Sample Syllabus

Course: "Introduction to Learning Analytics"
Professor: Irene-Angelica Chounta
Course Level: Master

Description of the course:

The course provides an overview of the state of the art in learning analytics: that is, the application of data analytics in various educational contexts and learning activities. The course aims to explore the computational methods and tools used in educational research, the impact of data analytics in teaching and learning and to envision future directions for bridging the gap between modern, data-driven practice and pedagogical theory.

This course requires basic programming knowledge and will be supported by digital technologies, such as Moodle, GitHub and Jupyter Notebooks. First, the students are introduced to the definition of learning analytics and what differentiates learning analytics from related concepts, such as educational data mining or learning designs. Then, we will go over the state of the art in learning analytics and how data and analytical methods are commonly used to inform teaching and improve learning in different settings. We will focus on learning analytics that aim to individual learning and learning analytics used for communities/collaborative learning. The students will be introduced to different levels of data and types of analyses: process-oriented analytics, content-oriented analytics, network-oriented analytics. These topics will be discussed during the course but also asynchronously using forum discussions. Next, we will explore and practice over existing course data to answer fundamental questions: for example, predicting student's performance, identifying students at risk or addressing drop-out rates. The students will apply various learning analytics to existing datasets – including their own data - (analytical tasks), compare and communicate their findings to their peers. Finally, we will discuss main principles, problems and future directions for learning analytics in a webinar. During the semester, the students will have to carry out and deliver a project which will be used for assessment along with a written exam.

Learning Outcomes:

After completing the course, the student will:

- have a general knowledge of learning analytics methods, tools and related concepts for modern, learning contexts and paradigms, such as Intelligent Tutoring Systems (ITSs), Massive Open Online Courses (MOOCs), online (e-) learning, mobile learning, blended learning;
- be able to design analytical strategies, carry out pilot studies in different contexts taking into account the specific needs of these contexts and to apply data analytics on educational data to explore research questions and hypotheses with respect to learning goals and outcomes;
- be able to conduct basic data analysis for learning activities using state of the art tools, such as R and Python.

Schedule:

Weeks of studies

September - December 2020

Type	Week and description
e-learning	21/09-27/09/2020 Learning according to the materials in Moodle: video-lectures, written materials, relevant literature and assignments about learning analytics definitions and other related concepts. Asynchronous discussions in forum.
seminar	28/09 - 04/10/2020 2 hours webinar - definitions of learning analytics, introduction to common tools and methods.
e-learning	05/10-11/10/2020 Learning according to the materials in Moodle: video-lectures, written materials, relevant literature, and assignments about the state of the art in learning analytics.

	Asynchronous discussions in forum. Students learn how to build analytical models for learning activities.
e-learning	12/10-18/10/2020 Learning according to the materials in Moodle: video-lectures, written materials, relevant literature, and assignments about the use of data, analytical methods and computational tools in learning analytics. Asynchronous discussions in forum.
seminar	19/10-25/10/2020 2 hours webinar - Introduction to levels of data collected from learning activities and types of analyses.
e-learning	26/10-01/11/2020 Hands-on activity: Practicing with Learning Analytics using Jupyter Notebooks.
e-learning	02/11-8/11/2020 From modeling to practice: Students work individually on choosing and applying learning analytics methods to analyze learning activities.
e-learning	09/11-15/11/2020 Privacy and Data Protection topics in Learning Analytics. Hands-on activity: Practicing with Learning Analytics using Jupyter Notebooks.
seminar	16/11-22/11/2020 2 hours webinar - Applications of Learning Analytics: Teachers and Student Dashboards, Intelligent Tutoring Systems, MOOCs.
e-learning	23/11-29/11/2020 Students evaluate the analytics tasks of the peer students following an anonymized peer-review process.
e-learning	30/11-06/12/2020 Individual work for finalising and submitting analytics tasks.
seminar	07/12-13/12/2020 2 hours webinar - main principles, problems and future directions for learning analytics.
test	13/12-21/12/2020 Examination in the form of an e-test.