**Computer Science and Engineering (CSE) Program** (*Undergraduate*)

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| **Course Code** | CSE 303L | **Course Title** | Lab work for CSE303 |
| **Course Type** | Elective | **Prerequisite (if any)** | |
| **Credit Value** | 1 (T: 0.5, L: 0.5) | **Contact Hours / Week** | 1.5 hours (Lab) |

### COURSE DESCRIPTION

Conventional and database approaches. Basic concepts of DBMS. Hierarchical, network and relational data models. Entity-relationship modeling. Relational database designing: decomposition and normalization; functional dependencies. Relational algebra and calculus. Structured query language (SQL). Query optimization. Database programming with SQL and PL/SQL. Database security and administration. Distributed databases. Object-oriented data modeling. Specific database systems: oracle, MS SQL server, access.

### COURSE OBJECTIVE

In this course, students will get an overview of the following:

1. Foundation knowledge in database concepts, technology, and practice to groom students into well informed database application developers.
2. Strong practice in SQL programming through a variety of database problems.
3. Develop database applications using front-end tools and back-end DBMS.

### COURSE POLICY

a. It is the student's responsibility to gather information about the assignments/project and cover topics during the lectures missed. Regular class attendance is mandatory. Points will be taken off for missing classes. Without 70% of attendance, sitting for the final exam is NOT allowed. Students should come on time to get the attendance. In the event of failing 70% of attendance, a student will receive a W grade automatically.

b. Same project work is assigned to all sections. Students should work in groups for the project. They are required to prepare a final report on the project which will be incrementally developed through assignments.

c. The date and syllabus of class tests, Mid-Term and Final-Term will be announced in the class. There is NO provision for make-up.

d. Both the Mid-Term and Final-Term exams will be coordinated exams and will be held on a specific date  for

all the sections.

e. The reading materials for each class will be given prior to that class so that students may have a cursory look into the materials.

f. Class participation is vital for a better understanding of the topics of this course. Students are invited to raise questions.

g. Students should take tutorials with the instructor during office hours. Prior appointment is required. h. Students must maintain the IUB code of conduct and ethical guidelines offered by the school of computer science and engineering.

i. No working mobile phones are allowed in class. Using one for any purpose will result in serious consequences.

## ACADEMIC DISHONESTY

a. A student who cheats, plagiarizes, or furnishes false, misleading information in the course is subject to disciplinary action up to and including an F grade in the course and/or suspension/expulsion from the University.

b. Students must maintain the code of IUB.

c. The goal of homework is to give you practice in mastering the course material. Consequently, you are encouraged to collaborate on problem sets. In fact, students who form study groups generally do better on exams than do students who work alone. If you do work in a study group, however, you owe it to yourself and your group to be prepared for your study group meeting. Specifically, you should spend at least 30-45 minutes trying to solve each problem beforehand by yourself. If your group is unable to solve a problem, talk to other groups or ask your recitation instructor or teaching assistant assigned to your class.

d. You must write up each problem solution by yourself without assistance. It is a violation of this policy to submit a problem solution that you cannot orally explain to a member of the course staff. e. No collaboration whatsoever is permitted during examination.

f. Plagiarism and other anti-intellectual behavior cannot be tolerated in any academic environment that prides itself on individual accomplishment. If you have any questions about the collaboration policy, or if you feel that you may have violated the policy, please talk to one of the course staff. Although the course staff is obligated to deal with cheating appropriately, we are more understanding and lenient if we find out from the transgressor himself or herself rather than from a third party or by ourselves.

## STUDENT WITH DISABILITIES AND STRESS

Students with disabilities are required to inform the Department of Computer Science & Engineering of any specific requirement for classes or examination as soon as possible. Additionally, if you experience significant stress or worry, changes in mood, or problems eating or sleeping this semester, whether because of this or any other courses or factors, please do not hesitate to reach out immediately, at any hour, to any of the

course's heads to discuss.

## COURSE CONTENT

**Web application architecture & HTML5:**

1. Students will be introduced to the web application architecture.
2. Students will learn how the Model-Views-Template (MVT) design pattern works. 3. Students will be introduced to HTML5.
4. Students will basic HTML5 document structure.
5. Students will learn how to use Github to upload project codes to Github repositories. 6. Students will learn widely used HTML tags and its uses.
7. Students will learn URL schemes, hierarchy, and query parameters.
8. Students will learn to create HTML5 web pages.

**CSS & Responsive Designing:**

1. Students will learn about CSS selectors, properties, and style placement.
2. Students will learn how to use CSS styling along with HTML web pages to design a web page. 3. Students will be introduced to responsive web page designing using CSS.

**JavaScript:**

1. Students will learn JavaScript arrays, functions, and objects.
2. Students will be introduced to JavaScript regular expressions and exceptions.

