REM master basic syllabus

Title:
NE6015 Data Analytics for Engineering

Credit value:
5 ECTS

Mandatory/Optional:
Optional

Semester:
1

Lecturer/s:
Dominic O' Sullivan, Marguerite Nyhan, Ken Bruton

University:
University College Cork

Department:
School of Engineering

Rationale:
This module focuses on teaching the practical programming skills required for analysis of engineering data sets.

Objectives:
On successful completion of this module, students should be able to:

- *Analyse data in Engineering contexts.*
- *Manipulate and transform data.*
- *Produce visualisations of data.*
- *Formulate data models.*
- *Deploy data models.*
- *Evaluate machine learning algorithms*

Skills: *(according to the list of skills provided)*

Subject skills	REM Master Skills						
	L2.1	**L2.2**	**L2.3**	**L2.4**	**L2.5**	**L2.6**	**L2.7**
L3.1. Modelling of engineering scenarios to understand context, data flows/sources etc. Data integration.	X	X			X	X	X
L3.2. Data processing and cleaning of integrated data	X		X				
L3.3. Data exploration, visualisation and comprehension of dataset (e.g. data distribution, summary statistics etc.).	X	X					
L3.4 Building, testing and deploying predictive models	X		X		X	X	

Teaching and learning methods:

The teaching method is based on a series of lectures where the lecturer explains the main concepts through power point presentations and worked out examples on the board. The students are also presented with a variety of issues of practical nature during the lectures. The design assignment is will be supported in the lab and it is this assignment by which students are fully assessed.

Allocation of student time:

	Attendance (classroom, lab,…)	**Non attendance (lecture preparation, self study…)**
Lectures	24 hours	12 hours
Tutorials	0 hours	0 hours
Assignment	12 hours	24 hours
Private study		

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Assessment:

Site visit report, design report and final written exam test students' achievements of the learning outcomes.

Assessment Matrix:

Subject skills	**Assessment method**					
	Exam	**Class test**	**Coursework**	**Report**	**…**	**…**
All		-	100%			

Programme:

Lesson 1	***Introduction and Data Integration*** *Distribution (2 h theory)*
Lesson 2	***Probability and Statistics*** *Distribution (2 h theory)*
Lesson 3	***Data processing and cleaning.*** *Distribution (2 h theory)*
Lesson 4	***Data exploration and visualisation.*** *Distribution (2 h theory)*
Lesson 5	***Programming Fundamentals*** *Distribution (2 h theory)*
Lesson 6	***Data Visualisation***

	Distribution (2 h theory)
Lesson 7	***Database Management*** *Distribution (2 h theory)*
Lesson 8	***Model Development*** *Distribution (2 h theory)*
Lesson 9	***Model Deployment*** *Distribution (2 h theory)*
Lesson 10	***Model Testing*** *Distribution (2 h theory)*
Lesson 11	***Engineering Case Study*** *Distribution (2 h theory)*
Lesson 12	***Engineering Case Study*** *Distribution (2 h theory)*

Resources:

A classroom, equipped with a blackboard and audio-visual resources (laptop/computer and Internet connection + projector), for the lectures.
For assignment: access to computer lab

Bibliography:

Further comments: