

**MICHIGAN STATE**  
**UNIVERSITY**

# Alpha Presentation

## Training Scheduling and Optimization

### System II

## The Capstone Experience

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*From Students...  
...to Professionals*

Department of Computer Science and Engineering  
Michigan State University

Fall 2019

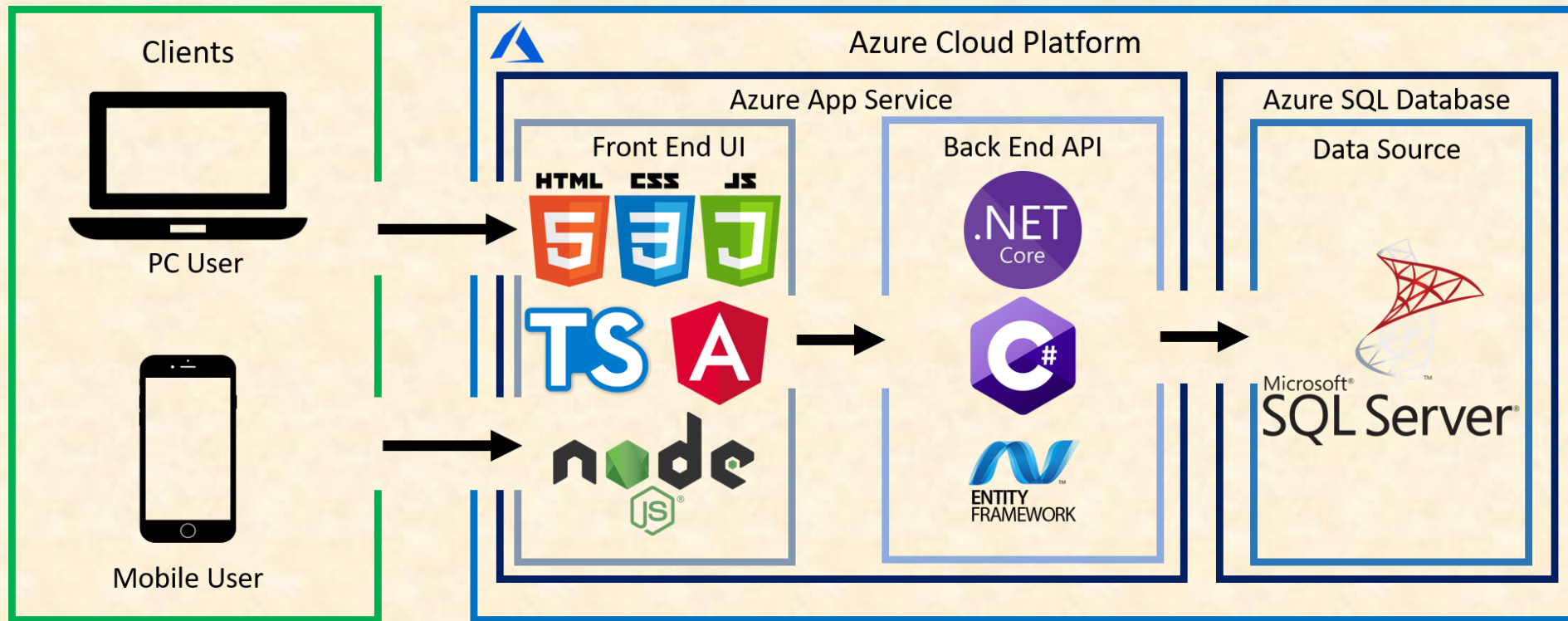
# Project Overview

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- Update and enhance the training scheduling system from the spring semester
- Make the web application responsive for mobile and tablet devices
- Implement an optimizer to recommend a schedule based off different priorities
- Expand the functionality of the application's calendars to include filtering, a course calendar, and more



