**Instructor**: Dr. Ching-yu (Austin) Huang          **Website**: http://austinhuang.net/
**Email**: chuang@kean.edu
**Office Hours**: https://huang.youcanbook.me/     Tue, Thur: 10:00–11:00 am; Mon, Tue, Thur: 12:30 – 1:30 pm
**Class**: **Tue**, **Thur** (**14:00 - 15:15 pm**), **location: GLAB 405**
**Prerequisites**: **Admission to CIS Graduate Program**    Students without prerequisite(s) must withdraw from the class.

| WK | Date | | Topic | Reading | Notes | Set |
|----|------|------|-------|---------|-------|-----|
| 1 | 9/1/22 | Thur | Intro of DB, 3-tier arch., setup env., PHP, Linux | E&N: Ch 1 | Test eve, DB acct | 1 |
| 2 | 9/6/22 | Tue | SQL DML select, create view, table, **HW 1** | E&N: Ch 2, 6 | **Start HW1** | 2 |
| | 9/8/22 | Thur | Client-server, web DB app, basic SQL, PHP | E&N: 11, PHP: 9,11 | **Start P1** | 3 |
| 3 | 9/13/22 | Tue | Basic SQL, authentication, PHP MySQL, **P 1** | E&N: 6,30, PHP MySQL | | 4 |
| | 9/15/22 | Thur | Logical design & ER model, **Quiz 1** | E&N: Ch 3 | **Quiz 1** | 5 |
| 4 | 9/20/22 | Tue | Relational model, case study & constraints, **Team** | E&N: Ch 5 | **Start Team** | 6 |
| | 9/22/22 | Thur | DDL - create, DML- insert, update, delete & PHP | E&N: Ch 6, PHP MySQL | | 7 |
| 5 | 9/27/22 | Tue | FK, change, cascade, alter, workbench | E&N: Ch 7 | | 8 |
| | 9/29/22 | Thur | Complex SQL Queries, set, subquery | E&N: Ch 7 | | 9 |
| 6 | 10/4/22 | Tue | View, updatable & materialized views, **Quiz 2** | E&N: Ch 7 | **Quiz 2** | 10 |
| | 10/6/22 | Thur | Relational algebra, relational calculus & SQL | E&N: Ch 8 | **HW1 due** | 11 |
| 7 | 10/11/22 | Tue | SQL variables, SQL programming (PL/SQL) | E&N: Ch 10 | **Start P 2** | 12 |
| | 10/13/22 | Thur | SQL stored routines (PL/SQL) | E&N: Ch 10 | **P1 due** | 13 |
| 8 | 10/18/22 | Tue | SQL error handling, SQL Triggers | E&N: Ch 10 | **Start HW 2** | 14 |
| | 10/20/22 | Thur | Personalization, SQL injection, image, **Quiz 3** | | **Quiz 3** | 15 |
| 9 | 10/25/22 | Tue | Pass, receive & update multiple web items, P2 | PHP: 16, 17, 23 | | 16 |
| | 10/27/22 | Thur | ERD to tables, functional dependencies | E&N: Ch 9, 14 | | 17 |
| 10 | 11/1/22 | Tue | Normalization | E&N: Ch 14 | | 18 |
| | 11/3/22 | Thur | Transactions, **Quiz 4** | E&N: Ch 20 | | 19 |
| 11 | 11/8/22 | Tue | **Election** | | **School closed** | |
| | 11/10/22 | Thur | Concurrency control | E&N: Ch 21 | **Quiz 4** | 20 |
| | 11/11/22 | Fri | **Last day to withdraw with 'W' grade** | | **0% refund** | |
| 12 | 11/15/22 | Tue | Emerging DB – DV, GIS, Google Charts, **P2** | E&N: Ch 24 | | 21 |
| | 11/17/22 | Thur | Emerging DB app – JSON & NoSQL | E&N: Ch 24 | | 22 |
| 13 | 11/22/22 | Tue | Data mining concepts, data warehousing, OLAP, and data visualization | E&N: Ch 28, 29 | **HW2 due** | 23 |
| | 11/24/22 | Thur | **Thanksgiving** | | **School closed** | |
| 14 | 11/29/22 | Tue | Filesystem, database storage, **Team study report** | E&N: Ch 16 | **Team report due** | 24 |
| | 12/1/22 | Thur | RAID, Indexing, query processing, XAMPP | E&N: Ch 17,18, XAMPP | | 25 |
| 15 | 12/6/22 | Tue | Query optimization, SQL performance tuning | E&N: Ch 19 | **P2 due** | 26 |
| | 12/8/22 | Thur | XAMPP, DB admin, DCL | E&N: Ch 30 | | 27 |
| 16 | 12/13/22 | Tue | DB Integrity & security, final exam coverage | E&N: Ch 30 | | 28 |
| | 12/15/22 | Thur | **Final exam** | | **Final exam** | 29 |
| 17 | 12/20/22 | Tue | Review final exam answers | | | 30 |

