Course Name	Semantic Web and Ontology Engineering		**الهندسة الدلالية وشبكات المعاني**	
Course Information	**Course Code**	**Course No.**	**Credit Hour**	**Prerequisite(s)**
	0911-1672	672	3 (3-0-6)	Data Processing and Analytics
Course Track	☐ Program Core		☒ Electives	

Course Description. The current web has experienced massive amount of data in different formats (i.e. text, speech, images, video, maps) that are difficult for machines to understand. World Wide Web Consortium (W3C) is the main international standards organization for the World Wide Web that promotes for machine-understandable data targeting better web version called "Semantic Web" (or Web 3.0). The Semantic Web is an advanced development of the World Wide Web wherein the meaning (semantics) of data distributed over the Web. This course begins with an introduction about the Semantic Web technology in terms of the theory, practice, and architecture. Then, it includes Semantic Web languages, Resource Description Framework (RDF), Web of data, semantic annotation, and storage and querying. Next, the topics of Web ontology language, rule interchange format, and reasoning on the Web. Ontology development and evolution, and its applications are covered as well. Students will be introduced to many leading edge solutions for the semantic web tools including semantic crawlers, ontology editors, annotation tools linked open data, knowledge graphs, etc. Applications may include validation of Semantic Web technologies in real life case studies, in particular, Dr. Watson, Yahoo! Search Monkey, ACTIVE case study, INSEMTIVES case studies, and LARKC case study.

Course Outcomes. After the completion of this course, the student will be able to:

1. **Describe** the theory and overall architecture of the semantic web technologies. **[A]**
2. **Understand** ontology engineering methodologies and ontology engineering tools. **[C]**
3. **Model** and design ontologies using web ontology language. **[B]**
4. **Implement** semantic-web based applications using different web tools in a diversity of case studies. **[D, E]**
5. **Analyze** the limitations of the semantic web technologies and ethical concerns. **[F]**

Assessment Policy (TC)	**Assignments**	10%	**Quiz**	10%	**Capstone Project**	20 %
	Midterm	20%	**Final**	40%		

Textbook	Antoniou, Grigoris, Paul Groth, Frank van Harmelen, and Rinke Hoekstra. "Semantic Web Primer", 3rd Edition. MIT Press, Cambridge, MA, 2012. ISBN 978-0-262-01828-9.
References	1. Péter Szeredi, Gergely Lukácsy, Tamás Benkő, "The Semantic Web Explained — the technology and mathematics behind Web 3.0", Cambridge University Press (2014), ISBN: 9780521700368 2. Pascal Hitzler, Aldo Gangemi, Krzysztof Janowicz, Adila Krishnadi, Valentina Presutti, "Ontology Engineering with Ontology Design Patterns: Foundations and Applications", IOS Press (2016), ISBN: 9781614996750