LEARNING ANALYTICS AND ARTIFICIAL INTELLIGENCE, MSED

The Learning Analytics Online Master's Degree will empower you to leverage data analytics and artificial intelligence (AI) to drive high-quality decisions within the educational context, and develop adaptive learning systems that leverage analytics and AI to improve student outcomes. The program prepares data scientists to develop advanced skills in measurement, analysis, and predictive modeling, leveraging state-of-the-art methodologies such as machine learning, generative AI, and deep learning, while avoiding algorithmic bias. Students will also develop skills in real-time data analysis and visualization, personalized learning recommendation generation, and data management, equipping them to develop and enhance data-driven educational environments.

This fully online program prepares graduates to work as data scientists and AI practitioners in research and development in areas such as at-risk prediction, and AI-based adaptive learning systems such as intelligent tutoring systems and educational recommender systems. You will emerge understanding when and why to use different methods for a range of applications in order to make a real-world impact. The program teaches you both the latest AI techniques, learning analytics algorithms and tools as well as how to engineer data streams to turn raw data into features that are interpretable to humans and LLMs. Your use of contemporary methods will be grounded in the rich history of educational thought, with an understanding of how this grounding can support efforts to address challenges such as algorithmic bias to improve educational outcomes at scale.

Curriculum

This program requires a total of 10 CUs: eight of these will involve core required courses and the remaining two CUs will involve concentration courses. Coursework in this program focuses on AI components and AI application in educational settings.

The program includes 9 CUs of instruction and 1 CU of a capstone seminar, where students will develop projects with real-world relevance and of a quality that can be submitted as a demo or short papers to international conferences. The Learning Analytics Capstone Seminar course provides the foundation leading to the Capstone project.

Code	Title	Course Units
Required Courses		
EDUC 5144	Dashboards for Discovery and Learning Applications	1
EDUC 6116	Master's Foundations of Teaching and Learning	1
EDUC 6123	Big Data, Education, and Society	1
EDUC 6190	Feature Engineering	1
EDUC 6191	Core Methods in Educational Data Mining	1
EDUC 6195	Capstone Seminar: Learning Analytics	1
Take 2 additional course units (CUs) of EDUC courses at the 5000 level or above. They should focus on LLMs, Deep Learning, and Transformer Models. See advisor for details.		2
Additional Requirements		
EDUC 5183	Adaptive Learning Systems	1
EDUC 6185	Databases and Data Management	1
Other Requirements		
Master's Capstone Project, supported by EDUC 6195		
Total Course Units		**10**

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2025 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.

Learning Analytics and Artificial Intelligence, MSEd and Computer & Information Technology, MCIT (online) Dual Degree

Code	Title	Course Units
Dual Degree Requirements		
Computer and Information Technology Requirements		
CIT 5910	Introduction to Software Development	1
CIT 5920	Mathematical Foundations of Computer Science	1
CIT 5930	Introduction to Computer Systems	1
CIT 5940	Data Structures and Software Design	1
CIT 5950	Computer Systems Programming	1
CIT 5960	Algorithms and Computation	1
Two Electives [1]		2
Learning Analytics and Artificial Intelligence Requirements		
EDUC 6191	Core Methods in Educational Data Mining	1
EDUC 6116	Master's Foundations of Teaching and Learning	1
EDUC 6190	Feature Engineering	1
EDUC 6195	Capstone Seminar: Learning Analytics	1
EDUC 5918	Large Language Model Seminar	1
EDUC 6XXX - Deep Learning and Transformer Models		1
Two EDUC Electives [2]		2
Other Requirements		
Masters Capstone Project, supported by EDUC 6195		
Total Course Units		**16**

[1] Electives cannot be taken from EDUC courses. Students may select other online courses within Engineering.
For MCIT Online students pursuing the dual degree, they may choose to substitute up to 2 of the following courses from the MCIT Online curriculum to satisfy up to 2 CUs toward the Learning Analytics and AI degree:

- CIS 5450: Big Data Analytics
- CIS 5210: Artificial Intelligence
- CIS 5300: Natural Language Processing

[2] Electives are taken from other online EDUC courses offered by the Learning Analytics and Artificial Intelligence program.
For Learning Analytics and AI students pursuing the dual degree, they may choose to substitute up to two of the following courses from the Learning Analytics and AI curriculum to satisfy up to 2 CUs toward the MCIT Online degree:

- EDUC 6123 Big Data, Education, and Society
- EDUC 6185: Databases and Data Management*
- EDUC 5183: Adaptive Learning Systems
- EDUC 5144: Dashboard for Discovery and Learning Applications

*Elective that cannot be taken by dual degree students without them having to take an additional required course.