**Lab Assignment #3 – Designing and implementing a complete web app using MEAN stack**

Due Date: Week 9.

Purpose: The purpose of this homework is to:

1. Build an Express Rest API
2. Build an Angular MVC front end that utilizes Express Rest API
3. Perform CRUD operations

References: Read the textbook, lecture slides, and class examples. This material provides the necessary information that you need to complete the exercises.

Be sure to read the following general instructions carefully:

- This assignment must be completed using the **pair programming technique** (https://en.wikipedia.org/wiki/Pair\_programming).

- You will have to demonstrate your solution in a scheduled lab session, and submit the project using the assignment link on Dropbox. **You VS project name should be named “YourFullNameLab3” and should be zipped in a file YourFullNameLab3.zip**. “**YourFullName”** contains both full names of the students.

**Exercise 1**

Create an **Express Rest API** which exposes CRUD functionalities for a student/course system. Create a *student* model which describes student information (*student number*, *password*, *first name*, *last name*, *address*, *city*, *phone number*, *email*, *program*) and also a *course* model which describes course information (*course code*, *course name*, *section*, *semester*). The information should be stored in a MongoDB database. Use ***ref*** to allow a *student* document to make a reference to corresponding *course* document. Provide **authentication** capabilities using **Passport – local** strategy.

Create an **Angular MVC front end** that allows students to *login*, *add* a course, *update* a course (for example change the section), *drop* a course, *list* all the courses taken by a student, list all students, list all courses, and list all students that are taking a given course.

Apply MVC principles. Design nice and friendly web pages.

(10 marks)

**Evaluation:**

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| **MongoDB database** (config files, models) | 10% |
| **Express Rest API** | 40% |
| **Angular MVC** | 35% |
| **Friendliness** (using CSS to align the HTML elements, etc.) | 10% |
| **Innovative features** | 5% |
| **Total**: | 100% |