University of Computer Studies, Yangon
M.C.Sc. (Knowledge Engineering)

CS-604 (Semantic Web)

Second Semester

COURSE DESCRIPTION

Course code number	CS- 604	Course Title	Semantic Web
Semester hours	3 hours	Credit Units	3
Prerequisite	-	Course Coordinator	Dr. Thi Thi Soe Nyunt Faculty of Computer Science

Course Aims

The aim of this course is to understand the students the concepts, technologies that making up the Semantic Web. In this course students will study introduction to the Semantic Web and Ontologies, Ontology languages (RDF, RDF-S and OWL) and Semantic Web Query Languages. Student will also learn how to develop semantic applications.

Learning Outcomes

At the end of the course the student should be able to:

- understand and discuss fundamental concepts of the semantic web
- understand and describe ontologies
- use the RDF framework and associated technologies such as RDF
- understand Semantic Web query languages (SPARQL).
- understand ontological reasoning

Reference Materials:

1. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. By Dean Allemang and Jim Hendler (Ontologist)
2. Semantic Web and Ontology by Dhana Nandini
3. “Foundations of Semantic Web Technologies” by Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph

Course Organization

The expected learning outcomes for the course will be assessed through six forms of activity:

1. Attending the lectures
2. Preparing for and participating in the recitations.
3. Assignments/ Tutorials
4. Reading the text/ Presentation
5. Quiz/ Moodle Test
6. Exams

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Assessment Plan

Final Exam	50%
Assignments	20%
Presentation	10%
Class participation	10%
Tutorial / Quiz	10%

CS-604 : **Semantic Web** Second Semester

Text Books : "Foundations of Semantic Web Technologies" by Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph - ISBN: 9781420090505

Periods : **45 periods for 15 weeks (50 minutes for 1 period)**

No.	Chapter	Week	Remark
	Chapter 1 **The Quest for Semantics**		
1.	1.3 Exchanging Information 1.4 Semantic Web Technologies	Week 1	
	Chapter 2 **Simple Ontologies in RDF and RDF Schema**		
2.	2.1 Introduction to RDF 2.2 Syntax for RDF 2.3 Advanced Features	Week 2	
3.	2.4 Simple Ontologies in RDF Schema 2.5 Encoding of Special Data structures 2.6 An Example 2.7 Summary Exercises Quiz	Week 3	
	Chapter 3 **RDF Formal Semantics**		
4.	3.1 Why Semantics 3.2 Model-Theoretic Semantics for RDF(S)	Week 4	
5.	3.3 Syntactic Reasoning with Deduction Rules 3.4 The Semantic Limits of RDF(S) 3.5 Summary Exercises Quiz	Week 5	
	Chapter 4 **Ontologies in OWL**		
6.	4.1 OWL Syntax and Intuitive Semantics 4.2 OWL Species	Week 6	

7.	4.3 The Forthcoming OWL 2 Standard 4.4 Summary Exercises Quiz	Week 7	
	Chapter 5 **OWL Formal Semantics**		
8.	5.1 Description Logics 5.2 Model-Theoretic Semantics of OWL	Week 8	
9.	5.3 Automated Reasoning with OWL 5.4 Summary Exercises Quiz	Week 9	
	Chapter 6 **Ontologies and Rules**		
10.	6.1 What Is a Rule? 6.2 Data log as a First-Order Rule Language 6.3 Combining Rules with OWL DL	Week 10	
11.	6.4 Rule Interchange Format RIF 6.5 Summary Exercises Quiz	Week 11	
	Chapter 7 **Query Languages**		
12.	7.1 SPARQL: Query Language for RDF	Week 12	
13.	7.2 Conjunctive Queries for OWL DL 7.3 Summary Exercises Quiz	Week 13	
14.	Presentation	Week 14 + 15	
15.	Tutorial	Week 15	