Instructor: Dr. Ching-yu (Austin) Huang
Email: chuang@kean.edu   **Website**: http://www.kean.edu/~chuang
Office Hours: https://huang.youcanbook.me/ Tuesday - Thursday: 9:30 – 10:30 am; 3:30 – 4:30 pm
Class: Monday, Wednesday (11:00 - 12:15), synchronized ONLINE using Blackboard Live Session
Prerequisites: **CPS 5740 or CPS 3740. Students without prerequisite(s) must withdraw from the class**.

Unit	Date		Topic	Reading	Assignment	
	1/18/21	Mon	Martin Luther King Holiday		School closed	
1	1/20/21	Wed	Overview		HW 1 start	1
	1/25/21	Mon	Introduction, projects	Ch 1	Research start	2
2	1/27/21	Wed	Correlation, visualization	Ch 1		3
	2/1/21	Mon	Getting to know your data, SQL	Ch 2		4
3	2/3/21	Wed	SQL, aggregation and report, similarity	Ch 2		5
	2/8/21	Mon	Data Processing - text and image	Ch 3		6
4	2/10/21	Wed	Continue, review for midterm #1	Ch 3		7
	2/15/21	Mon	President Day Holiday		School closed	
	2/17/21	Wed	Midterm #1		HW 1 due	8
5	2/22/21	Mon	Database vs Data Warehouse	Ch 4	HW2 start	9
	2/24/21	Wed	Data Warehouse and OLAP	Ch 4		10
6	3/1/21	Mon	Associations and Correlations			11
	3/3/21	Wed	Mining Frequent Pattern	Ch 6		12
7	3/8/21	Mon	Basic concepts of Image classification			13
	3/10/21	Wed	Image classification - Google TensorFlow		HW 2 due	14
8	3/15/21	Mon	Text mining and text similarity	Ch 8	HW 3 start	15
	3/17/21	Wed	Search engine and Web crawling	Ch 8		16
9	3/22/21	Mon	Classification: impurity, gain, decision tree	Ch 9		17
	3/24/21	Wed	Classification: Linear regression and SVM, review midterm 2	Ch 9		18
10	3/29/21	Mon	SNP clustering and cluster analysis			19
	3/31/21	Wed	Midterm 2		Midterm 2	20
	4/1/21	Thur	Last day to withdraw with 'W' grade		0% refund	
	4/5/21	Mon	School wellness day		No class	
11	4/7/21	Wed	Review midterm 2 answers, K-Means	Ch 10		21
	4/12/21	Mon	Hierarchical cluster analysis	Ch 10		22
12	4/14/21	Wed	Outlier detection	Ch 12		23
	4/19/21	Mon	Continue outlier Detection	Ch 12		24
13	4/21/21	Wed	Data mining trends and impacts	Ch 13	HW 3 due	25
	4/26/21	Mon	Research presentation			26, 27
14	4/28/21	Wed	Kean Research Days – case study Review for Final		Monday schedule	28
	5/3/21	Mon	Final exam			29
15	5/5/21	Wed	Review final exam answers			30

Late revision: 3/29/2021

CPS 4721-01/5721-01   Data Mining Principles   Dr. Huang

- **Course Description:** This course provides the basic principles, methods, and applications of data mining. Students will gain a knowledge of how data mining techniques work, how they can be applied across different domains by using data mining methods in real world and impacts on society.
- **Textbook**: <u>Data Mining: Concepts and Techniques</u>, Third Edition by Jiawei Han, Micheline Kamber and Jian Pei, 2012. **ISBN: 978-0-12-381479-1**.
- **Objectives**: Upon completion of this course, students will be able to:
  - A. Demonstrate an understanding of what data mining is   B. Summarize the social impact of data mining
  - C. Illustrate the differences between data mining and information access/retrieval
  - D. Analyze data mining processes, concepts, techniques and methods   E. Understand data mining applications
- **Course Grading**: **2** Midterms (2x160 pts), **1** Final (180 pts), **3** Homework (3x100 pts), **1** Research and presentation (200 pts)

Class Policies:

