CS572 – Modern Web Application Programming: Infinity and a Point
Creating web applications using various backend and frontend technologies (Node, Express, MongoDB, Angular)

Course Overview

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Theme I: JavaScript, NodeJS and Express- The Nature of Life is to Grow – Life is structured in layers						
Week 1	Asynchronous JS, Promise, Observables	Introduction to Node and V8, The Event Loop	Modules, Events Buffers, Streams, Files, Reactive Web Server	NPM, Scalability, Child Processes, Clusters, Worker Threads	REST, JSONP, CORS Requests. Express Settings, Security Headers	Middleware, Routing, Error Handling
Theme II: NoSQL DB, MongoDB and Mongoose - Purification Leads to Progress						
Week 2	Introduction to NoSQL and Schema Design	CRUD, Query operators, Indexes, Geospatial API	Aggregation Framework, Replica set, Sharding	Mongoose / Review	Midterm Exam	Break
Theme III: Angular - Every Action has a Reaction						
Week 3	Modern Web Browsers and TypeScript	Components, Input, Output, Shadow DOM	Change Detection, Zones, Directives, Pipes	Dependency Injection, Routing, Guards, Modules, LazyLoading, HTTP	Template Forms, Data Binding Forms, JWT, oAuth2, JIT, AOT, Server Side Rendering	Angular Elements, State Management with Redux / Review
Theme IV: Integrating all parts together - The Whole is Greater than the Sum of the Parts						
Week 4	Project	Project	Project	Final Exam		

CS572
Modern Web Application Programming
Infinity and a Point

Asaad Saad, M.S.

COURSE GOAL

This course provides a systematic introduction to programming interactive and dynamic modern web applications for individuals experienced in web application programming.

Course Objectives

In this course you will learn the Reactive Programming Architecture of SPA (Single Page Web Applications) along with all the necessary skills to build a full Modern Web Application. Technologies include: NodeJS, ExpressJS, TypeScript, Angular, Firebase and NoSQL databases (MongoDB). The course will cover:
- How the C++ V8 engine and asynchronous code work in Node and the Node event loop.
- How to structure your code for reuse and build Restful API using modules and ExpressJS.
- How NoSQL databases work: Mongo Shell, Aggregation framework, Replica Sets, Clustering, Shards, Mongoose ORM.
- Deep understanding of how Angular (backed by Google) works, Change Detection, Reactive RxJs programming with Observables and Subjects, The Shadow DOM, Zones, Modules and Components, Customized Directives and Pipes, Services and Dependency Injection, Forms (Template Driven and Data Driven), Data Binding, Routing and Guards, HTTP client, Authentication and Route Protection, CLI and Unit Test.

Evaluation Criteria

Midterm Exam	40%
Final Exam	40%
Final Project	15%
Homework	5%
Attendance and Etiquete	0%, -3%

Please find CS572 grading scale:

A+ 97 - 100
A   92 - 96
A- 88 - 91
B+ 84 - 87
B   79 - 83
B- 75 - 78
C+ 71 - 74
C   66-70
C- 62-65

Morning Meditation Policy for Computer Science Master Degree

Students need to attend 60% of the Dalby morning meditations over the aggregate of their regular computer science courses in order to graduate. Attendance during SCI and Forest Academy courses must be 80% or more.

Students may earn extra credit towards their final grade in a computer science course if they have outstanding attendance at the morning meditations for any specific computer science block.

- 70% and above: 0.5% EC (16 days in a standard block)
- 80% and above: 1% EC (18 days in a standard block)
- 90% and above: 1.5% EC (20 days in a standard block)

Details: For a given block 60% of 22 days would be 14 days or more. Students can attend fewer than that some blocks if they make up the difference in other blocks. Attendance deficiencies can be remedied by participating in TM Retreats either on campus or in the field. A 3-day retreat will count for 15 meditations, 4 day for 20 meditations, 5 day for 25 meditations, etc.

Contact Info

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Class Attendance

Attendance at all classes is required, because all elements of class — lectures, questions and answers, discussions, laboratory work — contribute to the learning process. Absences are usually excused only if you are sick in bed or have a family emergency.

If you must miss a class, please let your instructor know ahead of time. Call, send an email, or send a note with a friend. There is no such thing as a "personal day." If you have personal business to take care of, please schedule it for after class or during the days between blocks. At the same time, it may occasionally be necessary for you to miss a class (or part of a class) for some reason other than illness or family emergency. Please speak with the instructor beforehand, who will be open to considering your needs.

The first lesson of each course is the most important. Students are expected to be present from the first lesson onward. Any student not present on the first morning (except for such compelling reasons as illness or family emergency) may be asked to withdraw from the course. Unexcused absences may result in the student receiving a grade of NC (No Credit) for the whole course.

PUNCTUALITY

Punctuality is expected and required in the professional world. People commonly lose their jobs for being late — especially new college graduates unfamiliar with professional expectations. Colleges and universities have come under criticism for not properly preparing students in these values.

Therefore we place a similarly high value on arriving on time for every class session. If students are late, they disrupt the learning environment and may miss the wholeness of the lesson. Coming late is unprofessional and shows lack of courtesy to the instructor and to fellow students.

Thus the faculty request that students arrive a couple minutes early, so everyone is seated and settled when the class begins. *Well begun is half done.*

Punctuality also extends to returning from the class break in a timely fashion (as announced by the professor at the beginning of the break). The instructor should not need to go out and round up students.

If you need to be late to class for some reason beyond your control (a dentist appointment, for example), please arrange that with me ahead of time.

CLASS PARTICIPATION

American companies (and universities) expect employees (and students) to be active participants in discussions about projects and plans. This is in contrast to many other cultures in Asia and Africa that many of our students are from. Our classrooms are a great environment to get used to being a more active participant. Being an active participant means volunteering information and asking questions from your side—i.e., raising your hand to make a comment or ask a question without being prompted by the professor. This should always be done in a polite manner, but it is not sufficient to sit silently and passively unless called upon.

DRESS

LEADERSHIP — Classic professional [10]
> For men, suits, jackets, dress shirts, ties, dress pants, dress shoes with socks. For ladies, suits, career dresses or blouses and skirts (knee length or longer) with jackets and cardigans, pant suits, dress shoes.

PROFESSIONAL — Typical of what is expected for most professionals in industry. [9]
> For men, dress shirts with collars and sleeves, tucked in and buttoned, dress pants, clean nice shoes with socks. For ladies, sweaters and skirts (knee length or longer), career slacks, dresses (knee length or longer), coordinated outfits.

OFFICE CASUAL -- Less professional but acceptable for class [8]
> Knit shirts with collar, casual button shirts with collar, casual pants (blue jeans or other colored denim jeans of the blue-jean style are not acceptable).

LOUNGE CASUAL – Barely acceptable for class, not acceptable in most professional settings [7]
> Knit shirts with no collar, sweatshirts, denim jacket, wrinkled or ill-fitting clothes, untucked shirts unless they are designed to be worn untucked

BEACH (INAPPROPRIATE) — Students will be asked to change for class or dining at lunchtime. [0]

> For everyone, jeans (blue, black, green, etc),, T-shirts, shorts, asana clothes, flip-flops; torn, dirty, or sloppy clothes. For men, sleeveless shirts or improperly fitting clothes. For ladies, camisole or spaghetti strap tops, skirts or dresses above the knee or with high slits. very tight or low-cut apparel, uncovered midriffs. Hats should not be worn in class or any professional setting.