

# NMK40403: Artificial Intelligence

## [lecture 0]

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### Synopsis

This subject focuses on the concept of Artificial Intelligence(AI) field in terms of definition, history and characteristics including some example of applications in this specific field. This subject convey understanding and skill in several AI techniques. This subject is an interesting subject and an additional skill for students to design and develop coding using advanced techniques for sophisticated systems.

### Reference:

- 1-Alexandre Kowalczyk, Support Vector Machines Succinctly, USA, Syncfusion, 2017
- 2-Russell, S.J. & Norvig P., 'Artificial Intelligence: A Modern Approach (3rd Edition)', Pearson Education Limited, 2016.
- 3-Negnevitsky, M., 'Artificial Intelligence: A Guide to Intelligent Systems'. England: Addison Wesley, 2011.
- 4-Warwick, K., 'Artificial Intelligence: The Basics'. Oxon:Routledge, 2012.
- 5-Ertel, W., 'Introduction to Artificial Intelligence'. London : Springer-Verlag, 2011.

### Course Objectives and outcomes

- CO1: Ability to COMPARE concepts and characteristics of Artificial Intelligence systems
- CO2:Ability to DIFFERENTIATE between Artificial Intelligence systems and conventional systems
- CO3: Ability to DESIGN appropriate techniques to represent knowledge and DEVELOP solution for the given problems using appropriate AI techniques

### Topics

- Introduction
- Support-Vector Machines (SVM)
  - The perception
  - The SVM optimization Problem
  - Solving SVM Optimization Problem
  - Soft Margin SVM
  - Kernels
  - SMO Algorithm
  - Multi-class SVM

- Rule-based Expert systems
- Fuzzy Expert systems
- Artificial Neural Networks
- Evolutionary Computation

## Labs

- Vector, Linear Separability, Hyperplanes and Perceptron
- The SVM Optimization Problem
- Solving the Optimization Problem
- Soft Margin SVM
- Kernels
- The SMO Algorithm
- Multi-class SVM

## Assessments

Course Outcomes (CO)		Level of Complexity	Programme Outcomes	Assessment Components & Contribution							
				Components	Group (G) Individual (I)	Engineering Problems (WP, SP, DP)	Engineering Activities (EA, TA, NA)	Final Examination (FE)	Continuous Assessment (CA)	Total	
								%	%	%	
CO1	Ability to COMPARE concepts and characteristics of Artificial Intelligence systems	C4	P03	FE Q1	I			10		40	
			P03	FE Q2	I			10			
			P03	Quiz	I				10		
			P03	Test Q1	I				10		
CO2	Ability to DIFFERENTIATE between Artificial Intelligence systems and conventional systems	C4	P03	FE Q3	I			10		30	
			P03	FE Q4	I			10			
			P03	Test Q2	I				10		
CO3	Ability to DESIGN appropriate techniques to represent knowledge and DEVELOP solution for the given problems using appropriate AI techniques	P4	P05	Laboratory Work	I				15	30	
		A6	P08	Project	G				15		
Total				Individual (I) %	85			40	60	100	
				Group (G) %	15						

## Time table

Monday	Lab	10:00 to 13:00 PM MKM1
Monday	Lecture	14:00 to 16:00 PM BKN 4&5

## **What is AI**

Artificial Intelligence (AI) is a field that has a long history but is still constantly and actively growing and changing. In this course, you'll learn the basics of modern AI as well as some of the representative applications of AI. Along the way, we also hope to excite you about the numerous applications and huge possibilities in the field of AI, which continues to expand human capability beyond our imagination.