credit Hours)

ICT 855 Organizational Behavior (3 Credit Hours)

**Research Project (Credit Hours)**

ICT 899 Research Project (6 Credit Hours)

**Publication Requirements:** Students are expected to publish a minimum of one conference paper or journal article before the internal defense.**Master of Information and Communication Science (MICS) Computer Science Program Outline**

| Year          | Semester  | Suggested Courseload                 | Credit Hours    | Program   |
|---------------|---|--------------------------------------|-----------------|---|
| 1             | Semester 1  | 4 Courses                            | 12 Credit Hours | Coursework  |
|               | Semester 2  | 4 Courses                            | 12 Credit Hours |   |
|               | Intersession (optional - students may carry course work over to 3rd semester) | 2 Courses                            | 6 Credit Hours  |   |
| 2             | Semester 3  | DSC 888                              | 6 Credit Hours  | Research Proposal, Thesis Submission, and Defense |
| <b>Total:</b> |   | <b>10 courses + Research Project</b> | <b>36</b>       |   |

## **Course Descriptions**

### **Computing and Information Engineering (CIE)**

#### **CIE 800 Model Thinking**

The objective of this course is first to introduce the general concept of models. What are models? Are there different types of models? Who uses models? Why are models useful? This introduction to models also serves to discuss the concept of system, complexity, simulation and optimization. Also addressed is the role of models as tools to understand system behavior and decipher complexity. The second purpose of the course is to present and illustrate with examples of applications the main categories of models: statistical models, agent-based models, simulation models, game theory and optimization models. The third and last objective is to select one or two specific model types and practice both model building and use with real life examples of applications. (3 Credit Hours)

#### **INF 801 Research Directions & Methodology in IS**

This course aims to equip research students with the necessary foundations and skills to evaluate and perform qualitative research at a postgraduate level. Course Description: Three semester hours. This course offers an overview of research methodology including basic concepts employed in quantitative and qualitative research methods includes computer applications for research. (3 Credit Hours)

#### **CIE 856 Topics in Artificial Intelligence**

This course aims to provide graduate students with the ability to develop a systematic understanding of the artificial intelligence domain and the associated research skills. The course includes advanced topics that will allow the students to plan, design and implement appropriate AI solutions in practical scenarios. This course includes advanced topics in artificial intelligence techniques, natural language processing, machine learning, stochastic algorithms, game theory, automated theorem proving, computer vision, and human-like computation. (3 Credit Hours)

#### **CSC 901 Advanced Research Directions & Computer Engineering Methodology**

This doctoral-level course provides an advanced examination of research methodologies in computer science and engineering, integrating both traditional scientific inquiry and contemporary knowledge engineering approaches. Students will critically engage with methodologies for algorithmic analysis, theoretical modelling, large-scale simulation, and empirical validation, alongside structured knowledge engineering frameworks such as CommonKADS, ontology-driven modelling, and methods for knowledge acquisition, representation, and reasoning. Emphasis is placed on evaluating methodological assumptions, designing research that bridges theory and practice, and developing innovative frameworks for emerging domains such as distributed systems, cybersecurity, artificial intelligence, and machine learning. Through seminars, case analyses, and research design exercises, students will learn to align complex research problems with appropriate methodologies, defend their methodological choices, and position their work within global debates in computing. By the end of the course, candidates will be equipped not only to apply advanced methodologies but also to extend or adapt them, thereby contributing new research practices and frameworks to the discipline. (3 Credit Hours)

### **CIE 912 E-Business, Fintech & Block Chain Technology**

This course examines the convergence of electronic business models, financial technologies, and blockchain systems in transforming modern commerce and financial services. It explores how digital platforms, data-driven technologies, and decentralized systems reshape value creation, payment systems, financial inclusion, and organizational processes in both developed and emerging economies. Key topics include e-business architectures and digital platforms, online payment systems, digital banking and financial services, mobile money, peer-to-peer lending, and FinTech innovation ecosystems. The course also introduces blockchain fundamentals, distributed ledger technologies, smart contracts, cryptocurrencies, and their applications in finance, supply chains, and digital identity. Strategic, regulatory, ethical, and security issues—such as data protection, consumer trust, compliance, and governance—are critically examined. Through case studies, applied analysis, and technology-focused discussions, students develop the analytical capacity to evaluate, design, and manage digital business and FinTech solutions in rapidly evolving digital economies. (3 Credit Hours)

### **CIE 951 Probability & Statistics Theory**

This course will explore several advanced topics in probability and statistics theory. Some of the topics covered in this course include conditional probability, independence, distributed random variables, conditional distributions, independent random variables, central limit theorems for independent and non-identically distributed random variables, stable and infinitely divisible distributions, discrete time martingales and applications. The focus of this course will be on discussing ongoing research, as well as important results that have recently appeared in the literature. (3 Credit Hours)

### **CIE 952 Advanced Statistical Methods**

This course will cover advanced statistical topics including confirmatory factor analysis, structural equations models, generalized linear models, multilevel methods, social network analysis, support vector machines, and correspondence analysis. This course will cover the various experimental and observational research designs and address more advanced designs, such as nested designs, quasi-experimental, and cross-over designs. Students will evaluate the statistical methods adopted in several articles published in high impact journals in the domain of computer science. (3 Credit Hours)

### **CIE 953 Statistics Theory, Regression & Multivariate Data Analysis**

This course provides an advanced treatment of statistical theory and quantitative data analysis techniques used in empirical research in information systems, business, engineering, and the social sciences. It integrates theoretical foundations of statistical inference with applied regression, multivariate analysis, and structural equation modelling approaches for analyzing complex and theory-driven datasets. Key topics include probability theory, statistical distributions, estimation and hypothesis testing, linear and multiple regression analysis, and model diagnostics. The course extends to multivariate techniques such as factor analysis, principal component analysis, cluster analysis, discriminant analysis, and multivariate analysis of variance. A significant component of the course is devoted to Structural Equation Modelling (SEM), including covariance-based SEM and Partial Least Squares Structural Equation Modelling (PLS-SEM). Students learn measurement and structural model specification, reliability and validity assessment, mediation and moderation analysis, model fit and predictive assessment, and interpretation of results. Emphasis is placed on appropriate method selection, robustness, and ethical quantitative analysis. Through applied exercises and research-oriented projects, students develop the competence to design, estimate, and report advanced statistical models suitable for high-quality postgraduate and doctoral research. (3 Credit Hours)

