
CS 597 – Special Topics: Information Retrieval Syllabus

Instructor:

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Office Hours:

T: 3pm to 4pm, Th: 3pm to 4pm, and by appointment

Class Schedule:

T/Th 4.30pm to 5.45pm - Room: MEC 201

Reference Textbooks:

There is no required textbook for this class. Instead, we will rely on lecture notes and scholarly papers published at reputable CS journals and conferences.

Some books that you can turn to for reference include:

- Modern Information Retrieval, by R. Baeza-Yates and B. Ribeiro-Neto.
- Search Engines: Information Retrieval in Practice, by B. Croft, D. Metzler, and T. Strohman.
- Introduction to Information Retrieval, by C. Mannin, P. Raghavan, and H. Schutze.
- Recommender Systems Handbook, by F. Ricci, L. Rokach, B. Shapira, and P. Kantor.

Course Webpage:

<https://blackboard.boisestate.edu/webapps/login>

Prerequisites:

Admission to the Graduate Program or Instructor's consent

Course Description:

This advanced topics course will explore diverse areas of study related to Information Retrieval (IR). This course will give students an overview of IR and will introduce them to state-of-the-art research and future trends on query suggestion, question answering, recommendation systems, (social) web search, and big data. The course will be centered on paper reading assignments and topic presentations by the instructor and students. In addition, this course will involve students in a variety of activities that often happen in real research communities.

Course Overall Objectives:

- To learn the concepts and terminology of IR systems.
- To study and understand different design methodologies and algorithms used in IR systems.
- To focus on the latest developments related to topics in the IR domain, including, but not limited to, query processing, ranking, question answering, recommendations, and big data.

Course Detailed Objectives:

- Demonstrate understanding of basic concepts and terminology in the IR area.
- Become cognizant of the state-of-the-art methodologies that can be adopted to solve problems within the IR domain related to search, question answering, and recommendation.
- Become aware of the relationship between IR and Big Data.
- Demonstrate ability to identify problems (and the corresponding solutions) within the IR domain.

- To develop and put in practice the skills required to be a researcher: identifying problems, analyzing adequate methodologies to solve problems, presenting papers/topics to an audience, writing reports (e.g., conference papers).
- To integrate, whenever possible, academic study, community service field work, structured reflection, and problem solving activities.

Working Together:

The class is taught in a seminar-like style, following a problem-driven approach. We will focus on application areas and/or challenges of interest. For this reason, the proposed class schedule may evolve throughout the semester. Much of the learning will occur as you prepare for lectures, participate in them, and listen to each other. The latter is of special significance, since learning to make adequate contributions and appreciate those of others will be a skill that you will use throughout your career as a computer scientist. Your reading and class participation will greatly determine how much you get out of the class. You will also have a chance to give presentations and work on a class project of your interest. These activities will prepare you to give/receive feedback in a constructive way and more importantly, will give you experience, in terms of working independently and proactively.

Grading:

- The final grade will be calculated as follows
 - Class presentations: 15%
 - Class participation: 15%
 - Final exam: 15%
 - Project: 55%, distributed as follows:
 - Project proposal presentation 5%
 - Term-paper proposal 10%
 - Pre-proposal and Progress Meetings 5%
 - Presentation of complete research 10%
 - Final paper/SL application and report 25%
- Final grades will be given according to the following scale
 - A: 93-100% A-: 90-92%
 - B+: 87-89% B: 84-86% B-: 80-83%
 - C+: 77-79% C: 74-76% C-: 70-73%
 - D+: 67-69% D: 64-66% D-: 60-63% F: Below 60%

Course Requirement:

- **Class Discussion (or Learning by Thinking):** You are expected to contribute to the discussion related to the topic covered in a given class. In addition, you will have a chance to lead at least one class discussion. This will require a bit more work on your part, but will allow you to think about the topic, synthesize ideas, summarize results and outline future areas of studies. This is a great opportunity to improve your communication skills.
- **Take-home Final Exam (or Learning by Explaining):** The final will be take-home and will give you an opportunity to elaborate in more depth on some of the issues covered during the semester.

- **Project (or Learning by Doing):** You will work on an IR project, based on real data, benchmark datasets, and/or an open applied research problem. This project will span the entire semester, and will give you a great opportunity to work on something you are interested in, get more familiar with IR applications, and show your creativity. You will have a choice regarding the type of project you want to be involved in:
 - Research paper - using the SIGIR format: You will be in charge of problem formulation, literature survey, hypothesis formulation, experimental design, implementation, and possibly submission to a conference like ACM SIGIR or WWW.
 - Software system - develop a working, useful system: You will be responsible for implementing and deploying the solution to an existing real IR problem. A report will also be expected.

If you plan on working on the software development alternative for your class project, you will select a project among the ones requested by non-profit community organizations in our area (we will discuss the different alternatives in class). These type of projects will give you the opportunity to work on a “real-world” environment by dealing with problems that have been identified by non-profit community organizations in our area, which should give you the opportunity to experience:

- The creativity, challenge, and fun of dealing with “real-life” IR issues. In addition, you will be able to demonstrate critical thinking and problem solving skills to identify, analyze, and solve a "real" IR problem.
- The interaction with organizations outside of the university environment, including community agencies, their clients, and industry experts as they work towards completing their project.
- The inspiration, satisfaction and personal rewards of being involved in projects that serve the community. This should provide you with a deeper understanding of the problem you are trying to solve, which should enable you to design a solution that meet the client's or agencies needs.

Note that by being part of a service-learning project, you will have to develop a timeline and manage your project to ensure completion in a timely manner. Furthermore, frequent informal communication with the agency and / or client will be critical throughout the entire process to (i) ensure that you understand the design constraints and (ii) guarantee that the proposed solution will meet the agency's or client's needs.

Students selecting a nonprofit project will gain *Service-Learning* designation on their transcript. “*Service learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities*” (Learn and Serve America National Service Learning Clearinghouse).

Other important information:

- **Academic Honesty.** The University's goal is to foster an intellectual atmosphere that produces educated, literate people. Because cheating and plagiarism are at odds with that goal, those actions shall not be tolerated in any form. Academic dishonesty includes assisting a student to cheat, plagiarize, or commit any act of academic dishonesty.

Plagiarism occurs when a person tries to represent another person's work as his or her own or borrows directly from another person's work without proper documentation. If a student engages in academic dishonesty, the student may be dismissed from the class and may receive a failing grade. Other penalties may include suspension or expulsion from the University. For much more information about academic integrity, including examples of academic dishonesty, see: <http://cs.boisestate.edu/~buff/files/www-integrity.pdf>

- **University Attendance Policy.** Students are expected to attend classes regularly. Missing one of two first classes may result in your automatic withdraw from the class. (See <http://registrar.boisestate.edu/catalogs/gr-online/gr-general-policies.shtml#attendancel>)
- **Disability Office.** Students with disabilities needing accommodations to fully participate in this class should contact the Disability Resource Center (DRC). All accommodations must be approved through the DRC prior to being implemented. For more information, visit the DRC's website <http://drc.boisestate.edu/students/getting-started/>