

**Module number:** M8**Name of the module:** Big data analysis and pattern recognition**Responsible:** P12-KU (P11, P13)

ID	Didactic modules (Teaching materials)	Comments	THEO (D3.4)	PRAC (D3.5)	THEO hours	PRAC hours	Total of Hours	LEADER	Contributor	Interested
M8	Big data analysis and pattern recognition		21	18				P12-KU		P11, P13

Total number of hours: 39h (Theory: 21h, Practice: 18h)**Aims:**

The aim of this module is to present the theoretical and practical Big data analysis and pattern recognition. The students will gain a broad understanding of how analyze data collected from industrial process. They will have a chance to use PLCnext and other devices to extract data from the ETAT Smart Lab environment to deposit in cloud platforms. Therefore, the students can experience 1). concept and practice of data science in Industrial using technology to derive the key answers for decision making, 2). background of knowledge in methodology and classification rule for data mining, 3). basic concept of operation in production and service of manufacturing information system, 4). expert system shall be applied to problem solving, planning and controlling etc., 5). determining source, acquisition, integration, transmission of knowledge.

Programme:Lecture: (21 h)

- (1h) Introduction: Data Analysis for industry, Identifying data pattern
- (2h) Data extraction, data preparation (ETL process) for data engineer processes
- (4h) SQL for Database
- (3h) Data analytics with Machine learning
- (2h) Statistics for data modeling
- (2h) Build Decision support system
- (3h) Data mining technology
- (2h) Data visualization
- (2h) Big Data

Practice: (18h)

- (2h) Introduction to ETAT Smart Lab
- (2h) Installation of all connected hardware devices
- (2h) Extract data on case study with ETAT Smart Lab
- (2h) Build Data Modelling

- (2h) Finalizing and measuring the efficiency of the built model
- (4h) Using the model together with implementing the model in an application.
- (4h) Construct a dashboard for Business intelligent.

Using various industrial protocols together

Assessment method:

- Questionnaire for learning contents and using ETAT Smart Labs
- Results of theoretical pre-/post test
- Results of practical work

Prerequisites:

- Programming fundamentals
- Database fundamentals

Expected Learning Outcomes (ELOs):

- Knowing industrial devices and technology
- Knowing data analysis for industrial correctly
- Aware of problem solving, planning and controlling

Datum:

10.02.22

Absender:

TATU team
FH Düsseldorf / FB Elektrotechnik

Empfänger:

TATU project partners