### **CIE 956 Artificial Intelligence & Applications**

This course provides an advanced exploration of Artificial Intelligence (AI) theories, models, and applications across diverse domains such as business intelligence, engineering systems, healthcare, FinTech, and digital governance. Students will critically examine AI paradigms including machine learning, deep learning, knowledge representation, and intelligent agents. The course emphasizes both the technical and ethical dimensions of AI deployment, fostering the ability to design, evaluate, and apply AI-driven solutions to real-world problems. It also explores Artificial Intelligence (AI) as a transformative enabler of modern business strategy, operations, and innovation. It examines how AI technologies—such as machine learning, deep learning, natural language processing, and predictive analytics—are used to enhance decision-making, customer engagement, risk management, and business performance. Students critically analyze AI adoption within digital platforms, FinTech, supply chains, marketing, and organizational intelligence, while considering the ethical, social, and governance implications of AI-driven enterprises. (3 Credit Hours)

## **Computer Science (CSC)**

### **CSC 801 Advanced Operating Systems**

This course covers advanced issues of design and implementation of advanced modern operating systems. The focus of this course is on issues that are critical to the applications of distributed systems and computer networks, which include inter-process communication, distributed processing, sharing and replication of data and files. The topics covered in this course include the recent developments in operating systems research, advanced operating systems design, virtual memory management, virtualization, concurrency and synchronization, file systems, cloud systems, heterogeneity, and security. (3 Credit Hours)

### **CSC 802 Research Directions & Computer Engineering Methodology**

This course provides an in-depth exploration of research and methodological approaches in computer science and engineering, with emphasis on both scientific inquiry and knowledge engineering. Students will engage with traditional methodologies such as theoretical modelling, simulation, algorithmic analysis, and empirical validation, while also examining structured frameworks for knowledge-based system development, including CommonKADS, knowledge modelling techniques, and methodologies for knowledge acquisition and representation. The course highlights how these approaches can be applied across domains such as distributed systems, cybersecurity, artificial intelligence, and computer architecture. Practical components emphasize research proposal development, methodological alignment with research questions, reproducibility, and ethical considerations in computing research. By the end of the course, students will be able to critically evaluate methodological alternatives, apply knowledge engineering frameworks alongside conventional research strategies, and design rigorous, innovative studies that contribute to the advancement of computer science. (3 Credit Hours)

### **CSC 803 Advanced Computer Algorithms**

This course encapsulates the theoretical and practical aspects of design and analysis of algorithms including the functional descriptions of various parallel models of computations and the interconnection networks for multi-computers. The topics covered in this course includes flows in networks, linear programming, and NP-complete problems, coping with NP-

completeness, randomized algorithms, probabilistic arguments, dynamic programming, approximation algorithms, content distribution, and support vector machines. (3 Credit Hours)

### **CSC 804 Software Engineering Principles & Practices**

This course will cover the leading-edge techniques needed for analyzing, designing, implementing and maintaining complex mission-control software systems. This course includes several advanced concepts, including techniques, methods and methodologies appropriate for the development of large-scale object-oriented software applications and systems. The topics covered in this course include the conceptual foundations of the object-oriented approach, design patterns, design heuristics, software quality, testing and verification in safety-critical systems, and software development for mobile devices. (3 Credit Hours)

### **CSC 805 Computer Communications & Network**

This course covers the advanced topics in computer communications and networking domains. Some of the advanced topics covered in this course include data center operating systems, adaptation and dynamic control, self-managing/autonomic systems, energy-aware computing, trusted computing platforms, virtual machines, virtualization and hardware/software interface, network storage services and distributed data, scalable Internet services and cluster computing, and Infrastructure-as-a-Service (IaaS). (3 Credit Hours)

### **CSC 835 User Interface Design**

This graduate-level course focuses on the industry-standard theory and methods for developing successful user interfaces. This course includes advanced topics including prototyping and evaluation techniques necessary for creating intuitive interfaces that facilitate good user experiences, low-fidelity prototyping techniques, design patterns, action analysis, walkthroughs, and heuristic evaluation. This course will also include user testing, including learning from a series of advanced usability tests carried out in a usability lab. (3 Credit Hours)

### **CSC 847 Advanced Computer Architecture**

This course focuses on the underlying design principles of computer architecture and the impact of these principles on computer performance. This course covers several advanced computer architecture concepts including the architecture and organization of high-performance computers, principles of instruction sets, instruction level parallelism and multi-processors. The topics covered in this course include processor design, control design, memory organization, system organization, parallel processing, symmetric shared-memory architectures, multiprocessor cache coherence, and advanced optimizations to achieve cache performance. (3 Credit Hours)

### **CSC 849 Cloud & Distributed Computing**

The course covers the underlying principles of distributed and cloud computing, from applications and administration to programming and infrastructure. The key focus of this course is on parallel programming techniques for cloud computing and large scale distributed systems that form the cloud infrastructure. The topics covered in this course include cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, load balancing, caching, distributed transactions, identity and authorization management, security in the cloud, and multicore operating systems. This course includes a project using open-source implementations of highly available clustering computational environments to build very powerful and efficient applications. (3 Credit Hours)

### **CSC 852 Advanced Programming Language Principles 1**

This graduate-level course is designed to allow graduate students to critically examine and explore the design, implementation, and compilation of programming languages. This course is designed to broadly explore three areas: semantics, type systems, and research applications. This course will cover several topics including the complexity of an algorithm, methods on how to compute the running time of algorithms, syntax specification and informal semantic models, program control structures, including recursion, co-routines, backtracking, and concurrency, and data abstraction and structuring methods. The course introduces programming paradigms, such as functional and logic programming, that contrast with more conventional languages. (3 Credit Hours)

