University: **Alexandria**
Faculty: **Science**
Program: **Computer Science**

Form no. (12)
Course Specification

1- Course Data

Course Code:	**Course Title:**	**Academic Year/Level:**
CS 324	**Machine Learning**	Third level (First semester)
Specialization: Computer Science	**No. of Instructional Units:** **Lecture** 2 **Lab** 3	

2- Course Aim	• This course is designed to encourage in students a sense of interest for machine learning concept and its application in different contexts • Provide a solid foundation in the major areas of machine learning • Provide education and training of high quality in machine learning
3- Intended Learning Outcome	
a- Knowledge and Understanding	a1. Describe the main concepts, definitions of intelligence systems a2. Review theories and concepts used in machine learning a3. Identify an understanding of the contribution and impacts of machine learning in scientific, social, economic, environmental, political and cultural terms. a4. Parallel intelligence systems and cellular automata a5. Neural systems and recurrent, Hopfield and self-organization learning a6. Decision tree classification system

b- Intellectual Skills	b1. Manipulate and apply appropriate theories, principles and concepts relevant to machine learning b2. Critically assess and evaluate the literature within the field of machine learning b3 Deduce and interpret information from a variety of sources relevant machine learning
c- Professional Skills	**c1.** Plan, design and execute practical activities using techniques and procedures Appropriate to machine learning **c2.** Execute a piece of independent research using machine learning**,** computer media and techniques;.
d- General Skills	**d1.** Develop appropriate effective written and oral communication skills relevant to the specific course of machine learning **d2.** Demonstrate the ability to work effectively as part of a group **d3.** Solve problems relevant to machine learning using ideas and techniques some of which are at the forefront of the discipline. **d4.** Solve problems relevant to **applications in real life** in computer science using old and new languages some of which are at the forefront of the discipline;
4- Course Content	• Introduction to artificial intelligence (AI). • Algorithmic vs non algorithmic approach • AI applications and techniques. Problem space and search strategies. • problem and state space, production system, basic control strategies, forw and backwards reasoning, heuristic search. Knowledge representation usi predicate logic, rule based production system. • Perception and learning - techniques, constrained satisfaction, Waltz algo neural nets, role learning, learning as classification, learning as problem s task. • Planning, reasoning under uncertainty. Evolutionary computation. Agents and multiagent systems.

5- Teaching and Learning Methods	Lecturers – Home works - Oral discussion - Quizzes
6- Teaching and Learning Methods for Students with Special Needs	NONE
7- Student Assessment:	
a- Procedures used:	Lecturers – tutorials- homework – oral discussion - Quizzes
b- Schedule:	Mid-Term exam… …. Week 10 Final exam ……. Week 17
c- Weighing of Assessment:	Term work (exam + home works) 20% Lab exam 10% Oral exam 10% Final exam 60%
8- List of References:	Artificial Intelligence: A modern approach, by Stuart J. Russell, Peter Norvig
a- Course Notes	Course notes provided by the Faculty member of Computer Science Division, Math department, to be handled at the beginning of the semester.

b- Required Books (Textbooks)	Artificial Intelligence: A modern approach, by Stuart J. Russell, Peter Norvig
c- Recommended Books	Artificial Intelligence: A modern approach, by Stuart J. Russell, Peter Norvig
d- Periodicals, Web Sites, ..., etc.	

Course Instructor: Dr. Yasser Fouad
Head of Department: Prof. Dr. Wagdy Gomaa.
Date: 1/10/2014