Lecture 1 – Course Overview

Advanced Data Management

Data Science and Scientific Computing / UniTS – DMG

Scientific and Data-Intensive Computing / UniTS – DMG

Lecturers & contacts

- Lecturers
  - Istituto Nazionale di Astrofisica (INAF)
    - Andrea Bignamini - andrea.bignamini@inaf.it
    - Marco Molinaro - marco.molinaro@inaf.it
    - Marco Frailis - marco.frailis@inaf.it
  - AREA Science Park
    - Stefano Cozzini - stefano.cozzini@areasciencepark.it

- Moodle@UniTs --> Lecture materials
- Microsoft Teams --> Live recordings

Lecture “blocks”

- Introduction
- Data and Metadata Models & Structures
- Data Infrastructures
- Data Resource Interoperability and Access

Description of the course & lessons (1)

- Introduction
  - Big Data
  - Open Data
  - FAIR principles

- Data and Metadata Models and Structures
  - data models
    - definitions and design
  - data structures and metadata
  - UML, ORM, XML, XSD, JSON, data structure formats, tabular formats, images, hierarchical structures, including metadata query-ability.

Description of the course & lessons (2)

- Data Infrastructure
  - Large scale data infrastructure and hardware/software stack for large data management
  - Parallel and distribute storage
  - Cloud storage and associated services
  - tutorials: data management services and tools on the top of data infrastructure
  - seminars: the data management approach within the life science and material science
- Interoperability
  - (Persistent) Identifiers
  - (Resource) Catalogues
  - Data models for Discovery
  - Data Curation & Preservation
  - Interfaces & Dataset Access

Lessons' Calendar

March

M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

April

M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

May + June

M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

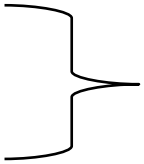
- Bignamini
- Frailis
- Cozzini
- Molinaro

- Introduction
- Data and Metadata Models and Structures
- Data Infrastructure
- Data Resource Interoperability and Access

Tuesday: 13-15 (0B - H3)
Thursday: 11-13 (Classroom 5A - H2bis)
Friday: 10-12 (Classroom 5C - H2bis)

Knowledge verification

- Preparation of a small “project” on data management
  - Using everything that has been learned during the course
    - Definition of data model and data structure
    - Interoperability
    - Possible solutions of distributed data infrastructure
    - Data storage and long term preservation
    - Data access
    - …
    - …
    - ...



Fill with all the course topics

  - Critical approach to the project with respect to the themes addressed during the lessons
  - Possibly showing some real snippets or ideas of implementation
- Presentation of the project to the class & lecturers
  - Slides in English
  - With dedicated Q&A time
- There are no fixed date for the exams
  - Contact us to agree on the project details
  - Send us an email to agree on a date

Survey & Discussion

- Organisational set-up
  - Register on Moodle@UniTs
  - Join on Microsoft Teams (code k7370o0)
  - Do you have any requests?
- Fill in the survey form
  - Discuss it
- Open discussion on the expectations
- (and/or) insights on the course content