

College of Computing and Informatics

Graduate Certificate Bioinformatics Technology

Student Learning Outcome:

1. Students will possess fundamental computer programming skills.
2. Students will possess knowledge of descriptive and inferential statistics related to bioinformatics problems.

MS Bioinformatics

Student Learning Outcome:

1. Students will possess strong Scientific Communication Skills.
2. Students will identify the goals, approach and outcome of their internship-based project.
3. Students will possess fundamental computer programming skills.
4. Students will possess knowledge of descriptive and inferential statistics related to bioinformatics problems.
5. Students will possess an understanding of fundamental concepts of genomics.

Ph.D. in Bioinformatics and Computational Biology

Student Learning Outcome:

1. Students will be able to demonstrate the following ranges of knowledge: Molecular Sequence Analysis, Structural Bioinformatics, and Bioinformatics Methods
2. Students will be able to demonstrate independent research conclusions and outcomes.
3. Students will be able to demonstrate effective writing skills.
4. Students will be able to demonstrate effective oral communication skills.

BA Computer Science

Student Learning Outcome:

1. Students will be able to create, test, and debug a computer program ensuring the efficiency and correctness of data structures and algorithms, while employing appropriate coding conventions and valid logic.
2. Students will be able to define a problem; recognize context and limitations; research and critically evaluate relevant new and existing tools, technologies, techniques, and designs; and design, create, and test an appropriate solution using the chosen strategy.
3. Students will be able to work effectively in a team, adhering to industry and academic expectations of timeliness, equitable but differentiated team member contributions, and team process documentation.

4. Students will be able to create and deliver an engaging, substantiated, and compelling presentation on computing-related topics to diverse, multicultural target audiences using respectful and inclusive language. Students in the audience will be able to engage in a meaningful manner with the presentation.
5. Students will be able to produce clear, accurate, precise, and situationally appropriate written material in contexts relevant to computing, such as self-documenting code, software documentation, professional communications, team management documents, logical arguments, and research/technical reports.
6. Students will be able to demonstrate ethical awareness, reason about ethical implications from diverse perspectives, give appropriate credit and attribution for others' ideas, and apply ethical principles to decision making in a variety of contexts relevant to computing.
7. **BINF** - Students will demonstrate knowledge of the data and computational tools and procedures used in the field of bioinformatics.
8. **HCI** - Students will demonstrate knowledge of human computer interaction design concepts and related methodologies.
9. **ITAA** - Students will demonstrate the ability to create an IT infrastructure that emphasizes usability, security, and reliability.

BS Computer Science

Student Learning Outcome:

1. Students will be able to create, test, and debug a computer program ensuring the efficiency and correctness of data structures and algorithms while employing appropriate coding conventions and valid logic.
2. Students will be able to define a problem; recognize context and limitations; research and critically evaluate relevant new and existing tools, technologies, techniques, and designs; and design, create, and test an appropriate solution using the chosen strategy.
3. Students will be able to work effectively in a team, adhering to industry and academic expectations of timeliness, equitable but differentiated team member contributions, and team process documentation.
4. Students will be able to create and deliver an engaging, substantiated, and compelling presentation on computing-related topics to diverse, multicultural target audiences using respectful and inclusive language. Students in the audience will be able to engage in a meaningful manner with the presentation.
5. Students will be able to produce clear, accurate, precise, and situationally appropriate written material in contexts relevant to computing, such as self-documenting code, software documentation, professional communications, team management documents, logical arguments, and research/technical reports.
6. Students will be able to demonstrate ethical awareness, reason about ethical implications from diverse perspectives, give appropriate credit and attribution for others' ideas, and apply ethical principles to decision making in a variety of contexts relevant to computing.

7. Students will be able to solve systems problems by utilizing computer system abstractions at multiple levels, creating programs in lower-level languages, and simulating system level mechanisms and policies.
8. AIRG: Students will demonstrate fundamental skills in artificial intelligence, machine learning, and design intentional user experiences.
9. BINF: Students will demonstrate knowledge of the data and computational tools and procedures used in the field of bioinformatics.
10. CYBER: Students will be able to identify the most common attacks to security protocols and procedures associated with software systems.
11. DATA: Students will demonstrate knowledge of data mining, database design, deep analytics.
12. SWSN: Students will possess programming skills in parallel and distributed computing.

Graduate Certificate in Applied Artificial Intelligence

1. Students will design and apply algorithms, data structures, and APIs that are core to interactive computing systems.
2. Upon completing the Game Design certificate, students shall be able to apply game design principles and programming skills to develop a computer game.
3. Upon completing the Game Design certificate, students will have demonstrated the ability to analyze a problem and design, program, and develop a gaming-related software artifact to address a problem.

