

# IT6203 IT Design Studio (fall 2018)

Dr. Svetlana Peltsverger

IT Department

Kennesaw State University

## Contents

[Catalog Description](#)

[Course Outcomes](#)

### [Module 1 Innovations](#)

[\*Introduction and Module Summary\*](#)

[\*Objectives and Outcomes\*](#)

[Required Materials](#)

[Optional Materials](#)

### [Module 2 Rapid Application Development](#)

[\*Introduction and Module Summary\*](#)

[\*Objectives and Outcomes\*](#)

[Required Materials](#)

### [Module 3 Team Dynamics](#)

[\*Introduction and Module Summary\*](#)

[\*Objectives and Outcomes\*](#)

[Required Materials](#)

[Optional Materials](#)

### [Module 4 MEAN Stack \(MN\)](#)

[\*Introduction and Module Summary\*](#)

[\*Objectives and Outcomes\*](#)

[Required Materials](#)

[Optional Materials](#)

### [Module 5 MEAN Stack \(EA\)](#)

[\*Introduction and Module Summary\*](#)

[\*Objectives and Outcomes\*](#)

[Required Materials](#)

[Optional Materials](#)

### [Module 6 Angular Forms](#)

[\*Introduction and Module Summary\*](#)

[\*Objectives and Outcomes\*](#)

[Required Materials](#)

[Optional Materials](#)

### [Module 7 TypeScript and JSON](#)

[\*Introduction and Module Summary\*](#)

[\*Objectives and Outcomes\*](#)

[Required Materials](#)

[Optional Materials](#)

### [Module 8 Angular Components](#)

[\*Introduction and Module Summary\*](#)

[Objectives and Outcomes](#)

[Required Materials](#)

[Optional Materials](#)

## [Module 9 Angular Directives](#)

[Introduction and Module Summary](#)

[Objectives and Outcomes](#)

[Required Materials](#)

[Optional Materials](#)

## [Module 10 NodeJS and ExpressJS](#)

[Introduction and Module Summary](#)

[Objectives and Outcomes](#)

[Required Materials](#)

[Optional Materials](#)

## [Module 11 MongoDB](#)

[Introduction and Module Summary](#)

[Objectives and Outcomes](#)

[Required Materials](#)

[Optional Materials](#)

## [Module 12 MongoDB \(crUd\)](#)

[Introduction and Module Summary](#)

[Objectives and Outcomes](#)

[Required Materials](#)

[Optional Materials](#)

## [Module 13 Conclusion](#)

[Introduction and Module Summary](#)

[Objectives and Outcomes](#)

## Catalog Description

Prerequisite: IT 5433 and IT 5443

This core course covers technologies and methods of designing and implementing an IT application built from multiple subsystems. Students will explore modern system architectures and integration techniques used in enterprise environment. Students will develop a complete IT application through a major project to demonstrate their proficiency in all major technical areas of IT. These may include data management, networking and communication, servers and platforms, application development, user interface, web interface or security.

## Course Outcomes

Students who complete this course successfully will be able to

- Plan, design, and develop as a team a complete IT application that consists of sub-system components.
- Implement and test the IT application integration.

## Module 1 Innovations

[Introduction and Module Summary](#)

In this module, you will learn how software changed almost every field and what new technology innovations will soon change our world. After researching how to generate the best ideas, you will decide on which idea you will work this semester.

### Objectives and Outcomes

This module directly supports highlighted course outcome(s)  
Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Appreciate how computing contributes to solving tomorrow's complex problems	Identify a problem and plan a solution through the application of computing
Read assigned materials	introduce	introduced
Watch assigned videos	introduced	
Complete Module Lab	reinforced	reinforced

### Required Materials

1. Computing is Changing Everything <https://www.youtube.com/watch?v=1x54GqfL3UY> (video 5:39)
2. How to Create The Next Million Dollar App: 14 Ideas + Framework <https://www.appsterhq.com/blog/best-million-dollar-app-ideas/>
3. 40 Best App Ideas For Startups <https://www.valuecoders.com/blog/technology-and-apps/40-best-app-startup-ideas/>
4. How to Turn Your Idea Into a Product (and Launch It!) <https://www.businessnewsdaily.com/8773-turn-your-idea-into-a-product.html>
5. Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2014). Effects of problem scope and creativity instructions on idea generation and selection. *Creativity Research Journal*, 26(2), 185-191. <https://www.tandfonline.com/doi/pdf/10.1080/10400419.2014.901084?needAccess=true> (on-campus access) off-campus use <http://library.kennesaw.edu/> to locate the article.
6. 5 Big Technology Innovations Of 2018: IBM Reveals Amazing Developments That Will Impact All Of Us <https://www.forbes.com/sites/bernardmarr/2018/03/19/5-big-technology-innovations-of-2018-ibm-reveals-amazing-developments-that-will-impact-all-of-us>
7. 10 Ways Your Phone Will Save Your Life <https://www.youtube.com/watch?v=unsxUaOq8LA> (video: 9:45)
8. Patent Searching 101: A Patent Search Tutorial <http://www.ipwatchdog.com/2015/07/11/patent-searching-101-a-patent-search-tutorial-2/id=59308/>

