Ontologies and Taxonomies in Research Data Management Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today’s data-intensive research landscape, the ability to structure, organize, and retrieve information effectively is critical. Ontologies and Taxonomies in Research Data Management Training Course empowers professionals, scholars, and institutions with the tools and knowledge to design, apply, and manage semantic frameworks that enhance data interoperability, metadata annotation, and knowledge discovery. With the growing emphasis on FAIR (Findable, Accessible, Interoperable, Reusable) data principles, mastering ontologies and taxonomies has become essential for data-driven decision-making and collaborative research.

This course delivers a deep dive into the theories, tools, and technologies shaping research metadata, ontology development, classification systems, and linked data. Participants will learn to apply domain-specific taxonomies, design semantic models, and leverage tools like OWL, Protégé, and SKOS for data annotation and management. Through practical case studies and hands-on modules, learners will build skills to future-proof their research infrastructure and facilitate advanced data integration, knowledge graphs, and AI-enhanced data processing.

Programme Curriculum

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Course Objectives

1. Understand the fundamentals of ontologies and taxonomies in data management.
2. Explore semantic web technologies and their application in research data.
3. Build and apply controlled vocabularies for metadata annotation.
4. Implement FAIR data principles using structured metadata.
5. Utilize ontology engineering tools such as Protégé and OWL.
6. Create domain-specific taxonomies to improve data discovery.
7. Apply linked data and RDF for enhanced knowledge integration.
8. Analyze real-world case studies in research data curation.
9. Design interoperable metadata schemas using standards like Dublin Core.
10. Integrate AI and machine learning with semantic data structures.
11. Use SKOS for taxonomy representation and management.
12. Improve research collaboration through standardized vocabularies.
13. Evaluate and assess the quality and performance of ontologies.

Target Audiences

1. Research Data Managers
2. Data Scientists and Analysts
3. Academic Researchers
4. Digital Librarians
5. Information Architects
6. Institutional Repository Managers
7. Metadata Specialists
8. Government and NGO Policy Analysts

Course Duration: 5 days

Course Modules

Module 1: Introduction to Ontologies and Taxonomies

- Definitions and foundational concepts
- Importance in research data lifecycle
- Historical development and standards
- Overview of key frameworks (OWL, SKOS)
- Classification vs. categorization
- **Case Study**: Building an academic research taxonomy for institutional repositories

Module 2: Ontology Engineering and Design

- Ontology development lifecycle
- Key components: classes, properties, individuals
- Ontology languages (OWL, RDF, RDFS)
- Best practices in ontology modeling
- Tools: Protégé, WebProtégé
- **Case Study**: Designing a biomedical ontology using Protégé

Module 3: Taxonomy Structures and Applications

- Hierarchical and faceted taxonomies
- SKOS modeling for taxonomies
- Controlled vocabularies vs. thesauri
- Integration with search and retrieval systems
- Maintaining and evolving taxonomies
- **Case Study**: Taxonomy creation for environmental data indexing

Module 4: Metadata Standards and Interoperability

- Dublin Core, MODS, and schema.org
- Metadata schemas and crosswalks
- Linked open data and semantic annotation
- Enhancing data findability with standards
- Metadata harvesting and reuse
- **Case Study**: Metadata interoperability in digital heritage archives

Module 5: Semantic Web Technologies and Tools

- Introduction to RDF and SPARQL
- Semantic annotation using ontologies
- Triple stores and reasoning engines
- Ontology alignment and mapping
- Semantic search applications
- **Case Study**: Using SPARQL for querying agricultural research data

Module 6: FAIR Data and Knowledge Organization

- Overview of FAIR principles
- Role of ontologies in FAIR compliance
- Annotating datasets for reusability
- Creating machine-readable metadata
- FAIR assessment tools and metrics
- **Case Study**: FAIRifying clinical trial data using semantic metadata

Module 7: Integration with AI and Machine Learning

- Role of ontologies in training datasets
- Semantic enrichment and automated annotation
- Knowledge graphs in machine learning
- Interoperability between AI tools and ontologies
- Use of ontologies for explainable AI
- **Case Study**: Integrating ontologies with AI models in health informatics

Module 8: Governance, Evaluation, and Sustainability

- Ontology governance models
- Evaluation metrics for ontologies
- Community engagement and consensus building
- Lifecycle management and version control
- Funding and policy for sustainability
- **Case Study**: Governance framework for national research data infrastructures

Training Methodology

- Interactive expert-led lectures

- Hands-on lab sessions using Protégé and RDF tools
- Case-based learning and peer discussions
- Group activities and taxonomy design workshops
- Self-paced assignments and quizzes
- Live Q&A with ontology specialists

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

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