### **CSC 865 Cryptography & Computer Security**

This graduate-level course includes advanced topics in the domains of computer security and cryptography. The topics covered in this course include secret key cryptography, public-key cryptography, protocols, symmetric cryptography, digital signatures, cryptographic security, side-channel attacks, authentication mechanisms, authorization techniques, security models, trusted computing, network architecture security, operating system security, cryptography, database security, physical security, Web security and network security protocols. (3 Credit Hours)

### **CSC 867 Topics in Database Systems**

This graduate-level course focuses on the state-of-the-art data systems and data management techniques. This course covers advanced topics including approximate query processing, transactions, data exploration, visualization, distributed databases, big data analysis, time series data and anomaly detection and exploration in time series data. (3 Credit Hours)

### **CSC 874 Topics in XML & Web Intelligence**

This course introduces the fundamental concepts and technologies of Web Intelligence and the Semantic Web, focusing on how meaning and context can be embedded into web data to create intelligent, interconnected systems. Students begin with XML for structured data representation and progress to semantic technologies such as RDF, OWL, SPARQL, and knowledge graphs. The course explores their application in intelligent systems—including recommendation engines, smart assistants, and linked data platforms—while also addressing topics such as ontology design, web mining, and intelligent information retrieval. By the end of the course, students will be able to analyze and develop semantically aware web solutions and engage with emerging research in AI-driven web intelligence. (3 Credit Hours)

### **CSC 899 Research Project/M.Sc. Thesis**

This is the supervised research component of the M.Sc. program or a substantial literature review on a specific topic. It involves the conduct of an independent research project in Computer science, culminating in the submission and defense of an M.Sc. thesis that demonstrates the student's ability to apply appropriate theories, methods, and analytical techniques to a defined research problem. (6 Credit Hours)

### **CSC 903 Advanced Computer Algorithms II**

The design and analysis of algorithms is a key part of computer science. This course introduces students to advanced techniques for the design and complexity analysis of the algorithms. These algorithms will be evaluated and explored using a wide range of applications. Some of the key topics covered in this course include but are not limited to hashing, Markov chains, machine learning algorithms, load balancing, probabilistic analysis, linear programming,

amortization, randomization, fingerprinting, word-level parallelism, bit scaling, and dynamic programming. (3 Credit Hours)

### **CSC 947 Advanced Computer Architecture**

The emphasis of this course is on multicore and modern parallel processing computer systems. The topics covered in this course include memory system organization, principles for multiprocessor systems, memory, and cache coherence, multiprocessor architecture, computer architectures for servers and workstations, digital signal processors, architectures, GPU and non-volatile memory architectures, low-power architectures, application-specific processors, and system on chip architectures. Research areas and trends in the design of modern parallel processing architecture will be explored in this course. (3 Credit Hours)

### **CSC 949 Cloud & Distributed Computing**

Distributed systems and cloud computing allow the use of multiple computers and service-oriented architecture to build bigger and better systems. The topics covered in this course include the principles of distributed systems such as communication, naming, synchronization, fault tolerance, quorums, replicated state machines, atomic commit, and peer-to-peer systems. This is a research-oriented course with students demonstrating critical reflection on the progress that has been made on organizing distributed systems, and new topics such as peer-to-peer computing, sensor networks, web services, grid computing, virtualization, and cloud computing. (3 Credit Hours)

### **CSC 951 Applied Cryptography**

This is an applied course on advanced cryptography with a focus on the advances in modern cryptography techniques in various domains. The topics covered in this course include secret key cryptography, public-key cryptography, protocols, symmetric cryptography, digital signatures, cryptographic security, side-channel attacks, magical crypto tricks, zero-knowledge proofs, as well as research topics from scholarly research published in the last five years in high-impact journals. (3 Credit Hours)

### **CSC 952 Advanced Programming Language Principles II**

This course will explore the advanced concepts in various programming paradigms, such as functional, object-oriented, and logic programming. The emphasis of this course will be on ideas and techniques most relevant to practitioners, apart from including foundations crucial for intellectual rigor. Some of the topics covered in this course include abstract syntax, lambda calculus, type systems, dynamic semantics, formal models for specifying languages, design goals, run-time structures, and implementation techniques, along with a survey of principal programming language paradigms. (3 Credit Hours)

### **CSC 958 Optimization for Machine Learning**

Optimization is an important area of machine learning. Optimization allows machine learning methods to flexibly incorporate domain knowledge in applications such as computer vision and natural language processing. The topics covered in this course include deep learning, automatic differentiation, non-convex optimization, probabilistic modeling, stochastic variations, compressibility, probabilistic inference, generative models, adversarial robustness, reinforcement learning, and statistical learning theory. The course focuses mainly on the formulation and solution of convex optimization problems. These general concepts will also be illustrated through applications in statistics, machine learning, artificial intelligence, computer vision, and robotics. (3 Credit Hours)

### **CSC 967 Advanced Topics in Database Systems**

This research-oriented course will explore the key issues of current database theory and practice, identifying current trends in the field of modern database theory and application. Some of the topics covered in this course, include deductive databases, semantic query processing, intelligent and cooperative query languages, distributed databases, multimedia databases, high-velocity transaction processing, stream processing, real time analytics, and high-volume data processing. The discussions will focus on several real-world application domains, including Internet advertising, health care, and social network analysis. (3 Credit Hours)

### **CSC 999 Research Project/Thesis**

This is the supervised research component of the Ph.D. program. It entails the conduct of original and independent doctoral research in Computer Science, culminating in the submission and defense of a Ph.D. thesis that makes a significant contribution to knowledge in the discipline. (12 Credit Hours)

