Module code | SS-4315
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Module Title | Machine Learning
Degree/Diploma | Bachelor of Science (Computer Science)
Type of Module | Major Option
Modular Credits | 4
Total student Workload | 10 hours/week
Contact hours | 4 hours/week
Prerequisite | SS-2202 Algorithms and Data Structures
| SS-2207 Introduction to Artificial Intelligence and Soft Computing
Anti-requisite | None

Aims
This module covers the principles, approaches and techniques of machine learning, encompassing three main types of learning; supervised, unsupervised and semi-supervised. This module is a compulsory module for Soft Computing stream.

Learning Outcomes
On successful completion of this module, a student will be expected to be able to:

Lower order: 20%
- understand and differentiate between the different types of machine learning approaches
- explain the principles and motivations behind the different learning approaches
- understand the different machine learning algorithms
- understand the limitations of the different machine learning algorithms

Middle order: 60%
- know suitable performance measures to evaluate machine learning algorithms
- implement machine learning algorithms using existing codes

Higher order: 20%
- know which machine learning techniques to use for specific problems
- apply machine learning techniques on common problems

Module Contents
- Introduction to machine learning and its applications;
- Supervised learning; regression and classification; support vector machines; decision trees
- Unsupervised learning; cluster analysis and validity; k-means, hierarchical clustering, fuzzy c-means
- Model-based clustering; kernel methods; principal component analysis; machine learning programming

Assessment
Formative assessment | Interactive Quizzes and Feedback
Summative assessment | Examination: 50%
| Coursework: 50%
- 2 class tests (20%)
- 1 written assignment (15%)
- 1 laboratory exercise (15%)