Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
INF383	Fundamentals of Data Science	5	3	0	0	3	5

Prerequisites	
Admission Requirements	

Language of Instruction	French
Course Type	Elective
Course Level	Bachelor Degree
Objective	This course aims at giving a general perspective and the ability of creating applications about data mining which is an important task of advanced computer science to the students. The real-world problems related to association rule mining, clustering and classification will be analyzed and possible solutions to those problems will be examined. Hence, the students will be able to propose practical solution to the data analysis problems.
Content	Fundamentals of Data Mining Data Preprocessing 1 - Cleaning, normalization, binning Data Preprocessing 2 - standardization, discretization, reduction Association Rule Mining 1 - Apriori Algorithms Association Rule Mining 2 - FP-Growth Algorithm, other algorithms Classification 1- Fundamentals, Decision Tree Classification 2- Bayesian Classification Classification 3- Neural Networks Midterm Clustering 1 - Fundamentals, Distance, Partitioning Algorithms Clustering 2 -Hierarchical Algorithms Clustering 3 - Grille and Density based Algorithms Advanced Topics in Data Mining 1 - Sequential Pattern Mining Advanced Topics in Data Mining 2 - Text mining
References	1. PDQ Statistics, Geoffrey R. Norman, David L. Streiner, 2003 2. The Art of R Programming, A tour of Statistical Software Design, Norman Matloff, 2011 3. Data Mining Concepts and Techniques, Jiawei Han, Micheline Kamber, 2006 4. Introduction to Data Mining , Pang-Ning Tan, Michael Steinbach, Vipin Kumar 2006 5. Software for Data Analysis: Programming with R (Statistics and Computing), John M. Chambers, 2008 6. Data Mining with R: Learning with Case Studies (Chapman & Hall/CRC Data Mining and Knowledge Discovery Series), Luis Torgo, 2011

Theory Topics

Week	Weekly Contents
1	Fundamentals of Data Mining
2	Data Preprocessing 1 - Cleaning, normalization, binning
3	Data Preprocessing 2 - standardization, discretization, reduction
4	Association Rule Mining 1 - Apriori Algorithms
5	Association Rule Mining 2 - FP-Growth Algorithm, other algorithms
6	Classification 1- Fundamentals, Decision Tree
7	Classification 2- Bayesian Classification
8	Classification 3- Neural Networks
9	Midterm
10	Clustering 1 - Fundamentals, Distance, Partitioning Algorithms
11	Clustering 2 -Hierarchical Algorithms
12	Clustering 3 - Grille and Density based Algorithms
13	Advanced Topics in Data Mining 1 - Sequential Pattern Mining, Project Presentations 1

Week	Weekly Contents
14	Advanced Topics in Data Mining 2 - Text mining, Project Presentations 2