COMP 4601

Intelligent Web-based Information Systems

Winter 2018

Lectures:

COMP 4601-A (CB 2202)
Mon. and Wed. 11:35 pm-1:25 pm

Instructor:

Tony White
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HP 5354, 520-2600 x2208

Office Hours: Mon-Wed. 1:30pm-2:30pm

Teaching Assistants:

The TA(s) for this course will be in the Complex Systems Lab **HP 5325** during stated office hours.

Name	Office Hours
Sean Benjamin	in-class

Announcements:

- Please use "COMP 4601" in the subject line of any e-mail.

Course Description:

Introduction to the creation, delivery and analysis of multimedia content in systems with mobile devices. Topics include analysis of webs of documents, social network analysis, recommender systems and problems of trust, reputation and influence in mobile e-commerce systems.

Topics Covered:

1. RESTful applications: architecture, JAX-RS, Jersey
2. Introduction to information retrieval: document structure and similarity
3. Introduction to (social) network science: types of social network structures and their

structural analysis
4. Creation and analysis of webs of documents: web crawlers, pagerank
5. Introduction to social network data analysis: tools and simple data mining techniques
6. Recommender systems
7. Problems in social networks: trust, reputation, influence and community detection
8. Multimedia content: recognition and similarity

Prerequisites:

COMP 2601, or one of COMP 2404, SYSC 3010, SYSC 3110, and COMP 2406

Course Objectives:

Short Description

The principal objective of this course is to provide students with knowledge that will enable them to analyze, design and construct social network systems that create and consume multimedia data.

Long Description

The principal course objective is to have a student create and analyze networks of multimedia resources found in social networks. The motivation for this objective is that social networks have value for two reasons: the relationships manifest through the links between network participants and the content that these individuals create or introduce to the network.

During the course a student can expect to: create a social network, analyze social networks as graphs with particular properties and analyze multimedia documents and content using information retrieval techniques. Furthermore, students will learn to analyze large bodies of information for the purpose of extraction of general properties. Finally, several important problems in mobile information retrieval may be studied; e.g., face recognition, directed advertising and recommendation systems.

In order to achieve the above, numerous open source software packages will be introduced. These may include: JAMA, JGRAPHT, WEKA, OPENCV, CRAWLER4J, LUCENE, MAHOUT, TIKA, TOMCAT and JERSEY.

The course relies on YOU working on content. In order to do this we will use a standards-based architecture for interacting with our systems. While the course does NOT demand that specific clients be used (e.g., Android, iOS or browser), all interactions with our social network systems will use RESTful web services.

In-class Problems:

This class is run as a lab-style course. This means that there are lectures with a small lecture component followed by in-class problem solving. The in-class problems build up to the

assignments. In-class problems are indicated by the **In-class:** sub-bullet associated with a lecture.

Problems set in class have to be DEMONSTRATED to a TA or the professor by end of class 1 week later. The purpose of the demonstration is to allow Prof. White to ask questions regarding understanding of the material and to provide constructive criticism on the solutions. Prof. White will generally be available 10-15 minutes before each class in 4125 HP to mark in-class problems. He will also be available after class for marking and general consultation.

Textbooks (not mandatory):

- FREE Easley and Kleinberg, "Networks, Crowds and Markets" (we use Ch.1-3)
- Jannach et al., "Recommender Systems: An Introduction" (we use Ch. 1-5, 7, 11)
- FREE Manning C.D., Raghavan P., and Schutze H., Introduction to Information Retrieval
- Marmanis H. and Babenko D., Algorithms for the Intelligent Web

- Content is also provided through web links associated with each lecture prefixed by the tag **READING:** or **REVIEW:** or **VIDEO:**
- Software that may be used for in-class problems associated with a lecture is prefixed with the tag: **SOFTWARE:**

Lectures, In-class Problems and Readings:

1. 8th January: Course Overview, Project Presentations and REST
    1. In-class: REST Setup: Jersey, Tomcat and Eclipse
    2. Review: Introduction to XML
    3. Review: JSON
    4. Review: MIME
    5. Review: Remote Procedure Call
    6. Video: Introduction to REST
    7. Video: Introduction to JSON

Assignments:

Laboratory:

Students must provide their own laptops for in-class use.

Software:

Students will be required to use Eclipse, Android Studio and/or Xcode during this course.

Assignment Submission:

There will be 4 assignments in this course which will be available on the course web page and through cuLearn. All assignments are counted towards the final grade.

Marking Scheme:

Assignments (4)	28%
In-class problems	22%
Term test	25%
Final project	25%

Course Web Page:

As well as being announced in class, all important information, such as course news, assignments, TA hours, instructor office hours, will be available on the course web page at http://www.scs.carleton.ca/~arpwhite/courses/4601. It is the student's responsibility to check this web page for new information *regularly*.

Collaboration Policy

Collaborating outside of your team on assignments is strictly disallowed. Your team must complete the work. If you need help, please see a TA or your instructor. Posting assignment solutions on discussion boards before the due date and time is also prohibited.

SCS Computer Accounts

Any student taking an SCS course qualifies to have an SCS account. SCS accounts can be created at the following URL: http://www.scs.carleton.ca/newacct. SCS students can access one of the designated labs for your course. The labs are operational 7 days a week 24 hours per day, please be advised that the building will be closed overnight, Mon. - Fri. 23:00 - 8:00 and on weekends from 17:00 - 8:00. Technical support is available in room HP5161 Monday to Friday from 9:00 until 17:00. All SCS account related information is accessible at the following URL: http://www.scs.carleton.ca/nethelp.

Graduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP, by telephone at 520-2600, ext. 4364 or by email at undergraduate_advisor@scs.carleton.ca. The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and the Writing Tutorial Services.

University Policies

Student Academic Integrity Policy

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Graduate Calendar.

Plagiarism

As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science.

Unauthorized Co-operation or Collaboration

Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.

Academic Accommodations for Students with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Medical Certificate

The following is a link to the official medical certificate accepted by Carleton University for the deferral of final examinations or assignments in courses. To access the form, please go to www.carleton.ca/registrar/forms