## **Data Science (DSC)**

### **DSC 801 Programming & Data Analytics with Python & R**

Python, as well as R, are excellent options for working with data analytics. This course covers the fundamentals of data analytics and core python/R programming concepts. Students will also use Python/R to apply fundamental data visualization and data analysis concepts using NumPy and Pandas libraries. This course introduces Python and its applications as a data analytics tool, and it assumes no prior Python knowledge. It starts with Python's fundamental concepts: data types, functions, and objects. Students will be exposed to the fundamental tools in Python's data science toolkit: the Pandas package for data wrangling and the matplotlib module for visualization. (3 Credit Hours)

### **DSC 802 Enterprise Database Management**

This course covers relational, key-value, object-relational, distributed database management, document store database architectures and replication and cloud-based instances for scaling out, integrating, and implementing database systems. Advanced database management topics covered include normalization and denormalization, query optimization, distributed databases, data warehousing, and big data. There will be a substantial covering of Structured Query Language (SQL) and database instance tuning and hands-on practice. Students will work on a term project in which they will investigate an advanced database technology of their choice. (3 Credit Hours)

### **DSC 803 Statistics & Time Series Analysis**

This course will cover key topics in statistics and time series analysis. The topics covered in this course will include time series regression and exploratory data analysis, model identification/estimation/linear operators, Fourier analysis, spectral estimation, and state-space models. The analysis will be performed using R. Other topics covered will include descriptive statistics, ANOVA, correlations, spectra, wavelets, etc. This will allow students to perform typical analysis that underlies most modern data science questions. (3 Credit Hours)

### **DSC 804 Data Science & Analytics**

Data Science is a fascinating, lucrative, and fast-growing field. The optimum use of data science in business has encouraged better customer service, inventory management, targeted

advertising, and many other profitable business decisions. Data science uses data to uncover patterns, relationships, and behavior that impact business decisions. Data scientists' structure and analyze large volumes of data, discover patterns, and make predictions. This course includes a considerable portion of mathematics, statistics, coding, domain expertise, machine learning algorithms, and data analysis. Topics to be covered include data collection, integration, management, modelling, analysis, visualization, prediction, informed decision making, and data security and data privacy. The introductory course is integrative across the core disciplines. This course includes several critical topics in data science, including databases, data warehousing, statistics, data mining, data visualization, high-performance computing, cloud computing, and business intelligence. Professional skills, such as communication, presentation, and storytelling with data, will be covered. Students will acquire a working knowledge of data science through hands-on projects and case studies in various business, engineering, social sciences, or life sciences domains. (3 Credit Hours)

### **DSC 805 Machine Learning**

This course aims at educating students on the mathematical and theoretical underpinnings of machine learning. The machine learning principles will be covered first, followed by an examination of various key machine learning ideas and algorithms, such as classification, regression, ranking, dimensionality reduction, deep learning, ensemble methods, and reinforcement learning, among others. Advanced machine learning concepts such as transfer learning, meta-learning, and others will be covered in this course. (3 Credit Hours)

### **DSC 806 Data Visualization**

Visualizing the outcome of data analysis is critical to communicating the results. Presenting and visualizing data and reporting on the analyzed result is a crucial skill when making sense of data. This course will treat standard and cutting-edge visualization techniques to make sense of data and present it in a compelling, narrative-focused story. Students will study the importance of visualization, specific techniques in information. (3 Credit Hours)

### **DSC 807 Data Science Research Methods**

This course will prepare the students on how to construct, analyze, and interpret big data datasets using fundamental data science tools and approaches. This course covers several parts of the data science process, such as data collecting, wrangling, cleaning, exploratory data analysis, visualization, statistical inference, and model construction, as well as their implications for real-world applications. Students will learn how to scrape data from the Internet, create and test hypotheses, reduce dimensionality using principal component analysis (PCA), generate actionable plans, and present their findings. Students will use NumPy, SciPy, PANDAS, and Scikit-learn, as well as their Python programming skills, to employ a variety of core standard Python libraries/toolkits to aid them become data scientists.

### **DSC 810 Business Intelligence**

This course covers the business value of data, planning and business needs, architecture, data design, implementation, business intelligence, deployment, data integration, and new issues in business intelligence. This course focuses on data warehouse (DW) and business intelligence (BI) system architecture and management. Students will be able to comprehend and apply the technology and tools that makeup business intelligence (e.g., data warehousing, data reporting, and OLAP). The design of the technology architecture that underpins BI systems will also be covered in this course. (3 Credit Hours)

### **DSC 814 Cybersecurity Management**

This course will cover the most critical aspects of information security management, focusing on data science and analytics. Network security, database management, and security, risk management, cybersecurity intelligence, security governance and policies, cloud security, and security protocols are among the topics that will be covered in this course. The course will examine security from a managerial and technical standpoint in design, implementation, maintenance, and disaster recovery. (3 Credit Hours)

### **DSC 815 Cloud Computing & Big Data**

The need for computational power and data storage continues to drive the demand for more intelligent systems. Highly data-intensive applications demand fast access to terabytes, petabytes, or even exabytes of storage; processor-intensive applications require access to various types of processors in multiple configurations. Such applications are increasingly being developed in scientific and industrial contexts and need to be variously scalable and supportable for large numbers of geographically distributed users. This module will provide deep insights into how cloud computing attempts to meet the varying needs of such applications. (3 Credit Hours)

### **DSC 818 Case Studies in Data Science**

This course combines all aspects of data science, from gathering data to analysis and visualization, by exploring real-world applications of data science. There will be a discussion of some significant achievements of data science when applied to various areas, from fundamental business practices to physics. Students will then use these skills in a group project. (3 Credit Hours)

### **DSC 888 M.Sc. Thesis**

The dissertation will consist of a substantial written report completed by the student towards the end of their program of studies. This report will be based on significant work that involves applying materials encountered in the taught component of the degree, and extending that knowledge with the student's contribution, under the guidance of a supervisor. The dissertation will last the whole year and usually involves software development, experimental or theoretical research, or a substantial literature survey on a specific topic. (6 Credit Hours)