**Late revision: 8/28/2022.** **For important dates, please consult the Academic Calendar via the following link:**
https://www.kean.edu/offices/registrars-office/academic-calendar

**Content**: Enterprise database management systems; database design; database implementation;      storage and indexing; transaction processing concepts; data warehousing, data mining and online analytical processing (OLAP); emerging database applications.

<u>Course Student Learning Outcomes:</u>  Upon completion of this course, the student will be able to:

A. Measure the role of databases in enterprise information systems. Compare and summarize diverse database models.
B. Design and build web-based applications using database management systems.
C. Explain the role of a database in data mining and OLAP.
D. Write and execute SQL statements and implement PL/SQL programs. Illustrate transaction processing concepts.
E. Summarize the emerging database applications.

## **Instructional Method**

* Slides, assignments, and tool info will be posted on the class google drive that will be sent by the instructor.
* For more information about this course and for course materials, go to http://blackboard.kean.edu
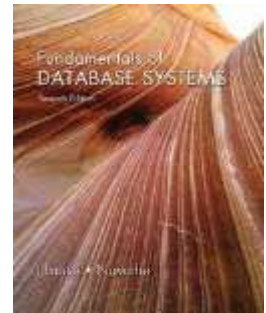
<u>Textbook & Materials</u>
<u>Fundamentals of Database Systems</u> (7th Edition),
Author: Elmasri, R. and Navathe, S.,
Publisher: *Pearson*, 2015.
ISBN-13: 9780133970777

<u>Require hardware and Software</u>
  This is a hands-on course. Students are required to bring a personal laptop to every class.
  Database related free software: MySQL Workbench, XAMPP, MySQL
  Other free software: Putty.exe (Win), terminal (Mac), FileZilla, Sublime
  An account on a Linux server will be provided by the instructor.

<u>Open Educational Resources</u>
For more information, please see the Nancy Thompson Library Learning Commons:
http://libguides.kean.edu/OER

<u>Assessment and course grading</u>
The course includes Exams, Labs, Homework and Project, a **total of 1000 points**.
  Exams: 4 Quizzes (4x70 pts), final (200 pts),
  Team research (80 pts),
  2 Homework (80, 100 pts),
  2 projects (100, 160 pts)

<u>Grading Policy</u>
        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

B- or better is needed for CIS Graduate program.

<u>Technical Requirements:</u>
1. In order for your Blackboard course to function correctly, you will need to disable pop-ups on your Internet browser.
2. Make sure you have Microsoft Office installed on your computer. You may be eligible for a free MS Office Software Student Edition. You are required to create an account and provide a valid Kean University ID to obtain access to the software applications. To start the application process, go to the <u>Office 365 Education website</u>.

<u>Academic Early Alert</u> information will be provided to students by the instructor via KeanWise. Please see the 2020-2021 Undergraduate or Graduate Catalog for more information.
⬚
<u>Class Policies:</u>

<u>Posting of course materials</u>: <span style="color:red">Public posting of course materials from this class is prohibited.</span> Materials presented in the class 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. Kean University's Academic
⬚ Integrity Policy can be found here: https://www.kean.edu/media/academic-integrity-policy.

<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.

<u>Attendance</u> and participation are required.
⬚ <u>All work turned in under your name must be your own</u>. <span style="color:red">No credit will be given for an assignment or homework that is copied – in part or in total – from another person</span>.

<u>Exam policy</u>: During class examinations, if a student leaves the classroom for any reason during the exam time, <span style="color:red">the</span>
⬚ <span style="color:red">exam must be turned in before the student departs, concluding the exam for that student</span>. 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. <span style="color:red">Classes may not be audio or digitally captured</span>, unless permission has been granted by the instructor for that specific class.

<u>For remote learning only - Class Recordings (Live Sessions/Collaborate)</u>
In this class software may be used to record live class discussions. As a student in this class, your participation in live class discussions will be recorded. These recordings will be made available only to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. All recordings will become unavailable to students in the class when the course is closed.

