INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FACULTY OF SCIENCE AND DATA ANALYTICS
DEPARTMENT OF STATISTICS
STATISTICS UNDERGRADUATE PROGRAM

Course	Course Name	:	**Data Mining and Visualisation**
	Course Code	:	SS234522
	Credit	:	3 SKS
	Semester	:	V

COURSE DESCRIPTION

Data Mining is one subject in the field of theory, which aims to master the basic concepts of mathematics to understand the theory of vectors, basic operations of DATA MINING, determinants, inverses, random vectors, systems of linear equations, vector spaces, values and eigenvectors. Besides that, students able to use this concept for processing random variables, formulating modeling and calculating univariate and multivariate calculations. To achieve this goal, the learning strategy used is discussion and practice both manually and with a computer program package

PROGRAM LEARNING OUTCOME

PLO-2	Able to study and utilize science and technology in order to apply it to certain areas of expertise, and be able to make appropriate decisions from the results of their own work or group work in the form of final project reports or other forms of learning activities whose output is equivalent to the Final Project through logical, critical thinking , systematic and innovative.
PLO-3	Able to manage self-learning and develop oneself as a personal lifelong learner to compete at national and international levels, to make a real contribution to solving problems by implementing information and communication technology and paying attention to the principles of sustainability and understanding technology-based entrepreneurship.
PLO-6	Able to design, collect, and perform data management with the right methodology
PLO-7	Able to use modern computing devices to solve statistical problems
PLO-8	Able to use computing techniques to solve statistical problems
PLO-9	Able to apply statistical methods to analyze theoretical and real problems
PLO-10	Able to apply business, industrial, economic, social, health or environmental statistical methods to real problems

COURSE LEARNING OUTCOME

CLO.1	Can explain the concept of data mining and its application in various fields
CLO.3	Able to explain data mining procedures starting from pre-processing to presenting information
CLO.4	Able to identify, formulate, and solve statistical problems using techniques in Data Mining
CLO-5	Able to use computational techniques and modern computer equipment required in

	Data Mining
CLO-6	Has knowledge of current and upcoming issues related to the Data Mining field
CLO-7	Able to communicate effectively and work together in interdisciplinary and multidisciplinary teams
CLO-8	Has professional responsibilities and ethics
CLO-9	Able to motivate yourself to think creatively and learn lifelong

MAIN SUBJECT

1. Concepts of data mining and their applications
2. Data integration, transformation, data reduction and data discretization
3. The importance of preprocessing data, data cleaning procedures which include missing values and noisy data
4. Mining Associations rule and Recommender System procedures
5. Unsupervised learning concepts and apply them to data
6. Decision Tree concept and apply it to data
7. Naïve Bayes concepts and apply them to data
8. SVM concepts and apply them to data
9. SVR concept and apply it to data
10. Evaluation measures on classification and regression problems

PREREQUISITE

Applied Multivariate Analysis

REFERENCES

1. Witten, I.H., Data Mining: Practical Machine Learning Tools and Techniques, Second Edition, Elsevier, 2005.
2. Han,J., Kamber, M. and J. Pei, Data Mining: Concepts and Techniques. Morgan Kaufmann, 3rded. , 2011
3. Hastie, T., Tibshirani, R., Friedman, J., The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition, Springer, 2009.
4. Tan, P.-N. , Steinbach, M. and Kumar, V., Introduction to Data Mining, Wiley, 2005
5. Nisbet, R. and Elder, J., Handbook of Statistical Analysis and Data Mining, Elsevier, 2009.
6. Duda, R. O., Hart, P. E., and Stork, D. G., Pattern Classification, 2ed., Wiley, Interscience, 2000
7. Larose, D.T., Data Mining Methods And Models, John Wiley & Sons, Inc., , 2006
8. James, G., Witten, D., Hastie, T., Tibshirani, R., An Introduction to Statistical Learning with Application in R, Springer Inc. , 2013