## **Communication & Information Science (ICT)**

### **ICT 801 System Dynamics**

The increasing complexity of human-activity (socio-technical) systems that surround us today calls for a new approach to problem view and intervention. Systems dynamics represents a new paradigm (holistic rather than linear) to understanding complex problem situations providing a set of graphical modeling tools for discerning the underlying structures of such systems. It adopts a methodology based on computer simulation for building management flight simulators that permit to experiment with various policy choices to find leverage points or changes that affect the desired outcomes or design new policies through restructuring. The course is designed to develop skills in the creation and use of computer simulation models for policy analysis and formulation of business strategy. A principal focus of the course is the significance of information feedback and circular causality in the behavior of sociotechnical systems. (3 Credit Hours)

### **ICT 802 Web Application Development & E-Commerce**

The program is designed to prepare graduates with the knowledge they need to take advantage of electronic commerce opportunities in commercial and enterprise management in the new economy. Students will be able to understand management, public policy, and information technology concepts, and effectively integrate these into developing electronic commerce solutions in a wide variety of specialized applications from electronic government, to electronic banking, to tele-health. More importantly, they will respond to the demand for professionals to work in a wide variety of capacities in digital age organizations in Nigeria and around the world. (3 Credit Hours)

### **ICT 803 Management Information System (MIS)**

This course examines the role of Management Information Systems in supporting organizational planning, decision-making, control, and strategic management. It provides a comprehensive understanding of how information systems are designed, implemented, and managed to improve organizational efficiency and effectiveness in both public and private sector contexts. The course integrates technical, managerial, and organizational perspectives on information systems. Key topics include MIS concepts and components, information systems for operational, tactical, and strategic decision-making, business process integration, enterprise systems, data and knowledge management, and the impact of digital technologies on organizational performance. The course also addresses issues such as systems development, change management, information security, ethical and legal considerations, and the strategic alignment of IT with business objectives. Through case studies and applied analysis, students develop the analytical skills required to evaluate and manage information systems as strategic organizational resources. (3 Credit Hours)

### **ICT 804 Enterprise Database Management**

This course will reveal the fundamentals of database technology and database management systems. It will cover a wide range of topics including uses of databases, database architectures, design, real world implementations, security topics, integrity issues, Structured Query Language (SQL), performance concepts, and storage issues. The emphasis of the course will be on practical applied database technology for enterprise systems. Course will cover logical and physical database design, query languages, and database programming, and will examine commercial systems. The course will also focus on technologies and industry standards for accessing and manipulating persistent data that are suitable for web enterprise application systems. (3 Credit Hours)

### **ICT 808 System Analysis & Design**

This course focuses on the systematic analysis, design, and specification of information systems that support organizational processes and decision-making. It equips students with the conceptual frameworks, methodologies, and tools required to understand user requirements and translate them into effective, efficient, and sustainable system solutions. Emphasis is placed on aligning system design with organizational goals and user needs as well as UML. Key topics include systems development life cycle (SDLC) models, requirements elicitation and analysis, process modeling and data modeling, system specification and documentation, and user interface design. The course also covers object-oriented analysis and design, prototyping, agile and iterative development approaches, and issues related to usability, security, ethics, and change management. Through case studies and practical design exercises, students develop the analytical and design skills needed to plan and develop robust information systems in complex organizational environments. (3 Credit Hours)

### **ICT 809 IT Project Management**

This course provides a comprehensive understanding of the principles, tools, and techniques used to plan, execute, monitor, and successfully deliver information technology projects. It focuses on managing IT projects within constraints of scope, time, cost, quality, and risk, while aligning project outcomes with organizational strategy and stakeholder expectations.

Key topics include project life cycles, project initiation and feasibility analysis, scope and requirements management, scheduling and resource allocation, cost estimation and budgeting, risk and quality management, and project monitoring and control. The course also examines contemporary approaches such as Agile, Scrum, and hybrid project management methodologies, as well as issues of team leadership, communication, procurement, ethics, and project governance. Through case studies and applied exercises, students develop practical skills for managing complex IT projects in dynamic organizational environments. (3 Credit Hours)

### **ICT 812 Emerging Technology (AI Applications to Business)**

This course explores emerging digital technologies with a primary focus on the application of Artificial Intelligence (AI) in contemporary business environments. It examines how AI-driven systems transform organizational decision-making, operations, customer engagement, and competitive strategy across industries. The course blends conceptual foundations with applied perspectives, enabling students to understand both the opportunities and challenges associated with adopting AI in business contexts. Key topics include AI fundamentals and machine learning concepts for managers, data-driven decision-making, business analytics, intelligent automation, recommender systems, natural language processing, and computer vision applications. The course also addresses strategic, ethical, and governance issues such as algorithmic bias, data privacy, explainable AI, and responsible innovation. Through case studies, industry examples, and applied discussions, students develop the capability to evaluate AI solutions, align them with business objectives, and contribute meaningfully to AI-enabled digital transformation initiatives. (3 Credit Hours)

### **ICT 814 Network Architecture & Protocols**

This course provides an advanced and in-depth study of computer network architectures and the protocols that enable reliable, secure, and efficient data communication across modern networks. It examines foundational and emerging networking models, including layered architectures, protocol design principles, and the operation of core Internet protocols. Students explore how networks are structured, how data is transmitted, routed, controlled, and secured, and how architectural choices influence performance, scalability, and resilience.