Students are not permitted to record (or download) the course experience. If a recording of the course is required for accommodation purposes students must make those arrangements with the Office of Accessibility Services. Students found to have recorded (or downloaded) course experiences without authorization are subject to review by the Office of Student Conduct and Community Standards.

<u>Privacy Statement</u>
 **Assuring privacy among faculty and students engaged in online instructional activities helps promote open and robust conversations and mitigates concerns that comments made within the context of the class will be shared beyond the classroom. As such, recordings of instructional activities occurring in online classes**

CPS 5740                                Database Systems

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## Ιμπορταντ Υνιϖερσιτψ Πολιχιεσ ανδ Ινφορματιον

Αλλ στυδεντσ ανδ φαχυλτψ σηουλδ φαμιλιαριζε τηεμσελϖεσ ωιτη τηε **Χουγαρ Ρεσταρτ Γυιδε** ωηιχη ινχ

&#9647; λυδεσ ιμπορταντ ϖιρτυαλ ρεσουρχεσ φορ στυδεντσ βψ Κεαν Υνιϖερσιτψ ϖια τηε φολλοωινγ λινκ: ηττπσ://ωωω.κεαν.εδυ/χοροναϖιρυσ−ινφορματιον/ρεσουρχεσ−χυρρεντ−προσπεχτιϖε−στυδεντσ

&#9647; Στυδεντσ αρε ρεσπονσιβλε το&#9647;ρεϖιεω ανδ υνδερστανδ&#9647;τηε *Υνιϖερσιτψ Αχαδεμιχ Ιντεγριτψ Πολιχψ* αϖ αιλαβλε ϖια τηε φολλοωινγ λινκ:&#9647; ηττπσ://ωωω.κεαν.εδυ/αχαδεμιχ−ιντεγριτψ

*Ινστρυχτορσ μυστ ινδιχατε ον τηε σψλλαβυσ ανδ/ορ ινδιϖιδυαλ ασσιγνμεντ ιφ τηε υσε οφ Κεαν Υνιϖερ*

&#9647; *σιτψ αχαδεμιχ συππορτ σερϖιχεσ (Τυτορινγ ανδ/ορ Ωριτινγ* *Χεντερ) ισ περμιττεδ φορ τακε ηομε ασσιγνμεντσ/εξαμσ.*

Στυδεντσ σηουλδ ρεϖιεω τηε *Στυδεντ Χοδε οφ Χονδυχτ*, ασ ιτ δισχυσσεσ εξπεχτατιονσ οφ αππροπριατε

&#9647; χονδυχτ ιν τηε χλασσροομ:&#9647;&#9647; ηττπσ://ωωω.κεαν.εδυ/οφφιχεσ/χομμυνιτψ−στανδαρδσ−ανδ−στυδεντ−χονδυχτ/στυδεντ−χοδε−χονδυχτ

Στυδεντσ αρε στρονγλψ ενχουραγεδ το ρεγιστερ φορ τηε Υνιϖερσιτψϫσ εμεργενχψ νοτιφιχατιον σψστεμ ( ηττπ://ωωω.κεαν.εδυ/χαμπυσαλερτ) ιν ορδερ το βε ινφορμεδ οφ χαμπυσ εμεργενχιεσ, ωεατηερ νοτιχεσ, αν

&#9647; δ οτηερ αννουνχεμεντσ.&#9647; Κεαν Οχεαν στυδεντσ ωουλδ σιγν υπ ϖια τηε φολλοωινγ λινκ:&#9647; ηττπσ://οχεαν.σενδωορδνοω.χομ/ΛιχενσεΠαγε.ασπξ&#9647;

Αλλ στυδεντσ μυστ ηαϖε α ϖαλιδ Κεαν εμαιλ αχχουντ.&#9647; Φορ τηοσε ωηο δο νοτ αλρεαδψ ηαϖε ονε, φορ μσ αρε αϖαιλαβλε ον−λινε ατ ηττπσ://ωωω.κεαν.εδυ/οφφιχεσ/χομπυτερ−ανδ−ινφορματιον− σερϖιχεσ/οχισ−φορμσ&#9647;&#9647;&#9647;&#9647;&#9647;&#9647;&#9647;&#9647;&#9647;&#9647;&#9647;

χλιχκ ον Ε−μαιλ Αχχουντ Ρεθυεστ Φορμ.

