

| Course Name : Databases |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
|-------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|-------------------|---------|------|
| Course Code             | Course Type                                                | Regular Semester                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Lecture (hours/week) | Seminar (hours/week) | Lab. (hours/week) | Credits | ECTS |
| CMP 217                 | B                                                          | Fall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3.00                 | 0.00                 | 1.00              | 3.50    | 5.00 |
|                         |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| Lecturer                |                                                            | Klevis Topi, Msc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                      |                      |                   |         |      |
| Assistant               |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| Course language         |                                                            | Albanian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                      |                   |         |      |
| Course level            |                                                            | Bachelor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |                      |                   |         |      |
| Description             |                                                            | This course provides the necessary theoretical and practical foundations for relational database management systems. It also covers data analysis and modeling using entity-relationship techniques, relational theory and normalization, and the SQL language.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| Objectives              |                                                            | Get ready to acquire some seriously marketable programming skills! You can't consider yourself a complete end to end developer until you can code in SQL. Today, data has become the hottest topic in technology and a company's biggest asset is their data. All databases require the language SQL to store and retrieve data. The great thing is, for this course, you do not need any prior experience in programming what so ever. SQL is a different animal and we're going to demystify the language from scratch and prepare you with plenty of progressively challenging assignments so that by the time you've completed the course, you can call your self an Oracle SQL Master! Oracle is the most popular relational database in the world! |                      |                      |                   |         |      |
| Core Concepts           |                                                            | Basics of Tables SELECT and WHERE Clause WHERE, AND & OR with Operators BETWEEN, IN and NULL Single Table Queries Single Row Functions Grouping Functions GROUP BY and HAVING Clause Joins Inner and Outer Joins EXISTS & NOT EXIST Operators Creating Your Own Tables Using ALTER Creating Tables with SELECT & UPDATE Data DELETE, TRUNCATE, and DROP Commands                                                                                                                                                                                                                                                                                                                                                                                         |                      |                      |                   |         |      |
| Course Outline          |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| Week                    | Topic                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 1                       | Introduction to Database Systems, Database System Concepts |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 2                       | Entity-Relationship Model                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 3                       | Enhanced Entity Relationship Model                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 4                       | Relational Data Model                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 5                       | Relational Algebra I                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 6                       | Relational Algebra II                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 7                       | Normalizing a database                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 8                       | Midterm                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 9                       | Introduction to SQL                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 10                      | DML data manipulation instructions                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 11                      | More DML instructions, DDL table creation instructions     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 12                      | Introduction to MySQL, database design in MySQL            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 13                      | Tables in MYSQL                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |
| 14                      | Retrive data from tables using MySQL statements            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                      |                   |         |      |

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|--------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|
| 15                                                                       | Database Programming                                          |                                                                                                                                                                                                                                                                                                        |                  |               |
| 16                                                                       | Final Exam                                                    |                                                                                                                                                                                                                                                                                                        |                  |               |
| Prerequisites                                                            |                                                               | The student must attend the course at a minimum rate of 75%.                                                                                                                                                                                                                                           |                  |               |
| Literature                                                               |                                                               | <ul style="list-style-type: none"><li>• Ch. FEHILY, SQL – Third Edition, 2008</li><li>• Jay Greenspan and Brad Bulger, ‘MySQL/PHP Database application’, 2001, Published by M&amp;T Books</li><li>• Emasri, Navathe, “Fundamentals of Database Systems”, 2011 sixth edition, Addison Wesley.</li></ul> |                  |               |
| References                                                               |                                                               | <ul style="list-style-type: none"><li>• Alba Como, Xheni Melo, Menaxhimi bazë të dhënash, 2018, EneaS, Tiranë.</li></ul>                                                                                                                                                                               |                  |               |
| Course Outcome                                                           |                                                               |                                                                                                                                                                                                                                                                                                        |                  |               |
| 1                                                                        | The student manages to create a simple database               |                                                                                                                                                                                                                                                                                                        |                  |               |
| 2                                                                        | The student manages to make simple queries in the database    |                                                                                                                                                                                                                                                                                                        |                  |               |
| 3                                                                        | The student is introduced to the basic components of an RDBMS |                                                                                                                                                                                                                                                                                                        |                  |               |
| Course Evaluation                                                        |                                                               |                                                                                                                                                                                                                                                                                                        |                  |               |
| In-term Studies                                                          |                                                               | Quantity                                                                                                                                                                                                                                                                                               | Percentage       |               |
| Midterms                                                                 |                                                               | 1                                                                                                                                                                                                                                                                                                      | 15               |               |
| Quizzes                                                                  |                                                               | 2                                                                                                                                                                                                                                                                                                      | 20               |               |
| Projects                                                                 |                                                               | 0                                                                                                                                                                                                                                                                                                      | 0                |               |
| Term Projects                                                            |                                                               | 0                                                                                                                                                                                                                                                                                                      | 0                |               |
| Laboratory                                                               |                                                               | 0                                                                                                                                                                                                                                                                                                      | 0                |               |
| Class Participation                                                      |                                                               | 1                                                                                                                                                                                                                                                                                                      | 5                |               |
| Total in-term evaluation percent                                         |                                                               |                                                                                                                                                                                                                                                                                                        | 40               |               |
| Final exam percent                                                       |                                                               |                                                                                                                                                                                                                                                                                                        | 60               |               |
| Total                                                                    |                                                               |                                                                                                                                                                                                                                                                                                        | 100              |               |
| ECTS Workload (Based on Student Workload)                                |                                                               |                                                                                                                                                                                                                                                                                                        |                  |               |
| Activities                                                               |                                                               | Quantity                                                                                                                                                                                                                                                                                               | Duration (hours) | Total (hours) |
| Course duration (Including the exam week: 16x Total hours of the course) |                                                               | 16                                                                                                                                                                                                                                                                                                     | 4                | 64            |
| Study hours outside the classroom (Preparation, Practice, etc.)          |                                                               | 14                                                                                                                                                                                                                                                                                                     | 4                | 56            |
| Duties                                                                   |                                                               | 0                                                                                                                                                                                                                                                                                                      | 0                | 0             |
| Midterms                                                                 |                                                               | 1                                                                                                                                                                                                                                                                                                      | 2                | 2             |
| Final Exam                                                               |                                                               | 1                                                                                                                                                                                                                                                                                                      | 2                | 2             |
| Other                                                                    |                                                               | 0                                                                                                                                                                                                                                                                                                      | 0                | 0             |
| Total Work Load                                                          |                                                               |                                                                                                                                                                                                                                                                                                        |                  | 124           |
| Total Work Load / 25 (hours)                                             |                                                               |                                                                                                                                                                                                                                                                                                        |                  | 4.96          |
| ECTS                                                                     |                                                               |                                                                                                                                                                                                                                                                                                        |                  | 5.00          |