# System Architecture



# Calendar Expansion

The screenshot displays the 'Learning Scheduling System' interface. At the top, the browser address bar shows 'localhost:61490/locationCalendar'. The page header includes the 'UNITED' logo, the system name 'Learning Scheduling System', and a user profile for 'Mcdaniel, Lynda'. A left-hand navigation menu lists various system functions such as 'HOME', 'CALENDARS', 'EXCEPTIONS', 'COURSE SCHEDULE', 'SCHEDULE PLANNER', 'SCHEDULE OPTIMIZER', 'COURSE CATALOG', 'INSTRUCTOR QUALIFICATIONS', 'TRAINING REQUESTS', 'ATTENDANCE', and 'ADMIN'. The main content area features a calendar for 'October 2019' with columns for days 13 through 19. Above the calendar are 'Class Filter' and 'Location Filter: den' input fields. The calendar grid shows several events: 'DEN: DIA Hangar: 1041-A' and 'DEN: DIA Hangar: 1041-B' on the 13th; 'DEN: FTC: A001' and 'DEN: FTC: A005' on the 14th; '737MAX Systems / Avionics Differences' on the 15th; 'DEN: FTC: A011' and 'DEN: Local' on the 16th; and 'B777 Systems Avionics and Reliability (2 Week)' on the 17th. A right-hand sidebar contains a 'Publish' button, an 'Export' button, and a table with columns for 'Point', 'Supervisor', and 'Instructor'. The table lists 'OPC' as the point, 'Durr, William' as the supervisor, and 'Stege, Dave J.' as the instructor. The word 'Scheduler' is visible in the bottom left corner of the interface.

	October 2019						
	13	14	15	16	17	18	19
<input type="checkbox"/> DEN: DIA Hangar: 1041-A							
<input type="checkbox"/> DEN: DIA Hangar: 1041-B							
<input type="checkbox"/> DEN: FTC: A001			737MAX Systems / Avionics Differences				
<input type="checkbox"/> DEN: FTC: A005							
<input type="checkbox"/> DEN: FTC: A011				B777 Systems Avionics and Reliability (2 Week)			
<input type="checkbox"/> DEN: Local							

Point	Supervisor	Instructor
OPC	Durr, William	Stege, Dave J.



# Schedule Optimizer – 1 of 2

The screenshot displays the 'Learning Scheduling System' interface. At the top, there is a navigation bar with the United logo and the system name. A sidebar on the left contains menu items: HOME, CALENDARS, EXCEPTIONS, COURSE SCHEDULE, SCHEDULE PLANNER, SCHEDULE OPTIMIZER (highlighted), COURSE CATALOG, INSTRUCTOR QUALIFICATIONS, TRAINING REQUESTS, ATTENDANCE, and ADMIN. The main content area features a date range selector set to '10/20/2019' to '12/20/2019', with 'Optimize' and 'Add Class' buttons. Below this is a table with a search bar and an 'Export' button. The table lists courses with columns for Action, Course Code, Course Title [hrs], Start Time, and Location.

Action	Course Code	Course Title [hrs]	Start Time	Location
<input type="checkbox"/>	POTS	Principles OF Troubleshooting [24]	08:00:00	EWR
<input type="checkbox"/>	787SA2	B787 Systems Avionics (3 Week) [120]	08:00:00	EWR
<input type="checkbox"/>	TS20	Taxi/Engine Run Student A319/A320 [16]	10:00:00	LAX
<input type="checkbox"/>	SMSPT	SMS and Your Role [8]	10:00:00	ORD
<input type="checkbox"/>	AHMAB	AHMAB: Health Monitoring Airbus Company [8]	12:00:00	HOU
<input type="checkbox"/>	WGH1	Aircraft Weigh Training [8]	09:00:00	DEN
<input type="checkbox"/>	77ENG	B777 Engine Systems [24]	09:00:00	HOU
<input type="checkbox"/>	AHMAB	AHMAB: Health Monitoring Airbus Company [8]	12:00:00	DEN

# Schedule Optimizer – 2 of 2

**UNITED**

HOME  
CALENDARS  
EXCEPTIONS  
COURSE SCHEDULE  
SCHEDULE PLANNER  
SCHEDULE OPTIMIZER  
COURSE CATALOG  
INSTRUCTOR QUALIFICATIONS  
TRAINING REQUESTS  
ATTENDANCE  
ADMIN

## Optimizer Results

Class Filter:  Location Filter:

Published 
  Planned 
  Optimizer Results

	October 2019						
	13	14	15	16	17	18	19
<input type="checkbox"/> CLE: Hangar 2, Building 212: 1							
<input type="checkbox"/> CLE: Hangar 2, Building 212: 2							
<input type="checkbox"/> DEN: DIA Hangar: 1041-A							
<input type="checkbox"/> DEN: DIA Hangar: 1041-B		737MAX Systems / Avionics Differences					
<input type="checkbox"/> DEN: FTC: A001			737MAX Systems / Avionics Differences				
<input type="checkbox"/> DEN: FTC: A005							
<input type="checkbox"/> DEN: FTC: A011	B777 Systems Avionics and Reliability (2 Week)						
<input type="checkbox"/> DEN: Local							
<input type="checkbox"/> EWR: Hangar 100: 211							
<input type="checkbox"/> EWR: Hangar 100: 212							
<input type="checkbox"/> EWR: Hangar 100: 213	B787 Systems Avionics (3 Week)						
<input type="checkbox"/> EWR: Hangar 100: 217							
<input type="checkbox"/> EWR: Hangar 55: Fir-2							
<input type="checkbox"/> EWR: Hangar 55: Fir-3							
<input type="checkbox"/> GUM: AO General Office: AT-3							
<input type="checkbox"/> HNL: Hangar: A							
<input type="checkbox"/> HOU: Building 2: 1							
<input type="checkbox"/> HOU: Building 2: 4							
<input type="checkbox"/> IAD: Hangar: 217	B757 Reliability Training						

