**Basic Course Information:** CS 5180

Course Title: Information Retrieval

Units: 3

C/S Classification #: C-2

Component (select one): Lecture

Instructional Mode (select all appropriate choices): Face-to-Face and web-assisted

Grading Basis (select one): Graded only

Repeat Basis (select one): May be taken only once

Cross listed Course (if offered with another department): N/A

Dual-listed Course (if offered as lower/upper division or undergraduate/graduate): N/A

Major course/Service course/GE course (select all appropriate choices): Major course

Date Prepared: March 31, 2015

Prepared by: Sukanya Manna

**I Catalog Description**

Theory, design, and implementation of text-based information retrieval systems. Overview of information retrieval system. Statistical characteristics of text, representation of information needs and documents, retrieval models, search evaluation, clustering and classification algorithms. Current issues and technologies in information retrieval development.

**II Required Coursework and Background**

Pre-requisite(s): CS 3310 or consent of instructor.

**III Expected Outcomes**

On successful completion of this course, students will be able to:

1. Gain solid foundation in information retrieval

2. Analyze, identify and design text based retrieval systems

3. Develop skills to solve computational search problems

4. Gain experience in building search engines

Outcomes of this course will build student capacity in each of the following areas as defined by programmatic objectives for the computer science major.

P-SLO 3. An ability to build applications, either individually or in a team, that are robust, reliable, and maintainable.

P-SLO 4. A breadth of advanced knowledge and skills in applied areas of computer science.

**IV Instructional Materials**

*Required:*

* Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schutze, Introduction to Information Retrieval, Cambridge University Press, 2008, ISBN 978 -0-521-86571-5 (free online version available at

http://nlp.stanford.edu/IR-book/pdf/irbookonlinereading.pdf)

*References:*

* Trey Grainger and Timothy Potter, Solr in Action, ISBN: 9781617291029
* Grant S. Ingersoll, Thomas S. Morton, and Andrew L. Farris, Taming Text: How to Find, Organize, and Manipulate It. January, 2013. ISBN: 9781933988382

**V Minimum Student Material**

Course textbooks and lecture handouts

**VI Minimum College Facilities**

A classroom with a projection system and a computer lab with Linux operating systems (with individual network mounted home directory with at least 100MB free space)

**VII Course Outline**

1. Introduction to information retrieval

2. Text representation and indexing

3. Retrieval models

4. Evaluation techniques

5. Clustering

6. Classification

7. Web search and crawling

8. Link Analysis

**VIII Instructional Methods**

Lecture

Problem-solving

Group activities

Project-based learning

Programming projects

**IX Evaluation of Outcomes**

**A. Student Assessment**

i Programming projects (individual and groups)

ii presentation

iii midterm

iv final

v quizzes

vi homework

**B. Meaningful Writing Assignment**

* Students shall produce written solutions or proofs or programs to problems that are assigned as homework and/or programming projects and explain their reasoning.
* Short answer /essay questions on exams (or quizzes) will require students to explain and justify their response in writing.
* Computational methods on exams (or quizzes) will require students to justify their understanding of the theories taught.

**C. A Matrix of Course Student Learning Outcomes vs Methods of Assessment**

If the course is being evaluated for accreditation purposes, approved department accreditation assessment tools will additionally be utilized.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Course Learning Outcomes | Methods of Assessment | | | | | |
| Class Participation | Homework | Programming Projects | Presentation | Quizzes | Exams |
| 1 Gain solid foundation in information retrieval | X | X | X | X | X | X |
| 2 Analyze, identify and design text based retrieval systems | X | X | X | X | X | X |
| 3 Develop skills to solve computational search problems | X | X | X | X | X | X |
| 4 Gain experience in building search engines | X | X | X | X |  |  |