### Optional Materials

1. 21 Great Questions for Developing New Products <https://www.sk Murphy.com/blog/2007/12/05/21-great-questions-for-developing-new-products/>
2. Rietzschel, E. F., Nijstad, B. A., & Stroebe, W. (2010). The selection of creative ideas after individual idea generation: Choosing between creativity and impact. *British journal of psychology*, 101(1), 47-68. off-campus use <http://library.kennesaw.edu/> to locate the article

## Module 2 Rapid Application Development

### Introduction and Module Summary

In this module, you will learn about Agile Software Development and advantages of Rapid Application Development (RAD). You will start prototype phase for your team project and find your customers.

### Objectives and Outcomes

This module directly supports highlighted course outcome(s)  
Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**

## 2. Implement and test the IT application integration.

## Module outcomes and activities:

After completing this module, students will be able:	Explain how Rapid Application Development works	Build group project prototype
Read assigned materials	introduced	introduced
Watch assigned videos	reinforced	reinforced
Complete Module Lab		mastered

## Required Materials

1. What is Rapid Application Development and When Should You Use It? <https://blog.capterra.com/what-is-rapid-application-development/>
2. Understanding Rapid Application Development Model <https://theappsolutions.com/blog/development/rad-model/>
3. What is Rapid Application Development <https://www.youtube.com/watch?v=JHcxbGwHtsY> (video 27:24) slides <https://www.slideshare.net/OutSystems/what-is-rapid-application-development>
4. IBM, remote-work pioneer, is calling thousands of employees back to the office <https://qz.com/924167/ibm-remote-work-pioneer-is-calling-thousands-of-employees-back-to-the-office/>

## Module 3 Team Dynamics

*Introduction and Module Summary*

In this module, you will learn the differences between groups and teams. You will use 10 Team Dynamics of High-Performance Teams to evaluate and improve your own team during each of five stages of group development: Forming, Storming, Norming, Performing, and Adjourning. Then you will apply your knowledge to adopt a model that best fits your team dynamics.

*Objectives and Outcomes*

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

## Module outcomes and activities:

After completing this module, students will be able:	Explain how team dynamics can influence project outcomes	Compare and contrast roles of product owner and team leader
Read assigned materials	introduced	introduced
Watch assigned videos		reinforced
Complete Module Discussion	reinforced	mastered

## Required Materials

1. Group Dynamics <http://open.lib.umn.edu/organizationalbehavior/chapter/9-2-group-dynamics/>
2. 10 Team Dynamics that All Great Teams-Share <https://mikecardus.com/10-team-dynamics-that-all-great-teams-share/> slides 1-15 or transcript on the page.
3. Team Effectiveness <http://libguides.gwumc.edu/c.php?g=365963&p=2473007> (all four pages)

4. Feature and Component Teams <https://www.scaledagileframework.com/features-and-components/>
5. Feature Teams <https://less.works/less/structure/feature-teams.html>
6. The Role of the Agile Product Owner [https://www.youtube.com/watch?v=-Tz\\_sMoVLbg](https://www.youtube.com/watch?v=-Tz_sMoVLbg) (video 3 min) or A Product Owner in the team? What for? <https://jp-lambert.me/a-product-owner-in-the-team-what-for-5f86607b04c1>
7. <https://www.mountangoatsoftware.com/agile/user-stories>

### Optional Materials

1. Group Dynamics and Behavior <http://open.lib.umn.edu/sociology/chapter/6-2-group-dynamics-and-behavior/>
2. Breaking Down Software Development Roles <http://zimmer.csufresno.edu/~sasanr/Teaching-Material/SAD/breaking%20down%20software%20development%20roles.pdf>
3. Team Dynamics: Problem-Solving and Decision Making <http://libguides.gwumc.edu/c.php?g=389282&p=2641496>

## Module 4 MEAN Stack (MN)

### Introduction and Module Summary

In this module, you will start installation and testing of the development environment for this course. By the end of this module, you will have Node.js and MongoDB installed and configured.

