LEARNING ANALYTICS TOOLS

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Department of Educational Technology  
IIT Bombay

TYPE OF COURSE  : New | Elective | UG/PG  
COURSE DURATION  : 12 weeks (20 Jul' 20 - 9 Oct' 20)  
EXAM DATE  : 18 Oct 2020

PRE-REQUISITES : None  
INTENDED AUDIENCE : Any Interested Learner

COURSE OUTLINE :  
Learning analytics is a method to collect, measure, analysis and reporting of data about learners and their interactions with a learning environment. Learning analytics is applying analytics on educational data to infer the student learning process and to provide support.

ABOUT INSTRUCTOR :  
Prof. Ramkumar Rajendran is an Assistant Professor in IDP in Educational Technology at Indian Institute of Technology Bombay, Mumbai. He obtained his Ph.D. in Computer Science and Engineering from IITB-Monash Research Academy, IIT Bombay and Postdoctoral training at Vanderbilt University, USA and NEC Central Research Laboratories, Japan.

COURSE PLAN :

**Week 1:** Intro To Data Analytics, What is LA! Definition, Academic Analytics, and Educational Data Mining, Four Levels of Analytics, Descriptive, Diagnostic, Predictive and Prescriptive Analytics

**Week 2:** Data Collection from Different learning environment, Technology Enhanced Learning, Classroom and MOOC environment, Preprocessing, Ethics in Learning Analytics, Student Privacy

**Week 3:** Intro to Machine Learning, Supervised and Unsupervised learning, Regression, Clustering and Classification, Metrics for ML algorithms –Recall, Precision, Accuracy, F-Score and Kappa, Demo of ML algorithms using Orange

**Week 4:** Descriptive Analytics, Data Visualization, Data visualization using Excel, Dashboard Analytics, Dashboard of Youtube, MOOC

**Week 5:** Intro to iSAT, iSAT Demo with example, Diagnostic Analysis, Correlation

**Week 6:** Sequential Pattern Mining, SPM tool Demo, Process Mining, ProM Tool Demo

**Week 7:** Predictive Analytics, Modeling – Feature Selection, Linear Regression, Demo of Linear Regression using Weka

**Week 8:** Decision Tree, Demo of Decision Tree using Orange, Naïve Bayes algorithm, Demo of Naïve Bayes

**Week 9:** Clustering in predictive algorithm, K-Means clustering, Demo of K-Means clustering

**Week 10:** Text analytics, Words, Token, Stem and lemma, Minimum edit distance, Develop algorithm to automatically grade subjective answers, Demo of Word embedding

**Week 11:** Intro Multimodal Learning Analytics, Eye-gaze data collection, Affective computing, Aligning and analyzing data from Multiple sensors

**Week 12:** Advanced topics in LA, How to apply LA in our class, Data repos, Research papers to read, and where to present your work