Syllabus for PBL Program

1. Course Details

Title	**Machine Learning and Data Science II – Development and Frameworks**
Targeted Students	**Undergraduate students with an interest in computer science, machine learning, data science, and their applications. The course offers an exploration of selected techniques for machine learning and data science with a special focus on the implementation in common programming frameworks.**

2. Program Introduction and Objectives

Introduction		**The course will cover a range of topics in machine learning and data science. We will discuss selected topics that are commonly used for a wide range of applications. A special focus will be on common development frameworks, and how they can be used to implement data science and machine learning techniques.**	
Objectives	**Theoretical**	supervised/unsupervised/reinforcement learning, Frameworks: TensorFlow, Scikit-learn, PyTorch, Pandas, Matplotlib	
	Practical	**Software/Skills**	Python programming tasks
		Details	The students will develop basic machine learning applications in Python
Teaching Method		During lectures, the professor outlines the basic framework of each topic. These are supplemented by workshop and case analysis as indicated in the schedule. The lectures will cover the basic theoretical basis of each technique and how this is implemented various common Python frameworks.	

3. Program Schedule

Week		**Lecture Topic**	**Workshop and Case Study**	**Assignment**
1	**Topic**	**Most common Machine Learning Techniques**	**Discuss recent applications of machine learning and data science in industry and science**	**Pick a specific machine learning application and prepare an in-depth presentation of it**
2	**Topic**	**Scikit-Learn Overview and Examples**	**Understand the basics of the Scikit-Learn framework implement example**	**Develop a Scikit-Learn Application**
3	**Topic**	**Tensorflow**	**Understand the basics of**	**Develop a**

		Overview and Examples	**the TensorFlow framework implement example**	**TensorFlow Application**
4	**Topic**	**PyTorch Overview and Examples**	**Understand the basics of the PyTorch framework implement example**	**Develop a PyTorch Application**
5	**Topic**	**Hadoop Overview and Examples**	**Understand the basics of the Hadoop framework implement example**	**Develop a Hadoop Application**
6	**Final Project Review Week**			
7	**Final Written Reporting and Oral Presentation**			