Key topics include the OSI and TCP/IP models, physical and logical network architectures, switching and routing mechanisms, IP addressing and subnetting, transport-layer protocols, congestion and flow control, and application-layer protocols. The course also covers advanced concepts such as software-defined networking (SDN), network virtualization, wireless and mobile networking, quality of service (QoS), and network security protocols. Through theoretical analysis, case studies, and practical scenarios, students develop the ability to design, evaluate, and troubleshoot complex networked systems in enterprise and Internet-scale environments. (3 Credit Hours)

### **ICT 816 Cybersecurity Fundamentals**

This course introduces the fundamental concepts, principles, and practices of cybersecurity with a focus on protecting information systems, networks, and digital assets against evolving cyber threats. It provides students with a comprehensive understanding of the cybersecurity landscape, including threat actors, attack vectors, vulnerabilities, and risk management

strategies. Emphasis is placed on the confidentiality, integrity, and availability (CIA) of information systems within organizational and national contexts. The course covers core areas such as cybersecurity governance and policy, cryptographic foundations, authentication and access control, secure network and system design, malware and intrusion detection, incident response, and digital forensics basics. Students are also introduced to legal, ethical, and regulatory issues in cybersecurity, including privacy, compliance, and cybercrime. Through case studies, practical examples, and applied discussions, the course equips students with the foundational knowledge required to assess security risks, implement basic security controls, and engage effectively with cybersecurity professionals in both public and private sector environments. (3 Credit Hours)

### **ICT 817 Cloud Computing & Virtualization**

This course provides an in-depth introduction to the principles, architectures, and technologies underpinning cloud computing and virtualization. It examines how computing resources—such as servers, storage, networks, and applications—are abstracted, pooled, and delivered as scalable services over the Internet. The course emphasizes both the theoretical foundations and practical implications of deploying and managing cloud-based systems in modern organizations. Key topics include virtualization concepts and hypervisors, virtual machines and containers, cloud service models (IaaS, PaaS, SaaS), and cloud deployment models (public, private, hybrid, and multi-cloud). The course also explores cloud architecture design, resource provisioning, elasticity, fault tolerance, security and privacy in the cloud, service-level agreements (SLAs), and cost management. Emerging trends such as container orchestration, serverless computing, and cloud-native applications are introduced. Through case studies and applied scenarios, students develop the analytical skills needed to evaluate, design, and manage cloud and virtualized infrastructures for enterprise and large-scale computing environments. (3 Credit Hours)

### **ICT 818 Data Analytics & Visualization**

This course introduces the principles and techniques of data analytics and visualization for extracting insights from structured and unstructured data. It focuses on how data can be collected, processed, analyzed, and visually communicated to support evidence-based decision-making in business, government, and research contexts. The course combines analytical reasoning with practical approaches to interpreting and presenting data effectively. Key topics include data types and sources, data cleaning and preprocessing, exploratory data analysis, descriptive and inferential analytics, basic predictive modeling, and data storytelling. Students learn visualization principles, chart selection, dashboard design, and the use of visual analytics tools to communicate complex patterns and trends clearly. Ethical considerations such as data privacy, bias, and responsible data use are also addressed. Through case studies, hands-on exercises, and applied projects, students develop the skills to analyze data critically and present actionable insights in a clear and compelling visual form. (3 Credit Hours)

### **ICT 855 Organizational Behavior**

In this course, students will study how individuals and groups act within an organization. The course examines the human side of business by combining insights from psychology, sociology, and anthropology to understand workplace dynamics. Students will explore how to improve organizational effectiveness by analyzing behavior at three levels: the individual, the team, and the entire system. (3 Credit Hours)

### **ICT 899 Research Project**

This is a supervised component of the master program. The thesis is a stimulating and challenging part of the master program. It provides the opportunity to apply the knowledge acquired in the taught component of the course and to specialize in one aspect, developing the students' deep understanding and expertise in his/her preferred area of concentration. Students may carry out their project wholly within the University, but industrial based projects are also encouraged. For company sponsored students, projects should be related to the company's present and strategic goals. Industrial projects often lead to recruitment of the student by the collaborating company. At the end of this, student would be able to conduct independent research, which can stimulate their interest to further studies. This is normally done over two semesters. (6 Credit Hours)

### **Information Systems (INF)**

#### **INF 805 Business-IT Alignment Strategy**

This course examines how information technology strategy can be effectively aligned with business strategy to create and sustain organizational value. It focuses on the strategic role of IT as an enabler of competitive advantage, operational excellence, and organizational transformation. Students learn how to evaluate business objectives and translate them into coherent IT strategies that support and shape organizational performance.

Key topics include concepts and models of business–IT alignment, strategic planning processes, IT governance, enterprise architecture, digital transformation, and value realization from IT investments. The course also addresses issues such as strategic fit, organizational capabilities, sourcing strategies, innovation management, and measuring the impact of IT on business outcomes. Through case studies and applied strategic analysis, students develop the skills required to design and assess IT strategies that are tightly integrated with business goals in dynamic and competitive environments. (3 Credit Hours)

#### **INF 806 Cybersecurity**

Cybersecurity course, will enable you embark on a comprehensive journey through the multifaceted domain of cybersecurity, learning to protect and secure information and computer systems from cyber threats and vulnerabilities. This course is designed to equip you with the latest knowledge and skills required to navigate the complex cybersecurity landscape. Upon completion, you will gain a strong foundation in the fundamental concepts of cybersecurity, including cryptography, network security, penetration testing, secure coding, and information security management. The course delves into advanced topics such as intrusion detection systems, secure software development, and the management of cyber risk. You will learn about cutting-edge technologies and methodologies used to defend against sophisticated cyber-attacks and, through hands-on labs and projects, you will apply theoretical knowledge to real-world scenarios. Finally, since the cybersecurity landscape is constantly evolving, this course covers the latest trends and emerging threats, including cloud security, artificial intelligence in cybersecurity, and the security challenges of IoT devices. (3 Credit Hours)

#### **INF 810 Introduction to Enterprise Computing Environments**

This course explores the architecture, implementation, and management of enterprise computing environments with a strong focus on Enterprise Resource Planning (ERP) systems. Students will examine how ERP integrates organizational functions, supports business processes, and enables digital transformation. The course blends theoretical understanding with hands-on experience using leading ERP platforms (e.g., SAP, Oracle, Microsoft Dynamics, or

Odo), emphasizing configuration, data flow, process mapping, and integration with emerging enterprise technologies. (3 Credit Hours)

### **INF 812 Data Mining for Business Intelligence**

The course will provide an introduction to concepts behind data mining, text mining, and web mining. Lectures and real-world examples will be used to explain the fundamental principles, uses, and some technical details of data mining techniques. The emphasis primarily is on understanding the business application of data mining techniques, and secondarily on the variety of techniques. Data mining and investigation is a key goal behind any data warehouse effort. (3 Credit Hours)

