E-INFRASTRUCTURES AUSTRIA DELIVERABLE Cluster K

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Data Literacy Curriculum

Data Literacy for Information Professionals Education

Work-Package-Cluster:	Cluster K: Data from scientific and artistic-scientific research processes
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Description (English):	The following data literacy module results from the Cluster K "Data Librarian" working group that has been active between September 2015 and June 2016. The goal was to suggest two modules which can supplement current librarian/information professional courses at Austrian Universities. It should qualify information professionals and students to deal with digital transformation effects and

	rapidly changing information services and technologies. It should teach how to apply basic technologies and methods required in the main stages of a data-driven knowledge production lifecycle.

Keywords (English):	data science, information professionals, data literacy
Related Documents:	Blumesberger et al, Modulare Stellenbeschreibung "Repository Manager" (w/m), 2015 (Unpublished) [Report] COAR Task Force, Librarians' Competencies for E-Research and Scholarly Communication, June 2016 (Unpublished)

1. Introduction

The following data literacy module results from the Cluster K "Data Librarian" working group that has been active between September 2015 and June 2016. The goal was to suggest two modules which can supplement current librarian/information professional courses at Austrian Universities. It should qualify information professionals and students to deal with digital transformation effects and rapidly changing information services and technologies. It should teach how to apply basic technologies and methods required in the main stages of a data-driven knowledge production lifecycle.

1.1 Basic Module

We recommend this module to be included in a bachelor study syllabus as it gives a broad introduction into key theories, methods and tools required in each stage of a data-driven knowledge production lifecycle. The basic module covers essential knowledge, which we deem to be of growing importance for current and future generations of information professionals.

1.2 Advanced Module

We recommend this module to be included in a master study syllabus as it offers students the possibility to specialise in various areas of the data-driven knowledge production lifecycle including data aggregation, analytics, and visualization to data publication, long-term preservation and data reuse. The module was designed to cover all stages of the data-driven knowledge production lifecycle, but it is not required to absolve all modules to complete the master. Students may choose in which two areas they want to gain more insight and knowledge which can substantially support them in future practice.

Courses in both modules have a **strong hands-on aspect** and focus on practical applicability of tools and methods based on a **basic understanding of underlying theoretical concepts**.

2. Module X: Basic Data Literacy

2.1 Learning Objective

The proposed basic data literacy module gives a broad insight into key theories, methods and tools required in each stage of a data-driven knowledge production lifecycle.

2.2 Courses

- **X.1. Data-driven Knowledge Production and Organisation**
  - Effort: 2 hours/week | Type: lecture | Examination: exam | 2 ECTS
  - *Learning objectives: students will get an introduction to the data-driven knowledge production lifecycle and to basic data format, storage, and documentation standards.*
- **X.2. Methods and Tools**
  - Effort: 2 hours/week | Type: lecture/lab exercise | Examination: exam | 2 ECTS
  - *Learning objectives: students will get a low-level introduction to data aggregation, analytics, and visualization methods and tools that can be applied throughout these stages.*

3. Module Y: Advanced Data Literacy

3.1 Learning Objective

The proposed advanced data literacy module gives students the possibility to specialise in various areas of the data-driven knowledge production lifecycle including data aggregation, analytics, and visualization to data publication, long-term preservation and data re-use. At least two of the following modules need to be absolved.

3.2 Courses

- **Y.1 Introduction to Programming**
  - Effort: 2 hours/week | Type: lecture/lab exercise | Examination: exam | 2 ECTS
  - *Learning objectives: students will learn basic programming skills and know how to apply them for data handling using scripting languages like Python.*
- **Y.2. Data Aggregation and Linkage**
  - Effort: 2 hours/week | Type: lecture/lab exercise | Examination: exam | 2 ECTS

- *Learning objectives: students will learn how to aggregate data in different formats from various sources. This involves use of APIs, data cleansing and normalization, data linkage, data quality control, and novel Web-based data representation approaches (e.g., Linked Data)*

Y.3. Data Analytics

- Effort: 2 hours/week | Type: lecture/lab exercise | Examination: exam | 2 ECTS
- *Learning objectives: students will learn how to design simple statistical models for performing automated classification and prediction tasks. This involves understanding of basic statistical concepts and application of standard tools and frameworks.*

Y.4. Data Visualisation

- Effort: 2 hours/week | Type: lecture/lab exercise | Examination: exam | 2 ECTS
- *Learning objectives: students will learn methods and tools for visualizing results of data-driven knowledge production processes. This includes understanding of fundamental information visualization and user centered design approaches.*

Y.5. Data Publication and Preservation

- Effort: 2 hours/week | Type: lecture/lab exercise | Examination: exam | 2 ECTS
- *Learning objectives: students will get advanced training on data and metadata standards, data documentation practices and data management planning, as well as an introduction to data storage and preservation.*

Y.6. Information System Management and Policy

- Effort: 2 hours/week | Type: lecture | Examination: exam | 2 ECTS
- *Learning objectives: students will learn about current information systems development and management practices (e.g., software development, systems life cycle) and have the ability to manage and control such processes.*

4. Related Documents

Blumesberger et al, Modulare Stellenbeschreibung "Repository Manager" (w/m), 2015 (Unpublished) [Report]: http://eprints.rclis.org/25436/ [retrieved in 2016-06-17]

COAR Task Force, Librarians' Competencies for E-Research and Scholarly Communication, June 2016 (Unpublished): https://www.coar-repositories.org/activities/support-and-training/task-force-competencies/ [retrieved in 2016-06-17]

e-Infrastructures Austria

Nachhaltige Datensicherung und das Bereitstellen von Daten für Dritte ist eine zentrale Aufgabe der Wissenschaft. e-Infrastructures Austria ist ein vom Bundesministerium für Wissenschaft, Forschung und Wirtschaft (MBWFW) gefördertes Hochschulraumstrukturmittel-Projekt für den koordinierten Ausbau und die Weiterentwicklung von Repositorien in ganz Österreich. Dadurch wird die sichere Archivierung und dauerhafte Bereitstellung von elektronischen Publikationen, Multimedia-Objekten und anderen digitalen Daten aus Forschung und Lehre gewährleistet. Eng damit zusammenhängend werden Themen im Bereich Forschungsdatenmanagement und Workflows von digitaler Archivierung bearbeitet.

Cluster A	Monitoring und Austausch zum Aufbau von Dokumentservern in den lokalen Einrichtungen *Patrick Danowski (IST Austria)*
Cluster B	Planung und Durchführung einer österreichweiten Umfrage zu Forschungsdaten *Christian Gumpenberger (Universität Wien)*
Cluster C	Aufbau eines Wissensnetzwerks: Erarbeitung eines Referenzmodells für den Aufbau von Repositorien *Paolo Budroni (Universität Wien)*
Cluster D	Aufbau Infrastruktur *Raman Ganguly (Zentraler Informatikdienst Universität Wien)*
Cluster E	Legal and Ethical Issues *Seyavash Amini (Rechtsberater Universität Wien)*
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