**Document Object Model (DOM) and jQuery:**

1. Students will be introduced to the concept of DOM.
2. Students will learn DOM manipulation with JavaScript.
3. Students will learn to use jQuery select elements, manipulate elements, DOM traversal, events, and effects.

**Client-side Storage & Server-Browser Communication:**

1. Students will be introduced to web server.
2. Students will learn communication between a browser and a server using HTTP, AJAX, Rest API, and HTML5 web sockets.

**Introduction to MySQL:**

1. Students will learn how to use MySQL Workbench.
2. Students will learn how to create a new database using MySQL workbench.
3. Students will learn how to manipulate the data in the database.
4. Students will learn how to create, read, update, and delete data from a database using SQL queries.

**Introduction to Node.js & MySQL CRUD operations:**

**1.** Students will be introduced to the Node.js Framework.
**2.** Students will learn how to use Node.js and MySQL queries to do CRUD (Create-Read-Update-Delete) operations.

**Node.js & MySQL:**

1. Students will learn how to load CSV files to MySQL database using Node.js.
2. Students will learn how to use SQL queries to load data from MySQL database to the application interface.

**Plotly:**

1. Students will learn how to create interactive plotly graphs in Node.js.

| CLOs | CO Description | Bloom's Learning Level* | | | | PLO Assessed | CLO – PLO Correlation** |
|------|----------------|---|---|---|---|--------------|------------------------|
| | | C | P | A | S | | |
| CLO1 | Solid foundation on the database design using query language SQL and design of application. | | 3 | | | PLO-a | 3 |
| CLO2 | Present project work individually or in a group | 3 | | | 3 | PLO-b | 3 |
| CLO1 | Solid foundation on the database design using query language SQL and design of application. | | 3 | 3 | | PLO-f | 3 |

**\*Bloom's Learning Level:** Numbers signifies the Level of Bloom's skills.

**\*\*CLO – PLO Correlation:** 3 – high, 2 – medium, 1- low

**PLO-a: Engineering Knowledge**: Apply knowledge of mathematics, natural science, engineering fundamentals and electrical & electronic engineering specialization as specified in K1 to K4 respectively to the solution of complex engineering problems.

**PLO-b: Problem Analysis**: Identify, formulate, research literature, analyze and reach substantiated conclusions along with recommendations for complex electrical & electronic engineering problems using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4)

**PLO-f: The Engineer and Society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex electrical & electronic engineering problems. (K7)

**LESSON PLANNING WITH MAPPING OF CLO, TEACHING AND ASSESSMENT STRATEGIES**

| Week Topic | Teaching-Learning Strategy | Assessment Strategy | Corresponding CLOs |
|------------|---------------------------|---------------------|--------------------|

| | | | |
|---|---|---|---|
| Introduction: Course Overview & Project Requirements | Lab (1h) | | CLO1 |
| Web application architecture & HTML5 | Lab (1h) | | CLO1 |
| HTML5 & CSS | Lab (1h) | | CLO1 |
| Responsive Design & JavaScript | Lab (1h) | | CLO1 |

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|---|---|---|---|
| Document Object Model (DOM) and jQuery | Lab (1h) | | CLO1 |
| Client-side Storage & Server-Browser Communication | Lab (1h) | | CLO1 |
| Introduction to MySQL | Lab (1h) | | CLO1 |
| Introduction to Node.js & MySQL CRUD operations | Lab (1h) | | CLO1 |
| Node.js & MySQL | Lab (1h) | | CLO1 |
| Node.js & Plotly | Lab (1h) | | CLO1 |
| Project Review & Suggestions | Project Work | | |
| **Project demonstration and presentation**. | Project Work | Project Demo | CLO2 |
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## ASSESSMENT AND EVALUATION

| Continuous Assessment | Lab work assessment | 30% | Model | 100% |
|---|---|---|---|---|
| | Progressive Project assessment | 45% | Analyze, Develop | |
| | Project Report | 25% | Demonstrate, Use | |
| | | | **Total** | 100% |

**The following chart will be followed for grading. Please note that for each category.**
**\* Numbers are inclusive**

| A | A- | B+ | B | B- | C+ | C | C- | D+ | D | F |
|---|---|---|---|---|---|---|---|---|---|---|
| 90-100 | 85-89 | 80-84 | 75-79 | 70-74 | 65-69 | 60-64 | 55-59 | 50-54 | 45-49 | 0-44 |

## REFERENCE BOOK AND ADDITIONAL MATERIALS

The course will be based mostly on the following books [some other books and journals may be referred time to time]:

1. **Modern Database Management by Jeffrey A. Hoffer, Mary B. Prescott, Fred R. Mcfadden**
2. **Database Management Systems, by Raghu Ramakrishnan and Johannes Gehrke 3. Fundamentals of Database Systems, By RamezElmasri, Shamkant B. Navathe 4. Microsoft MSDN, W3 School**
5. **An Introduction to Database System by C. J. Date**
6. **Full-Stack React Projects: Learn MERN Stack Development by Shama Hoque**