MS Computer Science

Student Learning Outcome:

1. After completing the Foundations of Computing Core, MSCS students will be able to derive properties of algorithms through a theoretical analysis and design algorithms to have strong theoretical guarantees.
2. Upon completing the AIRG Core, MSCS students will have designed and applied algorithms, data structures, and APIs that are core to interactive computing systems.
3. Upon completing the Data Science Core, MSCS students will demonstrate a graduate-level expertise to extract insight from a large collection of data.
4. Upon completing the Software, Systems, and Networks Core, MSCS students will have leveraged and applied systems level computing, such as parallel computing, networking or computer architecture to solve real-world problems.
5. Upon graduating from the MSCS program, MSCS students will have demonstrated graduate level skills to analyze a problem and design, program, and develop a software artifact to address the problem.

Ph.D. in Computing and Information Systems

Student Learning Outcome:

1. Students will produce a body of research that demonstrates a PhD-level quality, complexity, and quantity of work.
2. Students will use their written communication skills to effectively present research findings.
3. Students will be able to demonstrate effective oral communication skills.

Undergraduate Certificate in Game Design & Development

Student Learning Outcome:

1. Upon completing the Game Design certificate, students shall be able to apply game design principles and programming skills to develop a computer game.
2. Upon completing the Game Design certificate, students will have demonstrated the ability to analyze a problem and design, program, and develop a gaming-related software artifact to address a problem.

Graduate Certificate Data Science & Business Analytics

Student Learning Outcome:

1. Students will demonstrate knowledge of business analytics.
2. Students will demonstrate knowledge of issues relating to modeling, using, and storing data.

MS Data Science & Business Analytics

Student Learning Outcome:

1. Students will demonstrate knowledge of business analytics.
2. Students will demonstrate the ability to develop a project plan to solve a data analytics problem.
3. Students will demonstrate the ability to apply data analytics skills to solve problems.
4. Students will demonstrate effective communication skills that facilitate the effective presentation of analysis results.

Data Science BS Degree

Student Learning Outcome:

1. Students' ability to engage in Effective Communication will be assessed. This assessment will evaluate students' ability to express ideas/arguments in a clear and linear fashion mindful of the content of the communication, its organization and the basic style/mechanics of communication.
2. Students' ability to conduct a data-based, socially relevant capstone project will be assessed. This assessment will evaluate students' ability to: identify a real-world

problem, analyze the evidence/data surrounding the problem (using advanced data structures and algorithms), understand & apply the results of their analysis, and present the findings to an appropriate audience.

MS Health Informatics & Analytics (Online)

Student Learning Outcome:

1. Students will identify the fundamentals of healthcare informatics and analytics to demonstrate an understanding of its application in solving the problems of healthcare organizations.
2. Students will collaboratively apply health informatics and analytics knowledge and techniques to solve relevant healthcare challenges in a team setting.
3. Students will apply healthcare informatics and analytics knowledge and skills in the completion of a real world project that addresses an organization's needs and informs appropriate actions for decision-making.

Graduate Certificate Health Informatics & Analytics (Online)

Student Learning Outcome:

1. Students will identify the fundamentals of healthcare informatics and analytics to demonstrate an understanding of its application in solving the problems of healthcare organizations.

Graduate Certificate in Human-Computer Interactions

Student Learning Outcome:

1. HCI students will demonstrate knowledge of human computer interaction design concepts.
2. HCI students will demonstrate a graduate-level ability to design novel human-computer interactions.

Graduate Certificate in Information Security and Privacy

Student Learning Outcome:

1. ISPR students will demonstrate knowledge of core information security concepts.

Graduate Certificate in Management of Information Technology

Student Learning Outcome:

1. GCIT students will demonstrate a graduate-level ability to design a computer-based system, process, component, or program to meet desired needs.

Graduate Certificate in Software Development

Student Learning Outcome:

1. SD students will demonstrate a graduate-level ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.

MS Cyber Security

Student Learning Outcome:

1. Students will demonstrate core knowledge in security attacks, mechanisms, policy, threats, and systems.
2. Students will demonstrate the ability to build a system that is secure against network-based attacks.
3. Students will demonstrate knowledge of key cryptographic algorithms.
4. Students will demonstrate effective written technical communication in the domain of cybersecurity.

MS Information Technology

Student Learning Outcome:

1. MSIT students will demonstrate a graduate-level ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
2. MSIT students will demonstrate a graduate-level ability to design a computer-based system, process, component, or program to meet desired needs.
3. MSIT students will demonstrate graduate-level knowledge and skills in applying databases to solve practical problems.
4. MSIT Students will demonstrate knowledge of core information security concepts.
5. Students will demonstrate effective written technical communication in the domain of cybersecurity.