

**The University of Texas at El Paso**  
**Department of Computer Science**  
**CS 4390/5390: Information Retrieval and Information**  
**Visualization**

**Fall 2020 Syllabus**

<b>Time and Location:</b> MW 12:00 PM – 1:20 PM Blackboard – Virtual Class	<b>Instructor:</b> Monika Akbar <b>Email:</b> makbar@utep.edu <b>Phone:</b> 915-747-5883 <b>Office:</b> CCSB 3.0422 <b>Office Hours:</b> MW 2:00 – 3:00 pm or by appointment <b>Office Hours Location:</b> <a href="#">MS Teams</a>
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**Course Objectives:** This is an introductory course in information retrieval (IR) and information visualization. IR covers theory and practice of information systems such as search engines. Topics in IR include models and methods for representing text, indexing, browsing, and various services in information systems such as searching and recommendation. Through this course, students will learn the fundamentals of information retrieval systems.

Students will also gain knowledge on information visualization principles. Students will be introduced to various information visualization techniques enabling them to choose appropriate visualizations for different types data and for different tasks.

**Prerequisite:** None. Although, it is recommended that student has taken Data Structures.

**Book:**

- Introduction to Information Retrieval by Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schütze. 2008, Cambridge University Press, ISBN-10: 0521865719, ISBN-13: 978-0521865715. Available at: <https://nlp.stanford.edu/IR-book/>
- Search Engines: Information Retrieval in Practice. Croft, Metzler and Strohman (Addison-Wesley, 2008). <http://ciir.cs.umass.edu/downloads/SEIRiP.pdf>
- Interactive Data Visualization for the Web by Scott Murray. O'Reilly Media, Inc. Print ISBN-13: 978-1-4919-2128-9. (E-book free through the UTEP library.)
- Reference books:
  - Web information retrieval by Stefano Ceri, Alessandro Bozzon, Marco Brambilla, Emanuele Della Valle, Piero Fraternali, Silvia Quarteroni. Heidelberg. Springer, 2013. (E-book free through the UTEP library.)
  - The Visual Display of Quantitative Information by Edward R Tufte.
- Additional resources will be available in Blackboard.

**Course Website:** Blackboard.

**GRADING**

Grades are communicated to students in a timely manner. It is the students' responsibility to keep track of their grades. Your semester grade will be based on a combination of homework assignments, quizzes, class participation, 2 midterm exams, a final exam, and a project. The approximate percentages are as follows:

- Quiz and in-class participation: 20%
- Homework/assignments: 20%
- Exams: 30%
- Project: 30%

The nominal percentage-score-to-letter-grade conversion is as follows:

- 90% or higher is an A
- 80-89% is a B
- 70-79% is a C
- 60-69% is a D
- Below 60% is an F

**Grade appeals:** Any grades, except the final exam, must be appealed within 7 days of the grade being posted.

### COURSE OUTLINE

**Class Description:** This class will include lectures, in-class activities, state-of-the-art literature surveys, and a semester-long group project. The class will include presentations by the instructor and students, discussions, and demos of various concepts. Students will learn to think critically, communicate effectively, and collaborate productively in a group.

### Tentative Weekly Schedule:

Week	Topic
1	Introduction to Information Retrieval (IR). Introduction to data properties: data architecture, data types and data formats, data modeling and design, linked open data.
2	Introduction to IR tasks: Acquisition (crawling), text pre-processing., indexing (construction and compression), retrieval, query processing.
3	Transformation: Information representation - local and distributed representations, weighted vector-space model.
4	Retrieval models: Probabilistic graphical model, Latent semantic indexing. Retrieval evaluation: Scoring and ranking of search results.
5	Midterm 1
6	IR Applications: Filtering, recommendation, personalization. Introduction to Information Visualization.
7	Design Principles: HCI metrics, scale, tasks, data mapping, overviewing, data density, graphic properties, presentation methods.
8	Visual Encoding: Graphical methods for data presentation, visual perception, graphical perception, layering and separation.
9	Interaction Strategies: Overviews, multiple views, focus + context, filtering and querying, lens, data flow.
10	Midterm 2
11	Introduction to D3 visualization.
12	Applications of visualizations: Explore, transform, visualize large complex datasets including scientific data, tabular data, text data, graphs, and documents.
13	Project presentation
14	Review
15	Final exam

## COURSE DETAILS

**Project:** There will be a semester-long group project for the graduate and undergraduate students. Students are encouraged to form groups of three to four members --- including both graduate and undergraduate students. The instructor will provide a list of potential projects that teams can choose from. A team can create their own project too, with approval from the instructor.

The project must have information retrieval and visualization components. The target of the project is to deliver a publishable report along with the description of the methodology and full experimental results.

**Exams:** There will be 2 midterm exams and one final exam. All three exams together will weigh 30% of your overall final grade. Make-up exams will not be permitted except under unusual circumstances with satisfactory written justification. Any student who misses an exam due to an unexcused absence will receive a grade of zero for that exam with no opportunity for make-up or substitution. University excused absences will be excused; the exam related arrangements should be made in advance in those cases.

