DEREE COLLEGE SYLLABUS FOR: BAN 4342 Applied Machine Learning

(New course Fall 2025)

UK Level: 6
UK Credits: 15
US Credits: 3/1/3

PREREQUISITES:	CS 1070 Introduction to Information Systems **or** ITC 1070 Information Technology Fundamentals CS 2179 Business Information Systems **or** CS 3051 Business Driven Technology MA 2021 Applied Statistics
CATALOGUE DESCRIPTION:	Machine Learning in the context of AI, Data Mining, Regression, Regularization, Neural Networks: Representation and learning, evaluation of machine learning algorithms, Support Vector Machines, Unsupervised Learning, Anomaly Detection.
RATIONALE:	The main goal of this course is the application of machine learning techniques to extract information from real-world data sets. It aims to provide students with the necessary skills to prepare a data set for machine learning, use machine learning algorithms to infer patterns from data, and evaluate the results of machine learning.
LEARNING OUTCOMES:	As a result of taking this course, the student should be able to: 1. Synthesize appropriate machine learning techniques to discover knowledge that is needed for the solution of a specific business problem by formulating a business problem as a data mining task. 2. Evaluate the quality of the inferred knowledge patterns. 3. Apply machine learning solutions to real-life business problems using appropriate software tools.
METHOD OF TEACHING AND LEARNING:	In congruence with the learning and teaching strategy of the College, the following tools/activities are used: ➢ Lectures, class discussions on case studies, flipped classroom, simulation and best teaching and learning practices. ➢ Laboratory hands-on sessions on business process design, business process mining and business process automation tools. ➢ Office hours held by the instructor to provide further assistance to students. ➢ Use of the Blackboard Learning platform to further support communication, by posting lecture notes, assignment instruction, timely announcements, and online submission of assignments.
ASSESSMENT:	**Summative:**

First Assessment - Midterm Examination	**30%**
Final Assessment - Research Project (evaluation of a machine learning model applied in a business context)	**70%**

	Formative: Coursework: case problems — **0%** The formative assessment aim to shape teaching along the semester and prepare students for the summative assessments. The Midterm Examination tests Learning Outcome 1. The Research Project tests Learning Outcomes 1, 2 and 3. (Guidelines and assessment rubrics are distributed on the first day of classes along with the course outline)
READING LIST:	REQUIRED READING: • Tan P.N., Steinbach M., and Kumar V. Introduction to Data Mining, Pearson. RECOMMENDED READING: • Zaki M. J., and Meira W. (2014), Data Mining and Analysis, Cambridge University Press. • Hand D., Mannila H., Smyth P. (2001), Principles of Data Mining, MIT Press. • Bishop C.M. (2007), Pattern Recognition and Machine Learning, Springer. • Mitchel T.M. (1997), Machine Learning, McGraw Hill.
COMMUNICATION REQUIREMENTS:	Daily access to the course's site on the College's Blackboard CMS. Effective presentation skills using proper written and oral English.
SOFTWARE REQUIREMENTS:	SAS Enterprise Guide, SAS Visual Analytics, SAS Enterprise Miner, SAS Forecast Studio.
WWW RESOURCES:	http://www.dataminingapps.com/ https://www.sas.com/en_us/learn/academic-programs/resources/free-sas-e-learning.html http://support.sas.com/documentation/onlinedoc/guide/index.html http://support.sas.com/documentation/onlinedoc/va/index.html http://support.sas.com/documentation/onlinedoc/miner/index.html
INDICATIVE CONTENT:	1. Introduction to data mining 2. Linear Regression: single and multiple variables 3. Logistic Regression 4. Regularization 5. Neural Networks: Representation & Learning 6. Evaluating machine learning algorithms 7. Support Vector Machines

	8. Unsupervised Learning 9. Anomaly Detection 10. Advanced topics in Machine Learning