**University of North Carolina at Charlotte**
**DSBA 6188 Text Mining and Information Retrieval**

**Credits:** 3 Credit Hours

**Days, Time/Location:**
5:30 pm - 8:15 pm on Thursdays at Dubois Center (Uptown) 1105

**Course Description:**
The availability of text data has created unprecedented opportunities to leverage computational and statistical approaches to turn data into actionable knowledge. This course covers general techniques for analyzing large amounts of text data as well as basic techniques for information retrieval.

The current technology of natural language processing has not yet reached a point to enable a computer to precisely understand natural language text, but text mining (TM) techniques with a wide range of statistical and heuristic approaches have been developed over the past few decades. They are usually very robust and can be applied to analyze and manage text data in any natural language, and about any topic. This course intends to provide a systematic introduction to many of these approaches, such as word association mining, topic modeling, and text classification. On the other hand, information retrieval (IR) is a relatively mature and well-established field. We will introduce the contemporary retrieval models as well as their evaluations.

We will offer Python code examples which contain implementations of many techniques discussed in this course. Homework exercises are designed based on Python to help students acquire practical skills of experimenting with the learned techniques and applying them to solve real-world application problems.

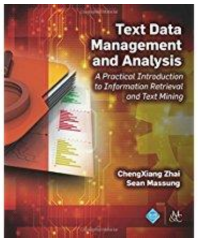
The required background knowledge to take this course is minimal since the it is intended to be mostly self-contained. However, students are expected to have basic knowledge about computer science, particularly some programming language, and be comfortable with some basic concepts in probability and statistics such as conditional probability and parameter estimation.

**Faculty Information**:
Faculty: Dr. Depeng Xu
**Email:** dxu7@charlotte.edu
**Office:** Woodward Hall 333D
**Class Hours:** Thursdays 5:30 pm - 8:15 pm The Dubois Center (Uptown) 1105
**Office Hours:**
Thursdays 4:00 pm - 5:00 pm The Dubois Center (Uptown) 713
In-Person at WWH 333D or Zoom with an appointment outside of office hours
Zoom link: https://charlotte-edu.zoom.us/s/8285295595

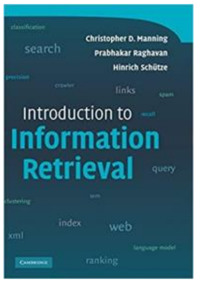
**Teaching Assistant**:
Yaxin Zhao
**Email:** yzhao21@charlotte.edu
**TA Office Hours:**
Thursdays 4:00 pm - 5:00 pm on Zoom
https://charlotte-edu.zoom.us/j/96920845966?pwd=ETAQfpcCDvB6zbbWcO1dBDZ8Pa4cM5.1

## Textbooks

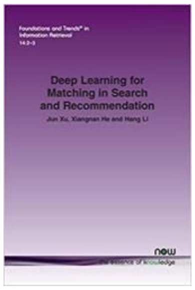
**Title:** Text Data Management and Analytics: A Practical Introduction to Information Retrieval and Text Mining
**Author(s):** ChengXiang Zhai and Sean Massung
**Publisher:** ACM and Morgan & Claypool Publishers
**Year:** 2016


Text Data Management and Analysis
A Practical Introduction to Information Retrieval and Text Mining
ChengXiang Zhai
Sean Massung

**Title:** Introduction to Information Retrieval
**Author(s):** Christopher D. Manning, Prabhakar Raghavan, and Hinrich Schutze
**Publisher:** Cambridge
**Year:** 2008



**Title:** Deep Learning for Matching in Search and Recommendation
**Author(s):** Jun Xu, Xiangnan He, Hang Li
**Publisher:** Now Publishers
**Year:** 2020


Deep Learning for Matching in Search and Recommendation
Jun Xu, Xiangnan He and Hang Li
now

**Evaluation Methods:**
**<u>Course grading will be based on these activities.</u>**

| **Activities** | **Point** |
|---|---|
| In-Class Quizzes | 2 points x 12 = 24 points |
| After-Class Homework | 5 points x 12 = 60 points |
| Term Project | 16 points |
| **Total** | **100 points** |

**Grade Scale:**

A = 90 points – 101 points
B = 80 points – 89 points
C = 70 points – 79 points
U = Below 70 points

**Course Overview:**

| **Contents** |
|---|
| Syllabus<br>Lesson 1: Basic Concepts |
| Lesson 2: Word Association Mining |
| Lesson 3: Topic Modeling I |
| Lesson 4: Topic Modeling II |
| Lesson 5: Text Classification |
| Lesson 6: Retrieval Model I: Boolean Retrieval |
| Lesson 7: Retrieval Model II: Vector Space Model 1 |
| Lesson 8: Retrieval Model II: Vector Space Model 2 |
| Lesson 9: Evaluations in Information Retrieval |
| Lesson 10: Retrieval Model III: Probabilistic Information Retrieval |
| Lesson 11: Retrieval Model IV: Web Search |
| Lesson 12: Overview of Deep Learning |
| Lesson 13: Retrieval Model V: Deep Learning Models for Information Retrieval |

**Course Policies:**

**Course Credit Workload:**

This 3-credit course requires 9-12 hours effort (including the class time) for this course each week for approximately 14 weeks. Efforts may include but is not limited to: required reading, homework assignments, and studying for quizzes.

**Class Attendance Policy:**

Attending every class is mandatory. Class attendance entails being prepared, present, and attentive for the entire class period. Missing class reduces your grade through the following method: Two absences could be excused if you send an email with your explanation BEFORE the beginning of the class. More than two absences (three or above) in total will result in U in the course. For each absence, the student is responsible for catching up with all covered materials and assignments.

**Late Submissions:**

For assignments, unexcused late submission (according to the Canvas timestamp and the "late" flag) will receive a grade of 0. You should plan sufficiently for completing and submitting assignments. Should an emergency arise that greatly disrupts one's ability to complete an assignment, please send an email to Dr. Xu before the due date with a plan for submission after the due date. You need to receive Dr. Xu's permission for late submission.

**Special Needs and Religious Accommodation:**

If you have a documented disability and require accommodation in this course, contact the Office of Disability Services (https://ds.uncc.edu/students/academic) the first week of the semester. Accommodations for learning will be arranged by that office and communicated to the Instructor.

It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a Request for Religious Accommodation Form to their instructor prior to the census date for enrollment for a given semester. The census date for each semester (typically the tenth day of instruction) can be found in UNC Charlotte's Academic Calendar (https://registrar.uncc.edu/printable-calendar).

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https://legal.uncc.edu/policies/up-502
**Standard for Responsible Use:** https://oneit.uncc.edu/iso/standard-responsible-use