Day	Time	Activity	Type	Teacher	Description	Where
Monday 6.02.2023	**08:15**	**Please wait punctually at 8.15 AM** in the Main Building of the Warsaw University of Technology (ground floor, next to the cloakroom) **Adress: Plac Politechniki 1**				
Monday 6.02.2023	08:30 – 09:15	**1) Welcome to ENHANCE Winter School** Prof. Jan Słyk, Vice-Rector for Academic Affairs, Warsaw University of Technology Katarzyna Aleksy, Director of Programmes for Institutions, National Agency for Academic Exchange Prof. Wojciech Domitrz, Dean of the Faculty of Mathematics and Information Science, Warsaw University of Technology **2) Opening Lecture "From Data to Knowledge - a winding path with highs and lows"** Prof. Jarosław Arabas, Faculty of Electronics and Information Technology, Warsaw University of Technology				**ROOM 123** **Warsaw University of Technology Main Building, adress: Plac Politechniki 1** (sala 123, Gmach Główny Politechniki Warszawskiej, Plac Politechniki 1)
	09:30 – 11:00	Python – introduction.	Workshop.	Anna Cena, Ph.D., Faculty of Mathematics and Information Science Kuntur Soveatin Safdar Muhammad Farhan	Basics of programming in Python 3: introduction to Jupyter Notebook (or Spider), input and output of data, control flow statements (conditional instructions, loops). Students will write 1 – 2 simple scripts.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	11.00 – 11.15				Coffee break	
	11:15 – 12:50	Functions. Exceptions.	Workshop.	Anna Cena, Ph.D., Faculty of Mathematics and Information Science Kuntur Soveatin Safdar Muhammad Farhan	Functions: how to use them, how to write them. Objects in Python: attributes and methods. Exceptions and how to deal with them. Students will write 1 – 2 functions on their own.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	13:00 – 17:00	**Trip to CEZAMAT (on-site 14.00-16.00)** by METRO (from station METRO POLITECHNIKA to station IMIELIN) + BUS nr 148 (from metro station IMIELIN to TANGO bus stop) - Intelligent Semiconductor Systems Department (SEMINSYS) CEZAMAT presentation (hall 1.47, on the ground floor) - SEMINSYS lab tour				**CEZAMAT hall 1.47, on the ground floor** adress: ul. Poleczki 19
Tuesday 7.02.2023	09:00 – 9:15				Coffee break	
	9:15 – 11:00	Numpy. Pandas.	Workshop.	Anna Cena, Ph.D., Faculty of Mathematics and Information Science Kuntur Soveatin Safdar Muhammad Farhan	N-dimensional arrays in NumPy. Pandas DataFrame: most important methods (head, sort_values, groupby etc.). Data wrangling – exercises.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	11:00 – 12:30	File processing. Text processing.	Lecture.		File processing: reading, writing files of different types (.csv, .xml), searching, copying, renaming. Attribute str in pandas DataFrame. Basic methods to work with strings (split, join, search, replace, detect, extract).	
	12:30 – 13:30				Lunch	
	13:30 – 15:00	Project	Teamwork.	Anna Cena, Ph.D., Faculty of Mathematics and Information Science Kuntur Soveatin	Part 1 of the project: preparing code in Python that allows to read .xml data files.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	15:00 – 15:15				Coffee break	
	15:15 – 16:45	Visualizations in Python.	Workshop.	Anna Cena, Ph.D., Faculty of Mathematics and Information Science Kuntur Soveatin	Basic types of plots (boxplot, histogram, pie and bar plot, heatmaps). Method .plot() in pandas and package matplotlib.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
Wednesday 8.02.2023	09:00 – 09:15				Coffee break	
	9:15 – 12:30	Introduction to Machine Learning.	Workshop.	Anna Wróblewska, Ph.D., Faculty of Mathematics and Information Science Danilenka Anastasiya Safdar Muhammad Farhan	Classification and regression models. Evaluation metrics. Data pre-processing.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	12:30 – 13:30				Lunch	
	13:30 – 15:00	Practical exercises (Machine Learning)	Tutorials.	Anna Wróblewska, Ph.D., Faculty of Mathematics and Information Science, **up to 14:30** Danilenka Anastasiya Kuntur Soveatin	Practical exercises in machine learning methods using datasets of different types as exemplary data sets.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	15:00 – 15:15				Coffee break	
	15:15 – 16:45	Practical exercises (Machine Learning)	Tutorials.	Danilenka Anastasiya Kuntur Soveatin	Practical exercises in machine learning methods using exemplary data sets.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	17:30				Informal dinner	
Thursday 9.02.2023	09:00 – 09:15				Coffee break	
	09:15 – 12:30	Introduction to Deep Learning	Workshop.	Anna Wróblewska, Ph.D., Faculty of Mathematics and Information Science Danilenka Anastasiya	Neural networks. Deep learning.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	12:30 – 13:30				Lunch	
	13:30 - 14:15	Axiological and legal conditions for the collection and processing of personal data	Lecture with moderated discussion	Dominik Sypniewski, Ph.D., Faculty of Administration and Social Sciences	The collection and processing of metadata are processes inextricably linked to digitalisation and globalisation. These processes pose a threat to the protection of individuals' rights while creating moral hazard for corporate organisations. The conflicts of values and the de facto asymmetry determine the need for legislative intervention and the placing of these processes in a legal framework. During the lecture, I will present the assumptions of this legal framework, using examples from practice related to the implementation of the GDRP. We will also discuss the hierarchy of values and the legitimacy of regulation in this area.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	14:15 – 15:00	Practical exercises (DL)	Tutorials.	Anna Wróblewska, Ph.D., Faculty of Mathematics and Information Science, **up to 14:30** Kuntur Soveatin Danilenka Anastasiya	Practical exercises in deep learning methods using exemplary data sets.	
	15:00 – 15:15				Coffee break	
	15:15 – 16:45	Project	Teamwork.	Anna Cena, Ph.D., Faculty of Mathematics and Information Science Danilenka Anastasiya	Prepare project data for analysis. Explanatory analysis.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
Friday 10.02.2023	09:00 – 09:15				Coffee break	
	09:15 – 12:30	Introduction to Natural Language Processing.	Workshop.	Anna Wróblewska, Ph.D., Faculty of Mathematics and Information Science Kuntur Soveatin Danilenka Anastasiya	Models and methods for NLP. Text representation models, e.g. word embeddings, topics.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	12:30 – 13:30				Lunch	
	13:30 – 15:00	Practical exercises (NLP)	Tutorials.	Anna Wróblewska, Ph.D., Faculty of Mathematics and Information Science, **up to 14:30** Kuntur Soveatin Danilenka Anastasiya	Practical exercises in machine natural language processing using exemplary data sets.	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.
	15:00 – 15:15				Coffee break	
	15:15 – 16:45	Project	Teamwork.	Kuntur Soveatin Danilenka Anastasiya	Work on project & consultation .	**Level -1, room 039** at Faculty of Electronics and Information Technology, adress: ul. Nowowiejska 15/19.