Practical Workbook
CS-412
Artificial Intelligence

Name   : _____

Year   : _____

Batch   : _____

Roll No   : _____

Department: _____

Department of Computer & Information Systems Engineering
NED University of Engineering & Technology,

Practical Workbook
CS-412
Artificial Intelligence

Prepared by:

Dr. Saad Qasim Khan

Revised in:

September 2019

**Department of Computer & Information Systems Engineering
NED University of Engineering & Technology**

INTRODUCTION

The Laboratory Workbook supports the Practical Sessions of the course Artificial Intelligence (CS-412). The Workbook has been designed to cover the major areas of Artificial Intelligence including Expert Systems, Machine Learning, Computer Vision and Fuzzy Logic Systems.

The Course Profile of CS-412 Artificial Intelligence lays down the following Course Learning Outcome:

"Practice system programming using a contemporary operating system (C3, PLO-3)"

All lab sessions of this workbook have been designed to assist the achievement of the above CLO. A rubric to evaluate student performance has been provided at the end of the workbook.

First part of this workbook is related to Machine Learning algorithms using Artificial Neural Networks (ANN), which is a problem solving paradigm, used to solve complex, non-linear problems where conventional algorithm solution is either not possible or not feasible. The section begins with laboratory session on implementation of basic logic function, and is followed by methods of creating and working on ANNs. Next lab session describes problems solving phases of ANNs; and finally the effect of external have been observed on the performance of ANNs.

The second part covers the basic and advanced concepts of developing Expert Systems. The two laboratory sessions discuss the syntax and usage of Specialization/Generalization definitions of Rules and Data Driven Programming. These two laboratory sessions covers the details of knowledge extraction and structures of a typical Expert System.

The third part explains how to build Fuzzy Logic based applications using Matlab Fuzzy Logic Toolbox. It also covers another tool Fuzzy Tech for building these applications

The Fourth section comprises on four laboratory sessions. The objective of the first laboratory session is to introduce the Machine learning tools (Matlab toolbox, Weka and PRAAT) for implementing various learning machines based applications. The remaining three laboratory sessions describe the principle and working methodology of the machine learning tools including exercise problems.

CONTENTS