- **This is a hands-on course. Students are required to bring personal laptop every class.**
- Instructional Methods: lecture with slides, student presentations, class discussions and exercises, and project creations.
- **A**: >=940, **A-**: 939-890, **B+**: 889-840, **B**: 839-800, **B-**: 799-760, **C+**: 759-720, **C**: 719-680, **D**: 679-640, **F**: below 640
  (C or better is needed for CS and IT majors. B- or better is needed for CIS Graduate Program.)
- It is students' responsibilities to verify all the scores posted on **the class website** that is announced on the first day of the class.
- **Assignments should be used MySQL connecting through a Linux server that is announced on the first day of the class.**
- Mid-Term Progress information will be provided to students by the instructor via KeanWise.
- <u>No late work</u> will be accepted without permission in advance from the instructor. Late work is penalized.
- <u>No make-up exams</u> are provided without documentation of medical or family emergency. Please arrange your schedule for the next 16 weeks to arrive in class on time and prepared.
- Attendance and participation are required.
- <u>All work turned in under your name must be your own</u>. **No credit will be given for an assignment or homework that is copied – in part or in total – from another person**.
- Exam policy: During class examinations, if a student leaves the classroom for any reason during the exam time, **the exam must be turned in before the student departs, concluding the exam for that student**. The student cannot resume the exam on return later. You may not make or take a phone call, text or access the internet during class or a test.
- **Classes may not be audio or digitally captured**, unless permission has been granted by the instructor for that specific class.
- **Public posting of course materials from this class is prohibited**. Materials presented in the classroom are for the personal use of registered students during the semester only. Homework, programs, and other classwork should not be shared, distributed or publicized in any way, for the protection of other students and in respect of the intellectual property rights of the faculty and copyright owners.

Important University Policies and Information:

- The Kean Academic **Calendar** can be found online at https://www.kean.edu/offices/registrars-office/academic-calendar
- **Tutoring and learning Support services**: http://www.kean.edu/content/tutoring-services
- Students should review the **Student Code of Conduct**, as it discusses expectations of appropriate conduct in the classroom: https://www.kean.edu/KU/Code-of-Conduct
- Students are responsible to review and understand the University Academic Integrity Policy available via the following link: https://www.kean.edu/academic-integrity
- Read Kean **Students Rights and Responsibilities** at https://www.kean.edu/offices/disability-services/rights-and-responsibilities
- Register for the university's **emergency notification system** at https://www.kean.edu/offices/university-police-0/campus-alert
- Students must have a **valid Kean email account**. You can request one at https://www.kean.edu/~ocisweb/forms.htm
- **Academic Early Alert information** will be provided to students by the instructor via KeanWise. Please see the 2020-2021 Undergraduate or Graduate Catalog for more information
- **Title IX**: Title IX of the Education Amendments of 1972 (Title IX) prohibit discrimination on the basis of sex in education programs or activities. Sexual harassment in any form will not be tolerated at Kean University. Sexual harassment by students should be reported to the Office of Affirmative Action Programs, Office of the Vice President for Student Affairs or the Office of Community Standards and Student Conduct immediately. Information about the University's Sexual Misconduct Policy may be found at the following: https://www.kean.edu/offices/policies/sexual-misconduct-policy
- **Americans with Disabilities Statement:**
  Kean University is an affirmative action, equal opportunity institution. Students with documented disabilities who may need special instructional accommodations or who may need special arrangements in the event of an evacuation should notify the instructor as soon as possible, no later than the second week of the term. Students may contact the Office of Disability Services in Downs Hall Room 122 or call 908-737-4910 to discuss special needs.
- **Diversity & Non-Discrimination Statement:**
  Kean University is committed to establishing and maintaining a diverse campus community through inclusive excellence and equal opportunity. Kean's commitment to access and equity is designed to prepare each graduate to not only thrive but climb higher in a diverse world. As an affirmative action, equal opportunity institution we work to support a campus-wide agenda to foster a community that both values and promotes the diversity and equity of all students, faculty, staff, administrators, and beyond. Kean adheres to the New Jersey State Policy Prohibiting Discrimination in the Workplace; for more information on Kean's non-discrimination policy and procedures, and protected categories under the policy, please visit: https://www.kean.edu/offices/affirmative-action.

Syllabus Updates: **Instructor reserve the right to change the syllabus at any time throughout the semester**. All changes will be announced in class and a new syllabus will be electronically available to all students. If you are enrolled in this class past the add/drop date you are subjected to all rules in this syllabus.