COURSE OUTLINE

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	7.024	**SEMESTER**	7th
COURSE TITLE	Knowledge Representation on the World Wide Web		

COURSEWORK BREAKDOWN	TEACHING WEEKLY HOURS	ECTS Credits
Theory (Lectures)	4	3
Tutorial		
Exercises	1	1
TOTAL	**5**	**4**

COURSE UNIT TYPE	Deepening / Consolidation of specialty knowledge
PREREQUISITES	
LANGUAGE OF INSTRUCTION/EXAMS	Greek
COURSE DELIVERED TO ERASMUS STUDENTS	Yes
WEB PAGE (URL)	https://eclass.hmu.gr/courses/ECE137/

(2) LEARNING OUTCOMES

LEARNING OUTCOMES

The aim of this course is that students understand the representation and the process of knowledge in the Semantic Web. The Semantic Web is an evolving extension of the World Wide Web, in which the meaning of the information and the services on the web are defined. Several enabling technologies has been developed to define standard specifications in the data exchanged on the Internet. Such technologies are the resource description framework (RDF), a variety of shapes of data exchange (e.g. RDF / XML, N3, Turtle, n-tripling), and notes like the shape RDF (RDFS) and the ontology language for the Web (OWL). All Theses aim to provide a formal description of concepts, terms and relationships within a given area of knowledge.

1. Use Resource Description Framework (RDF) technology

2. Use Web Ontology Language (OWL) technology,

3. To produce / describe ontologies in limited areas,

4. Implement them using Protégé and use them,

5. Understand the reasons for the expansion of web technologies with semantic models, ontologies and inference systems.

General Skills

- Autonomous & Independent work
- Teamwork
- Search, analysis and synthesis of data and information, using the necessary technologies
- Decision making
- Promoting liberal, creative and inductive/deductive thinking
- Work in an interdisciplinary environment
- Adapt to new situations
- Project Planning and Management

(3) SYLLABUS

Theoretical Lecture Units

The aim is to provide a formal description of concepts, terms and relationships within a given area of knowledge representation.

Indicative Syllabus

- Technology of Semantic Web
- Introduction
- XML
- RDF - RDFS
- OWL
- Query Languages

- Query Languages (xquery, RQL SERQL, SPARQL)
- Search on the Semantic Web
- Knowledge Representation and Reasoning
- Description logic
- Reasoners

Laboratory Exercises

In the workshop students will develop individual and group work using the above technologies using the Protégé tool.

(4) TEACHING METHODS – ASSESSMENT

MODE OF DELIVERY	In-Class Face-to-Face
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	▪ Use of ICT in teaching ▪ Use of ICT in laboratory training ▪ Use of ICT in communicating with students through the electronic platform e-class

TEACHING ORGANIZATION		
	Method description/Activity	**Semester Workload**
	Lectures	52
	Laboratory	13
	Non-guided personal study	15
	Small individual theoretical exercise	15
	Group laboratory exercise	15
	Weekly individual exercise	10
	Total Contact Hours	**120**

ASSESSMENT METHODS	Language of Evaluation: Greek Evaluation methods: 1. Written final exam (40%) • by solving problems • with multiple choice questions 2. Group theory work (report and oral examination) (25%) 3. Laboratory group work (report and oral examination) (20%) 4. Weekly home-exercises (15%) The evaluation criteria are announced to the students at the beginning of the semester and are posted on the course website in eClass.

(5) RECOMMENDED BIBLIOGRAPHY

-Recommended Bibliography:

- *Εισαγωγή στο Σημασιολογικό Ιστό, Γρηγόρης Αντωνίου και Frank van Harmelen, 2009, Κλειδάριθμος, ISBN 978-960-461-234-5*

- *A Semantic Web Primer, third Edition , by Grigoris Antoniou, Paul Groth,Frank van Harmelen and Rinke Hoekstra, 2012, MIT Press, ISBN 978-0-262-01828-9*
- *Programming the Semantic Web by Toby Segaran, Colin Evans, Jamie Taylor, and Segaran Toby,2009,O'Reilly, ISBN 978-0596153816*
- *Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL, by Dean Allemang and James Hendler,2008, Morgan Kaufmann, ISBN-13: 978-0123735560*
- *Semantic Web Programming by John Hebeler, Matthew Fisher, Ryan Blace, and Andrew Perez-Lopez, 2009,Wiley, ISBN 978-0470418017*
- *Semantic Web For Dummies, by Jeffrey T. Pollock, 2009,For Dummies, ISBN: 978-0470396797*

- ***Relevant Scientific Journals:***

- *Journal of Web Semantics*
- *Semantic Web and Information Systems*