### **INF 821 - Artificial Intelligence for Business**

The course is designed to develop versatile leaders who can harness the power of Artificial Intelligence (AI) while effectively managing businesses. This comprehensive program delves into the strategic use of AI, practical applications and various AI tools and prompt engineering. It is tailored for aspiring professionals seeking to leverage the latest advancements in AI for organizational growth and success. You'll delve into the strategic, technical and ethical dimensions of leveraging artificial intelligence and analytics to transform businesses. You'll also focus on formulating strategies that integrate AI capabilities to sustain a competitive advantage. Deepen your AI and programming skillset and learn about common marketing applications, including Chatbots and conversational AI for customer engagement, Dynamic pricing and predictive analytics for sales forecasting, Customer segmentation, Recommendation engines, sentiment analysis and natural language processing. (3 Credit Hours)

### **INF 831 Database Management**

This course examines the design, implementation, and administration of databases within modern organizations. It emphasizes relational database theory, SQL programming, normalization, and data modelling while introducing advanced topics such as transaction management, distributed databases, NoSQL systems, and data governance. Students gain practical experience through hands-on labs using relational database management systems (e.g., MySQL, PostgreSQL, SQL Server) and analytical exercises relevant to enterprise and research contexts. (3 Credit Hours)

### **INF 834 Systems Development & Project Management**

An in-depth study of the concepts and techniques for designing, developing and/or revising software using a planned approach. Both the software development life-cycle model and project management approach are presented. Students apply project management concepts in this course to group and individual projects. (3 Credit Hours)

### **INF 841 – Management Accounting & Accounting Information Systems**

This course integrates management accounting principles with the technical design and operation of accounting information systems (AIS) to support managerial planning, control, and strategic decision-making. It examines how accounting data are captured, processed, stored, and reported through integrated information systems within organizations. Key topics include cost and management accounting techniques, budgeting and performance measurement, management control systems, AIS architecture and components, internal controls, data integrity, and security. The course also explores enterprise resource planning (ERP) systems and accounting-related modules such as general ledger, accounts payable and receivable, inventory, costing, and financial reporting. Attention is given to the impact of

digital technologies and system integration on modern accounting practices. The course equips students with both analytical and systems-oriented skills needed to design, evaluate, and manage accounting information systems in contemporary organizations. (3 Credit Hours)

### **INF 851 Data Science & Business Analytics**

This course provides an advanced understanding of data science concepts and their strategic application in business analytics. Students will learn how data-driven insights can inform managerial decision-making, enhance operational efficiency, and drive digital transformation. Emphasis is placed on integrating statistical, computational, and visualization techniques for business intelligence and predictive analytics using tools such as Python, R, Power BI, and SQL. (3 Credit Hours)

### **INF 855 Organizational Behavior**

Organizational behavior integrates content from several fields including psychology, sociology, economics, organization theory, statistics, and others. This material is then applied to organizations to explain the motivation of people and how the potential of the human side of business is best harnessed. This content is a crucial area of knowledge in information systems security because of the constantly changing security environment and the changing importance of the roles of security officers. Topics such as work motivation, work attitudes, socialization, leadership, decision making, and management of change will all help prepare students for the challenges faced as a security professional or manager.

### **INF 899 Research Project / M.Sc. Thesis**

This is the supervised research component of the M.Sc. program or a substantial literature review on a specific topic. It involves the conduct of an independent research project in Information Systems, culminating in the submission and defense of an M.Sc. thesis that demonstrates the student's ability to apply appropriate theories, methods, and analytical techniques to a defined research problem. (6 Credit Hours)

### **INF 901 Research Directions & Methodology in Information Systems**

This course provides an advanced and comprehensive foundation in research philosophy, methodology, and methods for scholarly inquiry in Information Systems (IS). It is designed to equip doctoral students with the conceptual and methodological competence required to design, conduct, and evaluate high-quality IS research that addresses complex socio-technical phenomena. The course situates IS research within broader debates in the philosophy of science and emphasizes methodological rigor, reflexivity, and coherence between research questions, theoretical framing, and methodological choices. Key topics include the philosophy of science and epistemological traditions relevant to IS research, such as positivism, interpretivism, critical realism, pragmatism, and post-positivist perspectives. The course examines the logic of scientific reasoning, including inductive, deductive, abductive, retroductive, and retrodictive reasoning, and how these logics inform theory building, theory testing, and explanation in IS research. Students engage with quantitative, qualitative, and mixed-methods research designs, covering survey research, experiments, case studies, ethnography, interviews, and archival research. The course further addresses data collection and analysis techniques across methodological traditions, including measurement development, statistical analysis, qualitative coding and thematic analysis, and theory-driven interpretation. Sampling strategies for quantitative and qualitative research—such as probability and non-probability sampling, theoretical sampling, and purposive strategies—are critically examined. Ethical considerations, research quality criteria, and publication expectations in leading IS journals are also discussed. Through seminars, methodological critiques, and proposal-oriented assignments, students

develop the ability to articulate coherent and defensible research designs aligned with contemporary research directions in Information Systems. (3 Credit Hours)

### **INF 902 Advanced Systems Analysis & Design Science**

This course provides an advanced and practice-oriented exploration of systems analysis and design focused on the development of complex IT artifacts. It builds on foundational systems analysis knowledge to equip students with advanced skills in modeling, specifying, and designing robust, scalable, and maintainable information systems. Emphasis is placed on translating complex organizational and technical requirements into well-structured system architectures and design artifacts. The course covers advanced systems development life cycle (SDLC) approaches, including traditional, iterative, and agile models; advanced requirements engineering techniques; business process modeling; and comprehensive system documentation. Students engage deeply with Unified Modeling Language (UML) and object-oriented analysis and design (OOAD), including use case modeling, class and object diagrams, sequence and activity diagrams, architectural modeling, and design patterns. Additional topics include system integration, quality attributes (performance, security, scalability), usability, and managing complexity in large-scale systems. Through intensive modeling exercises, case studies, and artifact-centered projects, students develop the competence to design and specify sophisticated IT systems suitable for enterprise and research-driven environments. (3 Credit Hours)

### **INF 903 Design Science Research Methodology**

This course provides an in-depth examination of Design Science Research (DSR) as a rigorous and practice-relevant research methodology in information systems and related disciplines. It focuses on how knowledge is generated through the purposeful design, development, and evaluation of IT artifacts that address real-world organizational and societal problems. The course equips doctoral students with the theoretical grounding and methodological skills required to conduct high-quality design-oriented research.