### Objectives and Outcomes

This module directly supports highlighted course outcome(s)  
Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Create development environment for individual and group projects	Test development environment for individual and group projects
Read assigned materials	introduced	introduced
Watch assigned videos	reinforced	reinforced
Complete Module Lab	reinforced	reinforced

### Required Materials

1. MongoDB Installation <https://docs.mongodb.com/manual/tutorial/install-mongodb-on-windows/>
2. MongoDB Tutorial <https://www.youtube.com/watch?v=pWbMrx5rVBE> (video 32 min) and <https://docs.mongodb.com/manual/tutorial/getting-started/>

### Optional Materials

4. HTTP request Methods <https://developer.mozilla.org/en-US/docs/Web/HTTP/Methods>
5. HTTP response Status Codes <https://developer.mozilla.org/en-US/docs/Web/HTTP/Status>
6. SQL to MongoDB Mapping Chart <https://docs.mongodb.com/manual/reference/sql-comparison/>

## Module 5 MEAN Stack (EA)

### Introduction and Module Summary

In this module, you will complete installation and testing of the development environment

for this course. By the end of this module, you will have Express and Angular installed and configured.

### *Objectives and Outcomes*

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Create development environment for individual and group projects	Test development environment for individual and group projects
Read assigned materials	reinforced	reinforced
Watch assigned videos	reinforced	reinforced
Complete Module Lab	mastered	mastered

### *Required Materials*

1. Made with Angular <https://www.madewithangular.com/categories/angular>
2. Angular Single Page Applications (SPA): What are the Benefits? <https://blog.angular-university.io/why-a-single-page-application-what-are-the-benefits-what-is-a-spa/>
3. The disadvantages of single page applications <https://adamsilver.io/articles/the-disadvantages-of-single-page-applications/>
4. Express/Node introduction [https://developer.mozilla.org/en-US/docs/Learn/Server-side/Express\\_Nodejs/Introduction](https://developer.mozilla.org/en-US/docs/Learn/Server-side/Express_Nodejs/Introduction)
5. AngularJS vs Angular 2 vs Angular 4 <https://www.youtube.com/watch?v=9AaRJ8COXdM> (video 4 min)

### *Optional Materials*

1. Popular Frameworks <http://hotframeworks.com/>
2. Express application generator <https://expressjs.com/en/starter/generator.html>

## Module 6 Angular Forms

### *Introduction and Module Summary*

In this module, you will learn why reactive programming gained popularity among developers and customers, start modeling your group project application and learn how to create reactive forms.

### *Objectives and Outcomes*

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

## Module outcomes and activities:

After completing this module, students will be able:	Appreciate reactive programming	Create reactive forms
Read assigned materials	introduced	introduced
Watch assigned videos	reinforced	reinforced
Complete Module Lab	reinforced	reinforced

## Required Materials

1. Edit the DOM <https://developers.google.com/web/tools/chrome-devtools/inspect-styles/edit-dom>
2. What is Reactive Programming? <https://blog.redelastic.com/what-is-reactive-programming-bc9fa7f4a7fc>
3. Modelling Reactive Systems with Event Storming and Domain-Driven Design <https://blog.redelastic.com/corporate-arts-crafts-modelling-reactive-systems-with-event-storming-73c6236f5dd7>
4. Reactive Forms <https://angular.io/guide/reactive-forms>
5. Reactive Forms - The Basics <https://www.youtube.com/watch?v=JeeUY6WaXiA> video 15 min.

## Optional Materials

1. The Reactive Manifesto <https://www.reactivemanifesto.org/>
2. Reactive Programming in Angular <https://blog.nrwl.io/reactive-programming-in-angular-7dcdded697e6c>
3. Angular Forms Guide - Template Driven and Reactive Forms <https://blog.angular-university.io/introduction-to-angular-2-forms-template-driven-vs-model-driven/>

## Module 7 TypeScript and JSON

*Introduction and Module Summary*

In this module, you will learn about JavaScript history and how JavaScript is related to TypeScript. You will write TypeScript code, compile and run it in a browser and in a console window. You will learn about JavaScript Object Notation.

