

# Course Syllabus

## Syllabus of CS 489/589 Semantic Web and Open Data

### Admin Info and Learning Objectives

<b>Title:</b>	<b>Semantic Web and Open Data</b>
<b>Class number:</b>	<b>CS 489/589</b>
<b>Class time:</b>	<b>Tuesday &amp; Thursday: 02:00PM-03:15PM</b>
<b>Class location:</b>	<b>EP #209 or Zoom: <a href="https://uidaho.zoom.us/j/89073993250">https://uidaho.zoom.us/j/89073993250</a> [log in with Univ. Idaho accounts / SSO]</b>
<b>Instructor:</b>	<b>Xiaogang (Marshall) Ma, Associate Professor at CS Dept.</b>
<b>Instructor contact:</b>	<b>Office: JEB #230; Email: <a href="mailto:max@uidaho.edu">max@uidaho.edu</a>; Office phone: 208.885.1547</b>
<b>Office hours:</b>	<b>Tuesday &amp; Thursday: 03:45PM-04:30PM, JEB230 or <a href="https://uidaho.zoom.us/j/89073993250">https://uidaho.zoom.us/j/89073993250</a></b>

### Synopsis

The World Wide Web significantly facilitated digital connectivity and human transactions in the past two decades. The Semantic Web further extends the core principles of the Web to make the meaning of data machine-readable. It provides a common framework in which data can be annotated, inter-linked, shared, discovered and reused across application, enterprise, and community boundaries. Collections of interrelated datasets in the Semantic Web are called Linked Data. Linked Open Data is Linked Data released under an open license. Groups and individuals are increasingly publishing and/or utilizing data available on the Web. The technological framework and associated functionalities enabled by the Semantic Web and the Linked Open Data provide a space for large scale data integration, reasoning and analysis. They also establish the foundation for leveraging existing data science methods and revolutionizing domain-specific applications, such as those in government data, news archive, bioinformatics, geoinformatics, and more.

### Learning Objectives

1. **Understand** the fundamental concepts in Semantic Web, such as ontology, RDF, OWL, logic reasoning, ontology engineering, knowledge graph, Linked Data, SPARQL, Open Data, as well as the inter-relationships among those concepts. Through independent learning and collaborative discussion with classmates, student will attain an integrative overview of Semantic Web and Linked Open Data.
2. **Develop and Demonstrate** skills for steps in building and using the Linked Open Data, including ontology engineering, data query, analysis and output generation. Students will learn and improve their skills with real world examples and work in groups of classmates on domain-specific applications.
3. **Publication and communication** of data and information products. Students will learn state-of-the-art technologies in data analysis and visualization, and work in groups to prepare and present the outputs of course projects. Students will discuss and learn ethical concepts such as privacy,

intellectual property, and responsibility in Semantic Web and apply those as guidelines in their course projects.

### Suggested Textbook

- Antoniou, G., Groth, P., van Harmelen, F., Hoekstra, R., 2012. A Semantic Web Primer, Third Edition. MIT Press. ISBN: 9780262018289. [\[Full text access through UI library\]](#) <https://ebookcentral.proquest.com/lib/uidaho/detail.action?pq-origsite=primo&docID=3339488>] - suggested for quick read
- Allemang, D., Hendler, J., Gandon, F., 2020. Semantic Web for the Working Ontologist: Effective Modeling for Linked Data, RDFS, and OWL (3rd Ed.). ACM, New York. ISBN:978-1-4503-7617-4. [\[Full text access through UI library\]](#) <https://ebookcentral.proquest.com/lib/uidaho/detail.action?pq-origsite=primo&docID=6954879>] - suggested for use as reference of technical items for the whole course

### Course Schedule

1. The Semantic Web Vision
2. Structured Web Documents

Assignment 1 Annotate a personal webpage using schema.org

3. Describing Web Resources in RDF
4. Web Ontology Language
5. Ontology Engineering

Assignment 2 Build and present an ontology

6. Good and Bad Modeling Practices
7. The Open Data Environment
8. Querying the Linked Open Data

Assignment 3 Design and implement a query example

9. Ontology Assignment Presentation
10. Logic and Inference

Assignment 4 Course project

11. Simple Knowledge Organization System
12. Semantic Web Application Architecture
13. Applications 1: Metadata, Data Publication, Provenance and Open Government Data
14. Applications 2: Web Content Mining, Similarity Computation and Entity Linking
15. Fall Recess - NO CLASS (November 25-29, 2024)
16. Course Project Presentation

## 17. Last week of semester - NO CLASS

### Assessment Method

#### Learning Activities:

- Attendance and participation in lectures
- Reading and writing assignments
- Class exercises and group discussion/presentation
- Course project

#### Grading Criteria:

The grading (A/B/C/D/F) is based on the student learning activities.

- 20% Attendance
- 35% Class exercise and assignment
- 45% Class project report and presentation