

ITL-816: Learning Analytics & Educational Data Science			
Credit Hours:	3+0	Prerequisites:	None
Course Objectives:			
<p>This course equips students with advanced knowledge and skills in applying learning analytics and educational data science to improve teaching, learning, and institutional decision-making. It introduces concepts of data collection, integration, and analysis from diverse educational systems, including LMS, CMS, sensor-based tools, and digital platforms. Students will explore predictive modeling, visualization, and data-driven decision support for personalized learning, student retention, and curriculum enhancement. The course emphasizes both the theoretical underpinnings and practical applications of educational data science, enabling students to critically assess the opportunities and challenges of working with large-scale educational data. Through hands-on projects, students will design and evaluate data-informed solutions for real-world educational challenges.</p>			
Course Contents:			
<ul style="list-style-type: none"> • Introduction to Learning Analytics & Educational Data Science • Data Sources in Education (LMS, CMS, MOOCs, IoT/sensor-based systems, ...) • Data Collection, Integration & Preprocessing • Exploratory Data Analysis & Visualization • Predictive Modeling for Student Success • Personalized & Adaptive Learning through Analytics • Social Network & Interaction Analysis • Text & Discourse Analytics in Education • A/B Testing & Experimental Design in Education • Institutional & Administrative Analytics • Ethics, Privacy & Data Governance 			
Course Learning Outcomes:			

At the end of the course, the students will be able to:

1. Understand the fundamental concepts and methods of learning analytics and educational data science.
2. Apply data science techniques to process, visualize, and interpret educational data for practical insights.
3. Analyze ethical, social, and institutional implications of deploying learning analytics in educational settings.
4. Design and implement a semester project applying learning analytics to address a real educational problem.

Reference Materials/ Books:

1. *The Handbook of Learning Analytics*, 2nd Edition, by Charles Lang, George Siemens, Alyssa Friend Wise, Dragan Gašević, Agathe Merceron, 2022
2. *Advancing the Power of Learning Analytics and Big Data in Education*, by Ana Azevedo, José Manuel Azevedo, James Onohuome Uhomoibhi, 2021
3. *Big Data and Learning Analytics in Higher Education: Current Theory and Practice*, by Ben Kei Daniel, Springer, 2017