## Διϖερσιτψ & Νον−Δισχριμινατιον Στατεμεντ

Κεαν Υνιϖερσιτψ ισ χομμιττεδ το εσταβλισηινγ ανδ μαινταινινγ α διϖερσε χαμπυσ χομμυνιτψ τηρουγ η ινχλυσιϖε εξχελλενχε ανδ εθυαλ οππορτυνιτψ. Κεαν&#9647;σ χομμιτμεντ το αχχεσσ ανδ εθυιτψ ισ δεσιγνε δ το πρεπαρε εαχη γραδυατε το νοτ ονλψ τηριϖε, βυτ χλιμβ ηιγηερ ιν α διϖερσε ωορλδ. Ασ αν αφφιρμα τιϖε αχτιον, εθυαλ οππορτυνιτψ ινστιτυτιον ωε ωορκ το συππορτ α χαμπυσ−ωιδε αγενδα το φοστερ α χ ομμυνιτψ τηατ βοτη ϖαλυεσ ανδ προμοτεσ τηε διϖερσιτψ ανδ εθυιτψ οφ αλλ στυδεντσ, φαχυλτψ, σταφ φ, αδμινιστρατορσ, ανδ βεψονδ. Κεαν αδηερεσ το τηε *Νεω ϑερσεψ Στατε Πολιχψ Προηιβιτινγ Δισχριμι* *νατιον ιν τηε Ωορκπλαχε;* φορ μορε ινφορματιον ον Κεαν&#9647;σ νον−δισχριμινατιον πολιχψ ανδ προχεδυρ εσ, ανδ προτεχτεδ χατεγοριεσ υνδερ τηε πολιχψ, πλεασε ϖισιτ: ηττπσ://ωωω.κεαν.εδυ/οφφιχεσ/αφφιρμα τιϖε−αχτιον.

## Americans with Disabilities Statement

Students with documented disabilities who may need instructional accommodations or special arrangements in the event of an evacuation should notify the instructor as soon as possible and no later than the second week of the term. Students may also contact The Office of Accessibility Services by phone at (908) 291-3137 or email accessibilityservices@kean.edu to discuss special needs, accommodations and arrangements.

## Τιτλε ΙΞ

Τιτλε ΙΞ οφ τηε Εδυχατιον Αμενδμεντσ οφ 1972 (Τιτλε ΙΞ) προηιβιτσ δισχριμινατιον ον τηε βασισ οφ σε ξ ιν εδυχατιον προγραμσ ορ αχτιϖιτιεσ.&#9647; Σεξυαλ ηαρασσμεντ ιν ανψ φορμ ωιλλ νοτ βε τολερατεδ ατ Κ εαν Υνιϖερσιτψ.&#9647; Σεξυαλ ηαρασσμεντ βψ στυδεντσ σηουλδ βε ρεπορτεδ το τηε Οφφιχε οφ Αφφιρματιϖ ε Αχτιον Προγραμσ, Οφφιχε οφ τηε ςιχε Πρεσιδεντ φορ Στυδεντ Αφφαιρσ ορ τηε Οφφιχε οφ Χομμυνιτψ Σ

τανδαρδσ ανδ Στυδεντ Χονδυχτ ιμμεδιατελψ.☐ Ινφορματιον αβουτ τηε Υνιϖερσιτψ☐σ Σεξυαλ Μισχονδ υχτ Πολιχψ μαψ βε φουνδ ατ τηε φολλοωινγ: ηττπσ://ωωω.κεαν.εδυ/οφφιχεσ/πολιχιεσ/σεξυαλ– μισχονδυχτ–πολιχψ.☐☐

☐<u>Σψλλαβυσ Υπδατεσ:</u>

<span style="color:red">Ινστρυχτορ ρεσερϖε τηε ριγητ το χηανγε τηε σψλλαβυσ ατ ανψ τιμε τηρουγηουτ τηε σεμεστερ.</span> Αλλ χη ανγεσ ωιλλ βε αννουνχεδ ιν χλασσ ανδ α νεω σψλλαβυσ ωιλλ βε ελεχτρονιχαλλψ αϖαιλαβλε το αλλ σ τυδεντσ. Ιφ ψου αρε ενρολλεδ ιν τηισ χλασσ παστ τηε αδδ/δροπ δατε ψου αρε συβφεχτεδ το αλλ ρυλεσ ιν τηισ σψλλαβυσ.