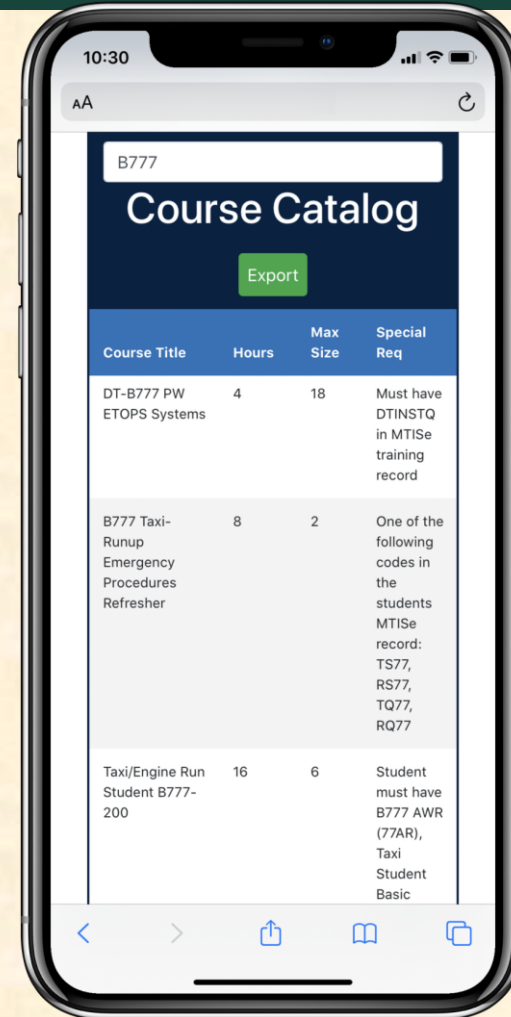
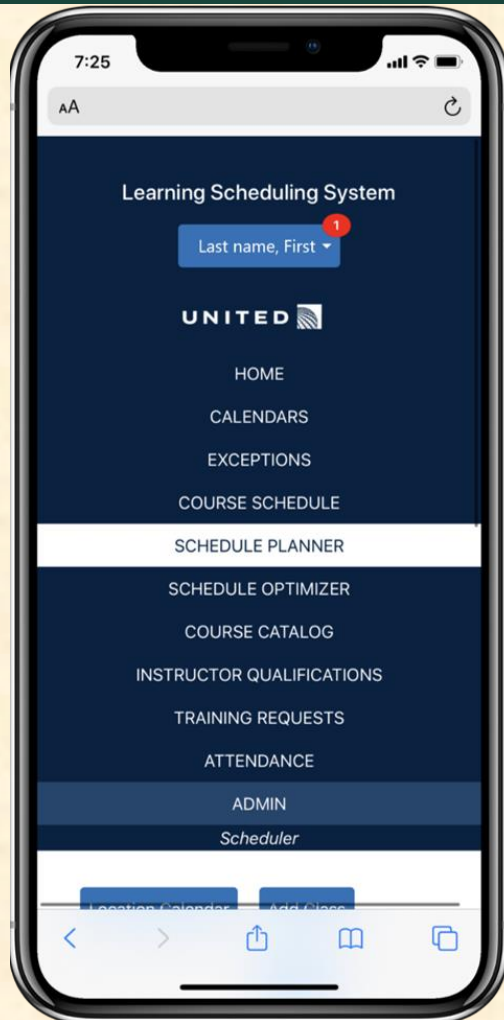
**Classes Not Included In Results**

Course Code	Course Title [hrs]	Start Time	Location	Frequency	Reason

Add Results to Planner Cancel

Scheduler

# New Mobile Styling





# What's left to do?

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- Improving the optimizer
- OAM alternative user authentication
- Conflict notifications for planner
- Class roster expansion
- Drag and drop calendar
- Browser compatibility (Internet Explorer)
- Additional user feedback and validation prompts





# Questions?

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