**Homework:** Regular homework/assignment will be assigned which will require significant effort outside of class. The assignments are designed to challenge you by requiring that you apply learned concepts to new situations. You should start working on your assignment immediately after receiving it.

**Quizzes and Exercises:** There will be regular quizzes and exercises in the class. The purpose of each quiz and exercise is to ensure that you are staying current with the class content and to verify that you have acquired the skills introduced in the class. The quizzes are not pre-scheduled. There will be **no make-up** on missed quizzes.

**Late Policy:** All assignments are due before the start of class on the day it is due, unless otherwise stated. There will be a 25% penalty for each day after the deadline. No submission will be accepted after the 4<sup>th</sup> day.

**Class Participation:** Students should be **on time** for all scheduled sessions and **attend the entire session**. Attendance at and participation in all lecture sessions are essential for your success in this course. Although attendance has a specific weight, the instructor reserves the right to penalize the final grade for low attendance because active in-class participation is critical in this class. Taking notes on paper is recommended than using digital devices.

## RESOURCES

**Special Accommodations:** If you have a disability and need classroom accommodations, please contact the Center for Accommodations and Support Services (CASS) at 747-5148 or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit [Center for Accommodations and Support Services](#). CASS assists students with ADA-related accommodations for coursework, housing, and internships. CASS' staff are the only individuals who can validate and authorize accommodations for students with disabilities.

**Help Desk:** Please contact UTEP [Help Desk](#) if you are experiencing technological challenges (email, Blackboard, software, etc.), and submit a digital ticket for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

## Individual Resources

- [Military Student Success Center](#): Assists personnel in any branch of service.
- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.

**Scholastic Dishonesty:** Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but not limited to cheating, plagiarism, collusion, submission for credit of any work or materials that are attributable to another person.

**Cheating** is copying from the test paper of another student. Communicating with another student during a test to be taken individually. Giving or seeking aid from another student during a test to be taken individually. Possession and/or use of unauthorized materials during tests (i.e. crib notes, class notes, books, etc.). Substituting for another person to take a test. Falsifying research data, reports, academic work offered for credit.

**Plagiarism** is using someone's work in your assignments without the proper citations. Submitting the same paper or assignment from a different course, without direct permission of instructors.

To avoid plagiarism, see: <https://www.utep.edu/student-affairs/osccr/Files/docs/Avoiding-Plagiarism.pdf>

**Collusion** is unauthorized collaboration with another person in preparing academic assignments.

**NOTE: When in doubt on any of the above, please contact your instructor to check if you are following authorized procedure.**

## VIRTUAL CLASS AND HOW TO BE SUCCESSFUL

### BLACKBOARD COLLABORATE SESSIONS (also known as Virtual Class)

This class requires that you participate in scheduled Blackboard **Virtual Class** sessions. The purpose of these sessions are for you to view live demonstrations of the course material and/or to participate in small discussion groups with your classmates.

Students are expected to, at least occasionally, participate in these sessions with a *webcam and microphone*. The sessions will be recorded and provided so that they can be reviewed by classmates at a later time. **Students should not record the sessions and post them to any sites outside of Blackboard.** If you are unable to attend a Virtual Class, please let me know as soon as possible so that accommodations can be made when appropriate.

### ATTENDANCE AND PARTICIPATION

Attendance in the course is determined by participation in the learning activities of the course. Your participation in the course is important not only for your learning and success but also to create a community of learners. Participation is determined by completion of the following activities:

- Reading/Viewing all course materials to ensure understanding of assignment requirements
- Participating in engaging discussion with your peers on the discussion boards
- Participating in scheduled Blackboard **Virtual Class** sessions
- Other activities as indicated in the class.

Because these activities are designed to contribute to your learning each week, they cannot be made up after their due date has passed.

## **CLASS RECORDINGS**

The use of recordings will enable you to have access to class lectures, group discussions, and so on in the event you miss a synchronous or in-person class meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP's acceptable-use policy. A recording of class sessions will be kept and stored by UTEP, in accordance with FERPA and UTEP policies.

Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. **You may not share recordings outside of this course.** Doing so may result in disciplinary action.

## **COMMUNICATION**

Because this is an virtual class, we won't see each other in the ways you may be accustomed to: during class time, small group meetings, and office hours. However, there are a number of ways we can keep the communication channels open:

- **Office Hours:** We will not be able to meet on campus, but I will still have office hours for your questions and comments about the course. My office hours will be held on [MS Teams](#) during the these times: **Monday and Wednesday: 2:00 - 3:00 p.m.**
- **Email:** When e-mailing us, be sure to email from your UTEP student account and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name, and your university identification number.
- **Discussion Board:** If you have a question that you believe other students may also have, please post it in the discussion boards inside of Blackboard. Please respond to other students' questions if you have a helpful response.
- **Announcements:** Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

## **NETIQUETTE**

As we know, sometimes communication online can be challenging. It's possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider the audience. This is a college-level course; therefore, all communication should reflect polite consideration of other's ideas.
- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the **ideas**, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.