



## Documentation for the Machine Learning Diploma

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### Introduction

Bit404 is a leading company in software development in Jordan, Bit404 Leaders ( Dr. Abdulkareem Alhariri and Mr. Beshar Shraidah) with their complete vision about the near future of Artificial Intelligence in Jordan, decided to enhance the knowledge of Jordanian Youth with this revolutionary science.

Omar Alnasier (the instructor of this course) is a data scientist, senior developer, and team leader at Bit404, programming languages trainer at Bit404 training section, has got his master's degree in computer engineering from the GJU, also he is working as a research assistant in the machine learning field with the chair of communication engineering department at GJU (Dr. Mustafa Shawaqfeh).

This course moves you from the basics of machine learning to the advanced levels, it is designed to give you the experience to handle real life problems, basically it starts from the concepts, problems that you may face, theoretical solutions, then implementing the solutions using Python(Coding will be 75 % of the time of any lecture).

As mentioned before, this course will move you from the basics to the advanced levels, so if you want to master the field of machine learning, then this course is for you, but if you don't have time to focus on this course( it needs 2 hours/day except the 9 hours/week), then you should not attend this course.

Finally, there are some requirements that you should know about before attending this course, see the next section to learn about it.

## Requirements:

- You are a student in one of the following majors (computer engineering, communication engineering, electronic engineering, electrical engineering, biomedical engineering, mechatronics engineering, computer science, software engineering, management information systems, accounting information systems, network and security engineering, pharmacy, doctors of pharmacy, doctors of medicine, genetic engineering, biology, medical researchers ) .
- You can spend 2 hours daily (except the 9 hours weekly).
- You have a strong motivation to start off the field of machine learning.
- You have a laptop.

## Course Topics

- ❖ Introduction to machine learning, categories of ML systems, categories of the problems that ML can solve, real world applications, challenges of ML systems, the basics of Python, and linear algebra using Python(5+ code samples, 1 task)
- ❖ Defining the problem, assumptions and expectations, loading datasets from different sources: excel files, csv files, sql, dividing data into training sets and test sets ( 6+ code samples, 1 task).
- ❖ Looking deeply into data, doing statistical analysis and data wrangling (10 code samples, 1 task).
- ❖ Handling and pre-processing different types of data, categorical data, numerical data, text, images, and videos(30+ code samples, 1 task).
- ❖ **The first project( Mini project).**
- ❖ Dimensionality reduction(15+ code samples, 2 tasks)
- ❖ **The second project( Mini project).**
- ❖ Different Metrics for evaluating models(10+ code samples, 1 task).
- ❖ Gradient decent( 2+ code samples, 1 task)
- ❖ Linear regression, polynomial regression, lasso regression, and ridge regression(3+ code samples, 1 task)
- ❖ Logistic regression(3+ code samples, 1 task).
- ❖ K-nearest neighbors(3+ code samples, 1 task).
- ❖ Trees and forests(7+ code samples, 1 task)
- ❖ **The third project( Mini project).**
- ❖ Linear and nonlinear Support vector machines(3+ code samples, 1 task).
- ❖ **The fourth project( Advanced project).**
- ❖ Naïve Bayes(3+ code samples, 1 task).
- ❖ Optimal model selection(3+ code samples, 1 task)
- ❖ Unsupervised learning, clustering and gaussian mixture(4+ code samples, 1 task).
- ❖ **The fifth project(Advanced project).**

Remark: This course is hands-on-experience course, it's all about practicing machine learning field by your hands, and you will learn the best practice from professional data scientist.

**By Bit404 Team**