*Objectives and Outcomes*

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

## Module outcomes and activities:

After completing this module, students will be able:	Write, compile and run TypeScript code	Use JSON files	Create and test a disaster recovery plan for your project
--	--	----------------	---

Read assigned materials	introduced	introduced	
Watch assigned videos		reinforced	
Complete Module Lab	reinforced/mastered	mastered	mastered

### Required Materials

1. Is JavaScript a (true) OOP language? <https://medium.com/@andrea.chiarelli/is-javascript-a-true-oop-language-c87c5b48bdf0>
2. TypeScript Basic Types <https://www.typescriptlang.org/docs/handbook/basic-types.html>
3. TypeScript Interfaces <https://www.typescriptlang.org/docs/handbook/interfaces.html>
4. Write Object-Oriented JavaScript with TypeScript <http://rachelappel.com/write-object-oriented-javascript-with-typescript/>
5. Generate TypeScript interfaces from JSON data <https://www.youtube.com/watch?v=NH455y3V2k> (3 min video)

### Optional Materials

1. V8 <https://github.com/v8/v8/wiki>
2. Get ready : a new V8 is coming, Node.JS performance is changing <https://medium.com/the-node-js-collection/get-ready-a-new-v8-is-coming-node-js-performance-is-changing-46a63d6da4de>
3. Make Types from JSON files <https://jvilk.com/MakeTypes/>

## Module 8 Angular Components

### Introduction and Module Summary

In this module, you will learn more about Angular components and how data binding works.

### Objectives and Outcomes

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Create and use Angular components	Create a model for group project
Read assigned materials	introduced	reinforced
Watch assigned videos	reinforced	
Complete Module Lab	mastered	mastered

### Required Materials

1. Introduction to Components <https://angular.io/guide/architecture-components>
2. One-way and Two-Way Data Binding <https://www.c-sharpcorner.com/article/angular-one-and-two-way-data-bindings-with-examples/>
3. Angular 6 Tutorial 9: Two-way data binding <https://www.youtube.com/watch?v=6wUCBJ-2Dew> (video 11 min)
4. Modeling Reactive Systems with Event Storming and Domain-Driven Design <https://blog.redelastic.com/corporate-arts-crafts-modelling-reactive-systems-with-event-storming-73c6236f5dd7>
5. How to Design User-flow Diagrams <https://www.youtube.com/watch?v=Ww-y59eVRAE>

### Optional Materials



1. Angular Components <https://angular.io/api/core/Component>
2. Angular Cheat Sheet <https://angular.io/guide/cheatsheet>

## Module 9 Angular Directives

### *Introduction and Module Summary*

In this module, you will learn how to manipulate DOM using Angular directives and how to change the appearance and behavior of an element.

### *Objectives and Outcomes*

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Implement branching and looping in an Angular application	Change attributes of an element based on the user input.	Improve group project outcomes
Read assigned materials	introduced	introduced	reinforced
Watch assigned videos	reinforced	reinforced	
Complete Module Lab	mastered	mastered	

### *Required Materials*

1. Structural Directives <https://angular.io/guide/structural-directives>
2. Attribute Directives <https://angular.io/guide/attribute-directives>
3. Angular 6 Tutorial 29: Directives <https://www.youtube.com/watch?v=7j9XrolKPwQ> (video 15 min)
4. A Practical Guide to Angular Directives <https://www.sitepoint.com/practical-guide-angular-directives/>
5. Coping with Hitchhikers and Couch Potatoes on Teams <https://www2.isye.gatech.edu/~jvandeve/Classes/4106/CouchPotatoes.pdf>

### *Optional Materials*

1. Cheat Sheet <https://angular.io/guide/cheatsheet>
2. NgIf Directive <https://angular.io/api/common/NgIf>

## Module 10 NodeJS and ExpressJS

### *Introduction and Module Summary*

In this module, you will learn how to implement server-side logic and use Angular Material components in your project.

### *Objectives and Outcomes*

This module directly supports highlighted course outcome(s)  
Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Develop an Angular application that can read data from a NodeJS/ExpressJS back-end	Use Angular material form to send data to a NodeJS/ExpressJS back-end
Read assigned materials	Introduced	Introduced
Watch assigned videos	Reinforced	
Complete Module Lab	Mastered	Reinforced

### Required Materials

1. Express Middleware <https://coursework.vschool.io/express-middleware/>
2. Express Routing <https://expressjs.com/en/guide/routing.html> and <https://www.youtube.com/watch?v=tiMLxUKrB-g> (video 8 min)
3. Node.js - RESTful API [https://www.tutorialspoint.com/nodejs/nodejs\\_restful\\_api.htm](https://www.tutorialspoint.com/nodejs/nodejs_restful_api.htm) and <https://www.youtube.com/watch?v=p-x6WdwaJco> (10 min)
4. Angular Material Buttons : Mat-Button Example <https://www.angularjswiki.com/angular/buttons-in-angular-using-material-design-mat-button-example/>
5. Angular material Components <https://material.angular.io/components/categories>

### Optional Materials

1. Node.js - Express Framework [https://www.tutorialspoint.com/nodejs/nodejs\\_express\\_framework.htm](https://www.tutorialspoint.com/nodejs/nodejs_express_framework.htm)
2. <https://medium.com/@aerdelijac/creating-a-rest-api-backend-using-express-js-7710d3310b79>

## Module 11 MongoDB

### *Introduction and Module Summary*

In this module, you will connect an Angular application to a MongoDB database and learn how to select, insert and delete data in a MongoDB database.