Key topics include the philosophical foundations of design science, problem identification and relevance, artifact types (constructs, models, methods, and instantiations), research cycles, and evaluation strategies. Students engage with major DSR frameworks, theorizing from design, design principles, and the articulation of research contributions to both theory and practice. The course also addresses rigor versus relevance, ethical considerations, and publication strategies for design science research. Through critical readings, seminars, and proposal-oriented assignments, students develop the capacity to design, execute, and defend design science studies suitable for doctoral dissertations and top-tier academic outlets. (3 Credit Hours)

### **INF 904 IS Theory Development & Philosophy**

Students develop an understanding about the philosophy of science guiding information systems discipline and its application to research. They should also develop an understanding about developing theory and about its critical role in surfacing a theoretical and practical contribution. Since all theories have an implicit or explicit philosophical assumptions, student should understand how philosophy of science is applied to theory development. They understand how to formulate problems to develop compelling research questions. They learn about the key elements of a theory and the approaches to build a theory. They understand the distinctions between systems, process and variance models and between different types of systems, process and variance models. They learn how to achieve correspondence between logical arguments and the specification of the different elements of a model including constructs, measures, functional forms of relationships, assumptions, and boundary conditions. They develop an understanding about how to leverage context and time in the theory building

process, and about the roles of multi-dimensional constructs and multi-level models in theory development. Cumulatively, they develop the skills and understanding to formulate a problem and specify research questions, synthesize the relevant literatures, build a theory, and specify a model and to achieve correspondence between these essential elements. (3 Credit Hours)

### **INF 906 Advanced Database Management Systems & Web Technologies**

This doctoral course examines the advanced principles, architectures, and research frontiers of database management systems (DBMS) and web technologies as foundations of digital innovation and large-scale information ecosystems. It goes beyond traditional relational models to explore distributed, NoSQL, and cloud-native databases, as well as semantic, graph, and blockchain-integrated data architectures. The course also engages critically with contemporary web technologies, including service-oriented architectures (SOA), RESTful APIs, microservices, and web security frameworks. Students will develop an understanding of how advanced data systems underpin intelligent web applications, digital platforms, and research in data-driven decision-making, analytics, and web engineering. (3 Credit Hours)

### **INF 907 Big Data Analytics & Digital Platforms**

This course examines the theoretical foundations, analytical methods, and technological infrastructures underpinning big-data ecosystems and digital platforms. Emphasis is placed on how large-scale data generation, processing, and analysis drive innovation, value creation, and governance in platform-based economies. Students engage with both the technical logics of data analytics (data pipelines, machine-learning workflows, cloud architectures) and the organizational logics of digital platforms (multi-sided markets, data monetization, algorithmic control). Students will critically analyze research on data-driven decision-making, platform governance, and the societal consequences of algorithmic systems while developing advanced analytical skills relevant to IS research. (3 Credit Hours)

### **INF 910 IT Project Management & Enterprise Resource Planning Systems**

This course provides an advanced understanding of the theories, methodologies, and challenges surrounding Information Technology (IT) project management and Enterprise Resource Planning (ERP) systems implementation. It investigates how organizations plan, execute, and sustain complex IT initiatives that integrate cross-functional processes and data systems. Students will explore project governance, change management, risk mitigation, and ERP lifecycle management through theoretical and empirical research. The course emphasizes strategic alignment, organizational learning, and post-implementation evaluation, while encouraging doctoral-level critique of contemporary methodologies such as agile, hybrid, and DevOps models in enterprise environments. (3 Credit Hours)

### **INF 950 Advanced Qualitative Research Methodology**

This course provides advanced training in qualitative research methodologies for Information Systems and related disciplines. It focuses on the philosophical foundations of qualitative inquiry, qualitative research designs, data collection techniques, and advanced methods of qualitative data analysis for studying complex socio-technical phenomena. Key topics include qualitative research paradigms, case study research, ethnography, grounded theory, interviews, observation, document analysis, qualitative sampling strategies, coding and thematic analysis, theory building, and research rigor, ethics, and reflexivity. The course equips doctoral students with the methodological competence required to design, conduct, and publish high-quality qualitative research.

**INF 962 Cybersecurity & Network Technologies**

This course provides an advanced and integrated study of cybersecurity principles and network technologies, focusing on how secure network infrastructures are designed, deployed, and managed in contemporary digital environments. It examines the interdependence between networking technologies and cybersecurity controls, emphasizing how network architectures, protocols, and services can be protected against modern cyber threats. Key topics include secure network architecture and design, network protocols and services, cryptographic mechanisms, authentication and access control, firewalls and intrusion detection/prevention systems, secure routing and switching, wireless and mobile network security, and cloud and virtualized network environments. The course also addresses threat modeling, vulnerability assessment, incident response, and legal, ethical, and policy issues in cybersecurity. Through case studies, simulations, and applied analysis, students develop the technical and analytical skills required to design, evaluate, and manage secure networked systems in enterprise and large-scale environments.

**INF 999: Information Systems Ph.D. Research Project / Thesis**

This is the supervised research component of the Ph.D. program. It involves the conduct and completion of an original, independent doctoral research project in Information Systems, culminating in the submission and defense of a Ph.D. thesis that contributes new knowledge to the field.

Approved by:

SITC Graduate School Board,  
AUN Graduate School Council 2026