

**Course CS 6315.501 Semantic Web****Professor** Dr. Keven L. Ates**Term** Fall 2015**Meetings** Monday & Wednesday, 7:00pm - 8:15pm, ECSS 2.410**Professor's Contact Information****Office Phone** (972) 883-4523**Office Location** ECSS 4.403**eMail Address** [atescomp@utdallas.edu](mailto:atescomp@utdallas.edu) (use CS 6315.501 in subject line)**Office Hours** <TBD> OR by appointment**General Course Information**

<b>Prerequisites, Co-prerequisites, Co-restrictions</b>	A working knowledge of Java and a BSCS degree or equivalent. Prerequisite: CS 5343 or equivalent. (3-0) S.
<b>Course Description</b>	<p>A brief history of the web and the foundation of the "semantic web" ontology. The Semantic Web stack technologies: (1) URIs &amp; namespaces, (2) XML &amp; XMLS datatypes, (3) RDF, RDF/XML, RDFS, &amp; Individuals, and (4) OWL. Application development using Semantic Web technologies. A SPARQL overview—an RDF query language for heterogeneous data stores. A Jena overview discussing the parts of Semantic Frameworks. A discussion on the OWL dialects Lite, DL, &amp; Full with a concentration on OWL Lite. An introduction to OWL 2 features and profiles EL, QL, and RL. An overview of Semantic Web design patterns.</p> <p>The class consists of programming assignments, exams, a research presentation and a project.</p>
<b>Student Learning Objectives and Outcomes</b>	<p>Upon completion of this course the student will:</p> <ul style="list-style-type: none"><li>• understand and describe ontologies</li><li>• state the reason for the semantic web and its applicability</li><li>• describe RDF and RDFS</li><li>• issue SPARQL queries to retrieve data over heterogeneous sources</li><li>• understand ontological reasoning</li><li>• describe the value of the semantic web versus other federation approaches</li><li>• implement a group project leveraging semantic web techniques</li></ul>
<b>Required Texts &amp; Materials</b>	"Semantic Web Programming", Hebel, et al., Wiley, April 2009 "A Semantic Web Primer" (2 <sup>nd</sup> or 3 <sup>rd</sup> Edition), Antoniou, et al, The MIT Press, 2012
<b>Suggested Texts, Readings, &amp; Materials</b>	"Patterns in Java, Volume 1" (2 <sup>nd</sup> Edition), Grand, Wiley "Head First Design Patterns", Freeman & Robson, O'Reilly "Semantic Web for Working Ontologist: Effective Modeling in RDFS and OWL" (2 <sup>nd</sup> Edition), Allemang & Hendler, O'Reilly, 2008

## **Academic Calendar (Aug 24 – Dec 17)**

Labor Day: Monday, September 7 – No class

Thanksgiving: Thursday, November 26 – Saturday, November 28 – No class

<b>Unit</b>	<b>Topic</b>
<b>1</b>	Introduction to the Semantic Web
<b>2</b>	XML and XML Schema, URIs and Namespaces, Intro to RDF
<b>3</b>	RDF and RDFS, FOAF, and VCard
<b>4</b>	RDF tools, Reification, DublinCore, SPARQL
<b>5</b>	Graph Visualization, OWL, Design Patterns
<b>6</b>	Review, Semantic Wiki
<b>Midterm</b>	<b>Oct 14, 7:00pm – 8:15pm, ECSS 2.410</b>
<b>7</b>	Ontology Alignment, Protege, WordNet, Semantic Similarity
<b>8</b>	RDFS Inference, Semantic Web Application Architecture
<b>9</b>	D2RQ, Federation with Semantic Web
<b>10</b>	OWL 2, Introduction to MapReduce, Case Study or Research Summary Results
<b>Fall Break</b>	Mon., November 23 – Wed., November 25
<b>Project</b>	<b>Due &lt;TBD&gt;; Demo &lt;TBD&gt;</b>
<b>Final Exam</b>	Monday, Dec 14, 2015, 8:00PM – 10:45PM, ECSS 2.410

## **Class Assignments**

There will be regularly assigned reading and homework assignments. Reading assignments should be done before the class lecture. Homework assignment require the student to spend time programming a computer outside of class. Homework assignments require using a preferred OS: Linux, MacOS, and/or Windows. While homework assignments are ungraded, they are for the benefit of the student in preparation for examinations.

## **Project**

This is a team effort, 2-4 students per team. Teams will register their members when the project becomes available on eLearning and the instructor initially discusses the project in class. Each team should submit progress reports on a regular basis coving the tasks as given in the project documentation. At the end of the semester you will present your project to the class. More details will be given in the project documentation and in class.

## **Submissions**

Assignments should be submitted using your eLearning account. At a minimum, each submission should contain the following files:

1. A copy of the source code
2. A report detailing the assignment's code and results. The report should include the following:
  - a. A description of the assignment with a synopsis of the solution including a high-level pseudocode design
  - b. Any additional reporting items such as sample input, output, plots, and diagrams
  - c. A conclusion including any notable observations, errors, and/or special conditions

## **Course Tools**

**Java:** All of the programs we write this semester will be in Java. It is essential that your programs can be run by the TA on his or her system. The student may choose any suitable IDE for development, but Eclipse is recommended.

**Help Desk:** For help with issues regarding your computer, UTD maintains a walk-in help desk. Visit their Web site for details: <http://www.utdallas.edu/ir/helpdesk/>

**Tutoring:** For general programming assistance, a lab is setup each semester. The schedule usually comes out a couple of weeks after the semester begins. In addition, it is part of the TA's job to help you, so please feel free to engage with him or her at any time. And, of course, I'll be happy to help as well.

## **Course Policies**

**Grading (credit)** Homework Assignments: 0% (provided for the benefit of students in preparation for exams)

**Criteria** Team Project: 20%  
Case Study: 10%  
Lab Projects: 20%  
Midterm Exam: 25%  
Final Exam: 25%

Letter Grade Scale (minimum grade required):

A: 90, B: 80, C: 70, D: 60, F: 0

**Make-up Exams** There will be no make-up exams unless previously requested and approved by the instructor before the standard exam. Make up exams are more difficult than the standard exam.

**Extra Credit** Extra credit assignments are not planned, but are at the discretion of the instructor.

**Late Work** No late work will be accepted!

**Class Attendance** Required! Class participation is critical.

**Classroom Citizenship** Difficulties may arise between students as well as student and instructor. However, respect for each other is necessary at all times to maintain a productive learning environment. See the sections "Student Conduct and Discipline" and "Student Grievance Procedures" below.

**Other Policies** The following pages are provided for the student's consideration. Please visit <http://go.utdallas.edu/syllabus-policies> for details and updates on these and other policies.

*These descriptions and timelines are subject to change at the discretion of the instructor.*

## Field Trip Policies: Off-campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address:

[http://www.utdallas.edu/BusinessAffairs/Travel\\_Risk\\_Activities.htm](http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm)

Additional information is available from the office of the school dean.

## Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, A to Z Guide, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student Services and Activities of the university's Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

## Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion, and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of **turnitin.com**, which searches the web for possible plagiarism and is over 90% effective.

## Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

## Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, *the instructor cannot drop or withdraw any student*. You must submit the proper paperwork before the given date and time to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

## Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's Handbook of Operating Procedures.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

## Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

## Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:

The University of Texas at Dallas, SU 22  
PO Box 830688  
Richardson, Texas 75083-0688  
(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

## Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

***These descriptions and timelines are subject to change at the discretion of the instructor.***