[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

This course is designed to introduce the basic concepts of data mining techniques and methods. It provides students to understand the general knowledge of these techniques and how to apply an awareness of existing data mining methods. Data mining process is mainly focused on finding important information or knowledge from real-world data sources, e.g., databases, texts, images and the Web, etc. Knowledge on data analysis is useful in massive data for helping people to have a better insight on it. By studying this course, students are equipped with extensive knowledge of data mining as well as the meaning, applications and its consideration towards their impact on computer science industry. Moreover, students understand and apply popular algorithms of data mining to solve problems in the real enterprise. The course also provides the important algorithms in data mining: classification, clustering, association rules, regression, and provides using of those methods to support the

2. Course Goals and Objectives (Approximately 100 words)

The objective of this course aims to equip students with comprehensive knowledge of data mining techniques and methods. After completing this course, the student has ability to
- understand the basic knowledge of data mining techniques and method
- analysis the issues of data pre-processing step for a large amount of data
- have skills to demonstrate knowledge of basic algorithms, in particular the application of supervised and unsupervised algorithms
- apply popular algorithms of data mining to find important information or knowledge from real-world data sources

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

Textbook:
[1] "Introduction to Data Mining," Pang-ning Tan, Michael Steinbach, Vipin Kumar, 1st Edition, 2005.
[2] "Data Mining Methods and Models," Daniel T. Larose, 2006.

4. Reference

Additional Reference:
[1] "Data Mining, Concepts and Techniques," J. Han and M. Kamber, 3rd Edition, 2011.
[2] "Introduction to Machine Learning with Python," Andreass C. Muller & Sarah Guido, 1st Edition, 2016.

5. Course Requirements and Grades

Course Requirements:
Assessment Method: Lecture, Final Exam, Assignment
Resource: Python programming with Jupyter Notebook
Grades: Final Exam (80%), Attendance (10%), Assignment (10%)
Credit Value: 3

6. Course Calendar

Week	Main Content
1	Introduction to Data Mining and Methods
2	Type of Data and Data Preprocessing
3	Supervised Learning: Classification with Nearest-Neighbor Classifier
4	Supervised Learning: Classification with Naive Bayes Classifier
5	Supervised Learning: Classification with Decision Tree
6	Supervised Learning: Classification with Artificial Neural Network (ANN)
7	Supervised Learning: Classification with Support Vector Machine (SVM)
8	Supervised Learning: Simple Regression
9	Unsupervised Learning: Association Analysis with Apriori Algorithm
10	Unsupervised Learning: Association Analysis with FP-Growth Algorithm
11	Unsupervised Learning: Cluster Analysis with K-means
12	Dimensionality Reduction: Principal Component Analysis (PCA)
13	Model Evaluation and Improvement
14	Practical: Working with Text Data