MET CS602 O1 (Spring1 2025) - Server-Side Web Development (Online)

Instructor

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Course Description

The Server-Side Web Development course concentrates primarily on building full stack applications using the state of the art tools and frameworks. The course is divided into various modules covering in depth the following topics: NodeJS, Express, React, MongoDB, Mongoose ODM, Sequelize ORM, REST and GraphQL APIs, and application security. Along with the fundamentals underlying these technologies, several applications will be showcased as case studies. Students work with these technologies starting with simple applications and then examining real world complex applications. At the end of this course, students would have mastered developing the full stack applications using the MERN stack and related technologies.

Course Prerequisites

CS601(*Web Application Development*), or instructor's consent.

Course Grading Policy

The course grade will be based on programming assignments (30%), discussion posts (10%), proctored final exam (30%), and a term project (30%). Assignments are expected to be submitted by their respective due dates. Late submissions carry a penalty.

Course Web Site

- **https://learn.bu.edu**

References

Reference Books

- *Web Development with Node and Express: Leveraging the JavaScript Stack, 2nd Edition* , by Ethan Brown, O'Reilly, 2019. ISBN: 9781492053507
- *Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node, 2nd Edition*, by Vasan Subramanian, APress, 2019. ISBN: 9781484243916
- *Full-Stack Web Development with GraphQL and React: Taking React from frontend to full-stack with GraphQL and Apollo, Second Edition*, by Sebastian Grebe, Packt, 2022. ISBN: 9781801077880

Student Conduct Code

Please review the academic conduct code

Tentative Course Schedule

- Module 1 -- Introduction to Node.js
  - Node.js Modules
  - Web Applications with Node.js (Core Node modules)
  - Events and Streams, Event Handling
- Module 2 -- Web Applications - Express Framework
  - Client-server Node.js applications
  - Web Applications using Express.js Framework
  - Routing and REST APIs
- Module 3 -- Databases and MERN Stack Applications
  - Persistence using Relational Databases (Sequelize ORM)
  - React Components
  - Full Stack Applications - MERN Stack
- Module 4 -- Persistence - MongoDB and Mongoose
  - Persistence using MongoDB and Mongoose ODM
  - Full stack MongoDB applications
- Module 5 -- GraphQL Applications
  - GraphQL Types and Schemas
  - Queries, Mutations, and Resolvers
  - Implementing GraphQL subscriptions
  - Full stack GraphQL applications
- Module 6 -- Web Application Security and Deployment
  - Secure Programming
  - Authentication and Authorization, Passport.js
  - Deploying Full Stack Applications to Cloud
- **Term Project Submission**
- **Final Exam**