



Course Syllabus: Computational Methods in Data Mining - CS 340

Division	Computer, Electrical and Mathematical Sciences & Engineering
Course Number	CS 340
Course Title	Computational Methods in Data Mining
Academic Semester	Fall
Academic Year	2018/2019
Semester Start Date	08/26/2018
Semester End Date	12/11/2018
Class Schedule (Days & Time)	10:30 AM - 12:00 PM Sun Tue

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Xiangliang Zhang	Xiangliang.Zhang@kaust.edu.sa	+966128080313	4413, 1, Al-Khawarizmi (bldg. 1)	

Teaching Assistant(s)

Name	Email
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Course Information

Comprehensive Course Description	Focus is on both classical and new emerging techniques in data mining. Topics include computational methods in supervised and unsupervised learning, association mining, collaborative filtering and graph mining. Individual research project is required. The project is to solve real data mining problems (in text mining), by using what you learned from the course.
Course Description from Program Guide	Focus is on very large-scale data mining. Topics include computational methods in supervised and unsupervised learning, association mining and collaborative filtering. Individual or group applications oriented programming project. 1 unit without project; 3 units requires final project.
Goals and Objectives	Students will master both classical and new emerging techniques in data mining, such as methods in supervised and unsupervised learning, association mining, collaborative filtering and graph mining.
Required Knowledge	Probability and Statistics, Linear Algebra, Data Analytics, Programming skills (C/C++, Java, python, etc, more than Matlab)
Reference Texts	<ol style="list-style-type: none"> 1. Data Mining: Concepts and Techniques. Jiawei Han, Micheline Kamber and Jian Pei. 2. Introduction to Data Mining. Pang-Ning Tan, Michael Steinbach, and Vipin Kumar.
Method of evaluation	30.00% - Homework /Assignments 70.00% - Course Project(s)
Nature of the assignments	The homework will be assigned after the conclusion of a specific topic (see the homework assignment and due date at the course webpage). The project is a very important part in CS 340. Publishable work will be expected. The project missions will include five stages. Each student should work on the assigned problem independently, by proposing their own solutions. Each student then presents their results at the end of each stage at the class, and will be evaluated by the instructor and all other students at the class.

Course Policies	<p>All homework must be handed in before due date. If you submit the homework after the due date, your homework will be graded for correctness, but not credited. Each homework has 100 pts. The final homework score will be the average taking on all assigned homework.</p> <p>The project at each stage will be evaluated by: Technical quality (30) + significance (30) + novelty/impact (20) + report/ presentation (20)</p> <p>Each student must attend every class. A leave of absence must be applied for in advance by sending an email to the instructor.</p>
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Sun 08/26/2018 Tue 08/28/2018	Introduction, Association Rules
2	Sun 09/02/2018 Tue 09/04/2018	Text Processing, Project Presentation of stage 1
3	Sun 09/09/2018 Tue 09/11/2018	Clustering
4	Sun 09/16/2018 Tue 09/18/2018	Project Presentation of stage 2, topic modeling
5	Sun 09/23/2018 Tue 09/25/2018	topic modeling, word embedding
6	Sun 09/30/2018 Tue 10/02/2018	classification
7	Sun 10/07/2018 Tue 10/09/2018	classification, regression
8	Sun 10/14/2018 Tue 10/16/2018	Project Presentation of stage 3
9	Sun 10/21/2018 Tue 10/23/2018	PageRank
10	Sun 10/28/2018 Tue 10/30/2018	Graph embedding
11	Sun 11/04/2018 Tue 11/06/2018	Graph mining
12	Sun 11/11/2018 Tue 11/13/2018	Link prediction
13	Sun 11/18/2018 Tue 11/20/2018	Project Presentation of stage 4
14	Sun 11/25/2018 Tue 11/27/2018	Recommendation System
15	Sun 12/02/2018 Tue 12/04/2018	Large-scale data mining
16	Sun 12/09/2018 Tue 12/11/2018	Final Project Presentation
17		
18		

Note

The instructor reserves the right to make changes to this syllabus as necessary.