

Syllabus

Course Objective

Provide a comprehensive overview of the fundamental concepts and techniques of data mining.

- Be able to understand the key concepts of data mining techniques, including data preprocessing, data warehousing and cube, frequent pattern mining, classification, and clustering.
- Be able to apply the key data mining techniques to a realistic setting, evaluate and analyze

the mining results.

Basic Information

Classes: **Tue, Thu 11:00 am – 12:15 am**

Location: **1320 Digital Computer Laboratory**

Instructor: Ruby Tahboub, [rubyt@illinois.edu \(mailto:rubyt@illinois.edu\)](mailto:rubyt@illinois.edu)

TAs:

- He, Xinyu, [xhe34@illinois.edu \(mailto:rd22@illinois.edu\)](mailto:xhe34@illinois.edu)
- Sayar Ghosh Roy, [sayar3@illinois.edu \(mailto:sayar3@illinois.edu\)](mailto:sayar3@illinois.edu)
- Kowshika Sarker, [ksarker2@illinois.edu \(mailto:ksarker2@illinois.edu\)](mailto:ksarker2@illinois.edu)

Office hours: By instructor/TA,

- Ruby Tahboub: TBA
- He, Xinyu: TBA
- Sayar Ghosh Roy: Thu 1:00 pm - 2:00 pm, Fri 12:00 pm - 1:00 pm
- Kowshika Sarker: Mon 4:00 pm - 5:00 pm, Fri 9:00 - 10:00 am

Office hours: By day of the week

- Mon: TBA
- Tue: TBA
- Wed: TBA
- Thu: TBA
- Fri: TBA

Online resources:

- Canvas
- CampusWire
- Gradescope

Schedule (Tentative, subject to mild adjustments)

- Course Outline / Chapter 1: Introduction (week 1)
- Chapter 2: Data and Measurements (weeks 1, 2, 3, 4)
- Chapter 6: Classification: Basic Concepts (weeks 5, 6, 7, 8)
- Chapter 7: Classification: Advanced Concepts (week 8, 9)
- Chapter 10: Deep Learning (weeks 9, 10)
- Chapter 8: Cluster Analysis: Basic Concepts (weeks 11, 12)
- Chapter 4: Mining Frequent Patterns, Associations, and Correlations (weeks 12, 13)
- Chapter 5: Advanced Pattern Mining (weeks 13, 15, 16)

Coursework and Grading

- Assignments, Programming Assignments, and Exams
 - Five Assignments(three written and two programming)
 - Three Exams: (Take-home)

The lowest grade (assignment or exam) will be dropped. Hence, each assessment is roughly worth **14.285%**, i.e., (100/7)

However, receiving a Zero in assessment due to academic dishonesty **WILL NOT BE DROPPED**

- For students taking 4th credit
 - Project proposal: 15%
 - Mid-term report: 35%
 - Final report: 50%
 - For students registering 4 credits: 25%. The overall scores will be scaled proportionally
 - Group project: 3 members

Key Dates

- **Assignments**
 - A1: out on **Thu 2/1**, due on **Wed 2/14**
 - A2: out on **Thu 2/22** due on **Fri 3/8**
 - A3 out on **Tue 3/19** due on **Mon 4/8**
 - A4: out on **Tue 4/9** due on **4/22**
 - A5: out on **Tue 4/16** due on **4/29**
- **Exams**
 - Exam 1, **Thu 2/15**, posted 6 pm, 24 hours
 - Exam 2, **Thu 3/28**, posted 6 pm, 24 hours
 - Exam 3, **Tue 4/30**, posted 6 pm, 24 hours
- **Project (for students taking 4th credit)**
 - Project team due on **Fri 2/2**
 - Project proposal (1-page+refs) due on **Mon 2/26**
 - Mid-term report (3-page+refs+appendix) due on **Mon 4/1**
 - Final report due (6-page+refs+appendix) due on **Wed 5/1**

Grades

- The following cutoffs represent what will likely be used to generate letter grades:

A+ $\geq 98\%$	A $\geq 94\% \ \& \ < 98\%$	A- $\geq 90\% \ \& \ < 94\%$
B+ $\geq 85\% \ \& \ < 90\%$	B $\geq 80\% \ \& \ < 85\%$	B- $\geq 77\% \ \& \ < 80\%$
C+ $\geq 74\% \ \& \ < 77\%$	C $\geq 70\% \ \& \ < 74\%$	C- $\geq 67\% \ \& \ < 70\%$
D $\geq 60\% \ \& \ < 67\%$	F $< 60\%$	

- The above cutoffs are tentative and may be adjusted slightly; if there is any adjustment to the above cutoffs, we will NOT curve down your letter grades
- However, there will be no general curve-fitting in assigning the final grades

Textbooks

Required: Jiawei Han, Jian Pei, and Hanghang Tong, Data Mining: Concepts and Techniques (4rd ed), Morgan Kaufmann, 2023

References:

- Charu C. Aggarwal, Data Mining: The Textbook, Springer, 2015
- P.-N. Tan, M. Steinbach and V. Kumar, Introduction to Data Mining, Wiley, 2005 (2nd ed. 2016)
- Mohammed J. Zaki and Wagner Meira Jr., Data Mining and Analysis: Fundamental Concepts and Algorithms, Cambridge University Press, 2014

Mental Health

Diminished mental health, including significant stress, mood changes, excessive worry, substance/alcohol abuse, or problems with eating and/or sleeping, can interfere with optimal academic performance, social development, and emotional well-being. The University of Illinois offers various confidential services, including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings at no additional cost. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do -- for yourself and for those who care about you.

Counseling Center: 217-333-3704, 610 East John Street, Champaign, IL 61820

McKinley Health Center: 217-333-2700, 1109 South Lincoln Avenue, Urbana, Illinois 61801

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality can be found here: <http://wecare.illinois.edu/resources/students/#confidential>
(<http://wecare.illinois.edu/resources/students/#confidential>)

Other information about resources and reporting is available here: <http://wecare.illinois.edu>
(<http://wecare.illinois.edu>)

Academic Integrity

The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/> (<http://studentcode.illinois.edu/>)

Academic dishonesty may result in a failing grade. Every student must review and abide by the Academic Integrity Policy: <https://studentcode.illinois.edu/article1/part4/1-401/>
(<https://studentcode.illinois.edu/article1/part4/1-401/>). Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Religious Observances

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus at the beginning of the semester for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should notify your instructor of the conflict and follow the procedure at

<https://odos.illinois.edu/community-ofcare/resources/students/religious-observances/>
(<https://odos.illinois.edu/community-ofcare/resources/students/religious-observances/>)

to request appropriate accommodations. This should be done in the first two weeks of classes.

Disability-Related Accommodations

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, email [disability@illinois.edu \(mailto:disability@illinois.edu\)](mailto:disability@illinois.edu) or go to [https://www.disability.illinois.edu \(https://www.disability.illinois.edu\)](https://www.disability.illinois.edu). If you are concerned you have a disability-related condition that is impacting your academic progress; there are academic screening appointments available that can help diagnose a previously undiagnosed disability. You may access these by visiting the DRES website and selecting "Request an Academic Screening" at the bottom of the page.

Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to the Family Educational Rights and Privacy Act (FERPA) should self-identify with the instructor to ensure the protection of the privacy of their attendance in this course. See [https://registrar.illinois.edu/academic-records/ferpa/ \(https://registrar.illinois.edu/academic-records/ferpa/\)](https://registrar.illinois.edu/academic-records/ferpa/) for more information on FERPA.