



## Subject: Exploiting Organizational Data by Data and Process Mining

### SYLLABUS

#### Topic 1. Extracting and pre-processing raw data from organization-wide IT systems

- 1.1. Business Process Management Systems (BPMS);
- 1.2. Enterprise Resource Planning (ERP);
- 1.3. Client Relationship Management (CRM);
- 1.4. Web sites.

#### Topic 2. Data Mining

- 2.1. Clustering techniques;
- 2.2. Pattern Discovery and Association Rules;
- 2.3. Extracting Decision Trees;
- 2.4. Linear Regression.

#### Topic 3. Process Mining

- 2.1. Process modeling notations: Business Process Model and Notation (BPMN, Petri Nets);
- 2.2. Process mining algorithms: Alpha Algorithm, Fuzzy Algorithm;
- 2.3. Conformance checking: Play-in and Play-out;
- 2.4. Process enhancement: simulation and performance prediction, bottleneck detection.

#### References:

1. van der Aalst W.M.P.: Process Mining: Discovery, Conformance and Enhancement of Business Processes, ed. Springer Verlag, 2011
2. Dumas, M., La Rosa, M., Mendling, J., Reijers, H.A.: Fundamentals of Business Process Management, ed. Springer, Berlin, 2013
3. Zaki, M. J., Wagner Meira Jr.: Data Mining and Analysis: Fundamental Concepts and Algorithms, ed. Cambridge University Press, 2014
4. van der Aalst, W.M.P., Weijters, A.J.M.M., Maruster, L.: Workflow Mining: Discovering Process Models from Event Logs. IEEE Transactions on Knowledge and Data Engineering 16(9), 1128-1142, 2004
5. Günther, C.W., and van der Aalst., W.M.P. Fuzzy mining-adaptive process simplification based on multi-perspective metrics, Business Process Management. Springer Berlin Heidelberg, pp.328-343, 2007