### *Objectives and Outcomes*

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Connect an Angular application to MongoDB	select, insert and delete data in MongoDB from an Angular application
--	---	---

Read assigned materials	Introduced	Introduced
Watch assigned videos	Reinforced	Reinforced
Complete Module Lab	Mastered	Mastered

### Required Materials

1. CRUD [https://en.wikipedia.org/wiki/Create,\\_read,\\_update\\_and\\_delete](https://en.wikipedia.org/wiki/Create,_read,_update_and_delete)
2. MongoDB CRUD Operations <https://docs.mongodb.com/manual/crud/>
3. 30+ Best MongoDB Interview Questions and Answers (2018 Update) <https://www.fullstack.cafe/blog/30-best-mongodb-interview-questions-and-answers>
4. Mongoose Getting Started <https://mongoosejs.com/docs/index.html>
5. Mongoose Schemas <https://mongoosejs.com/docs/guide.html>
6. MongoDB and Mongoose | Creating a REST API with Node.js <https://www.youtube.com/watch?v=WDrU305J1yw> (video 36 min)

### Optional Materials

1. SQL to MongoDB Mapping Chart <https://docs.mongodb.com/manual/reference/sql-comparison/>
2. MEAN Stack Angular 6 CRUD Web Application <https://www.djamware.com/post/5b00bb9180aca726dee1fd6d/mean-stack-angular-6-crud-web-application>

## Module 12 MongoDB (crUd)

### *Introduction and Module Summary*

In this module, you will use routing to add a functional menu to the project and learn how to use an Angular application to update a record in a MongoDB database.

### *Objectives and Outcomes*

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. **Plan, design, and develop as a team a complete IT application that consists of sub-system components.**
2. Implement and test the IT application integration.

Module outcomes and activities:

After completing this module, students will be able:	Use Angular routing	Us an Angular application to update documents in a MongoDB database
Read assigned materials	Introduced	Introduced
Watch assigned videos		Reinforced
Complete Module Lab	Reinforced, Mastered	Mastered

## Required Materials

1. Angular Material Menu <https://material.angular.io/components/menu/overview>
2. Routing & Navigation <https://angular.io/guide/router>
3. Mongoose(mongoDB) functions for CRUD Application <https://medium.com/@yugagrawal95/mongoose-mongodb-functions-for-crud-application-1f54d74f1b34>
4. MongoDB and Mongoose | Creating a REST API with Node.js <https://www.youtube.com/watch?v=WDrU305J1yw&t=2s> (video 36 min)

## Optional Materials

1. Angular Router Tutorial: Setting Up Routing in Your Application <https://www.intertech.com/Blog/angular-router-tutorial-setting-up-routing-in-your-application/>

## Module 13 Conclusion

### Introduction and Module Summary

In this module, you will learn about single sign-on and how it can be implemented with the NodeJS. Then we will discuss other important things in MEAN stack applications.

### Objectives and Outcomes

This module directly supports highlighted course outcome(s)

Students who complete this course successfully will be able to

1. Plan, design, and develop as a team a complete IT application that consists of sub-system components.
2. **Implement and test the IT application integration.**

Module outcomes and activities:

After completing this module, students will be able:	Discuss single sign-on concepts	Discuss features of a MEAN stack application.
Read assigned materials	Introduced, reinforced	Introduced
Complete Module Discussion		Reinforced

## Required Materials

1. Angular Security <https://angular.io/guide/security>
2. Federated Identities: OpenId vs. SAML vs. OAuth <https://www.softwaresecured.com/federated-identities-openid-vs-saml-vs-oauth/>
3. Build and Authenticate a Node.js App with JSON Web Tokens <https://auth0.com/blog/building-and-authenticating-nodejs-apps/> or Angular Security - Authentication With JSON Web Tokens (JWT): The Complete Guide <https://blog.angular-university.io/angular-jwt-authentication/>

## Optional Materials

1. Certified OpenID Connect Implementations <https://openid.net/developers/certified/>
2. Need a demo SAML Service Provider? We got you covered... <https://community.rsa.com/community/products/secuid/blog/2016/05/19/need-a-demo-saml-service-provider-we-got-you-covered>