

**MICHIGAN STATE**  

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**UNIVERSITY**

# Project Plan Presentation

## Stroodle: Learning Management System

The Capstone Experience

Team Atomic Object

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

# Functional Specifications

- Stroodle is a Learning Management System (LMS) with the primary objective of improving upon existing LMS such as D2L, Blackboard, and Google Classroom.
- Other LMS platforms tend to be overcomplicated
  - Has redundant/rarely used functionalities
  - Has complicated dashboards for students
  - Makes course configuration for professors difficult and time consuming.
- Stroodle will provide students and faculty with an easy-to-use eLearning system with functionalities such as:
  - Uploading/downloading course files and assignments
  - Calendar reminders
  - Quizzes
  - Gradebook



# Design Specifications

- Strooodle features a clean and straight forward interface for displaying courses, events, announcements, and other course materials.
- Strooodle's interface uses a pastel type color theme for a visually pleasing and inviting experience, with color coded classes so courses are easy to differentiate.
- The web application has a navigation bar, and another column for relevant information such as notifications, calendar, and upcoming events.
- Simple course configuration for professors to upload materials, create assignments, and grade student submissions.
- The mobile app offers all the functionalities of the web application while maintaining user-friendliness.



# Screen Mockup: Home Page

The screenshot shows a web browser window with the URL `stoodle.com/home`. The page layout is as follows:

- Sidebar (Left):** A red vertical bar containing a user profile icon for **JANE DOE** (id: j.doe123) and navigation links: Home, Courses, Calendar, Settings, and Log out.
- Messages (Center):** A section titled "Messages" containing two notification cards:
  - Blue Card:** From Dr. Robert Howard (9/20/2021). Text: "Hi Jane, this is just a friendly reminder that the quiz is due this Wednesday. The quiz is based on chapter 5 in your textbook. Thanks!"
  - Yellow Card:** From Prof. Henrietta Stevens. Text: "Hello, this is a class notification for LIT 331. My records indicate that your current grade in the course is 54%. Please message me if you have any questions."A "See all messages" link is located below the messages.
- Schedule (Center):** A grid showing class times for the week of Monday to Friday:

Schedule	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM
Mon		PHY 101				HIS 232		
Tue		MI 230				HIS 232		
Wed		PHY 101		LIT 331				
Thur		MI 230						
Fri				LIT 331				
- Notifications (Right):** A section titled "Notifications" with two items:
  - HIS 232 - Project 1 Grade has been released
  - PHY 101 - Quiz 5 is due on Wednesday, September 22ndA link "End of new notifications" is below.
- Calendar (Right):** A calendar for **September 2021** showing dates from 1 to 30.
- Upcoming Events (Right):** A vertical list of events:
  - 2:30 Midterm 3 Review (Yellow dot)
  - 3:45 HW 5 Due (Blue dot)
  - Tuesday (Pink dot)
  - 10:30 (Pink dot)



# Screen Mockup: Course List

Stroodle: Learning Management x +  
stroodle.com/courses

JANE DOE  
id: j.doe123

Home  
Courses  
Calendar  
Settings  
Log out

### Introductory Physics

Dr. Robert Howard

"Hey all, please remember to finish your quiz by this Wednesday! We will be starting a new unit next week."

Current Grade: 87%  
1 Unfinished Assignment

### North American History

Mary Easton

"Project 1 grades have been released. Please let me know if you have any questions."

Current Grade: 97%  
0 Unfinished Assignments

### Literature of the 18th Century

Prof. Henrietta Stevens

"We will be reviewing midterm 3 on Monday. Attendance is mandatory if you have received less than 65 points."

Current Grade: 54%  
2 Unfinished Assignments

### Notifications

No notifications at this time

### September 2021

Sun	Mon	Tue	Wed	Thurs	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

### Upcoming Events

- 2:30 Midterm 3 Review
- 3:45 HW 5 Due


Tuesday



# Screen Mockup: Course Page

Stroodle: Learning Management x +

stroodle.com/courses/intro-phy

  
JANE DOE  
id: j.doe123

Home  
Courses  
Calendar  
Settings  
Log out

## Introductory Physics

Dr. Robert Howard

Class Files   Discussion

Quizzes   Projects

Grades   Extra Resources

### Messages From Dr. Robert Howard:

9/20/2021:  
Hey all, please remember to finish your quiz by this Wednesday!  
We will be starting a new unit next week.

9/13/2021:  
Reminder! HW 5 will be due on Monday the 20th! This is a very involved assignment so PLEASE DO NOT WAIT until the last minute to start it! If you run into any issues let me know BEFORE THE DEADLINE so you can get the help you need. I will not accept

### Notifications

No notifications at this time

### September 2021

Sun	Mon	Tue	Wed	Thurs	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

### To Do

3:45  
HW 5 Due

Tuesday

3:45  
Projectile Motion Quiz

Wednesday



# Screen Mockup: Calendar View

The screenshot shows a web browser window with the URL `stoodle.com/courses/intro-phy/calendar`. The page title is "Calendar Introductory Physics". On the left, a sidebar for user "JANE DOE" (id: j.doe123) contains links for Home, Courses, Calendar, Settings, and Log out. The main calendar area shows a grid for January and February. Activities are represented by colored bars: purple for homework, blue for lessons, green for quizzes, and grey for other activities. A tooltip for "Homework #2" is displayed over the date January 31, with the text "This homework deals with Newton's Law...".

	January						February			
	26	27	28	29	30	31	1	2	3	4
Homework #1	[Purple Bar]									
Welcome Activity		[Blue Bar]								
Quiz #1				[Green Bar]						
Lesson: Force, Motion, ...					[Blue Bar]					
Homework #2					[Purple Bar]					
Lesson: Energy							[Blue Bar]			
Reading: Chapter 1							[Blue Bar]			
Quiz #2									[Green Bar]	
Homework #3									[Purple Bar]	
Guest Lecture: Dr. Finch										
Homework #4										
Project 1: News Laws in...										
Quiz #3										
Extra Credit: Video Demo										
Lesson: Friction										



# Screen Mockup: Course Content

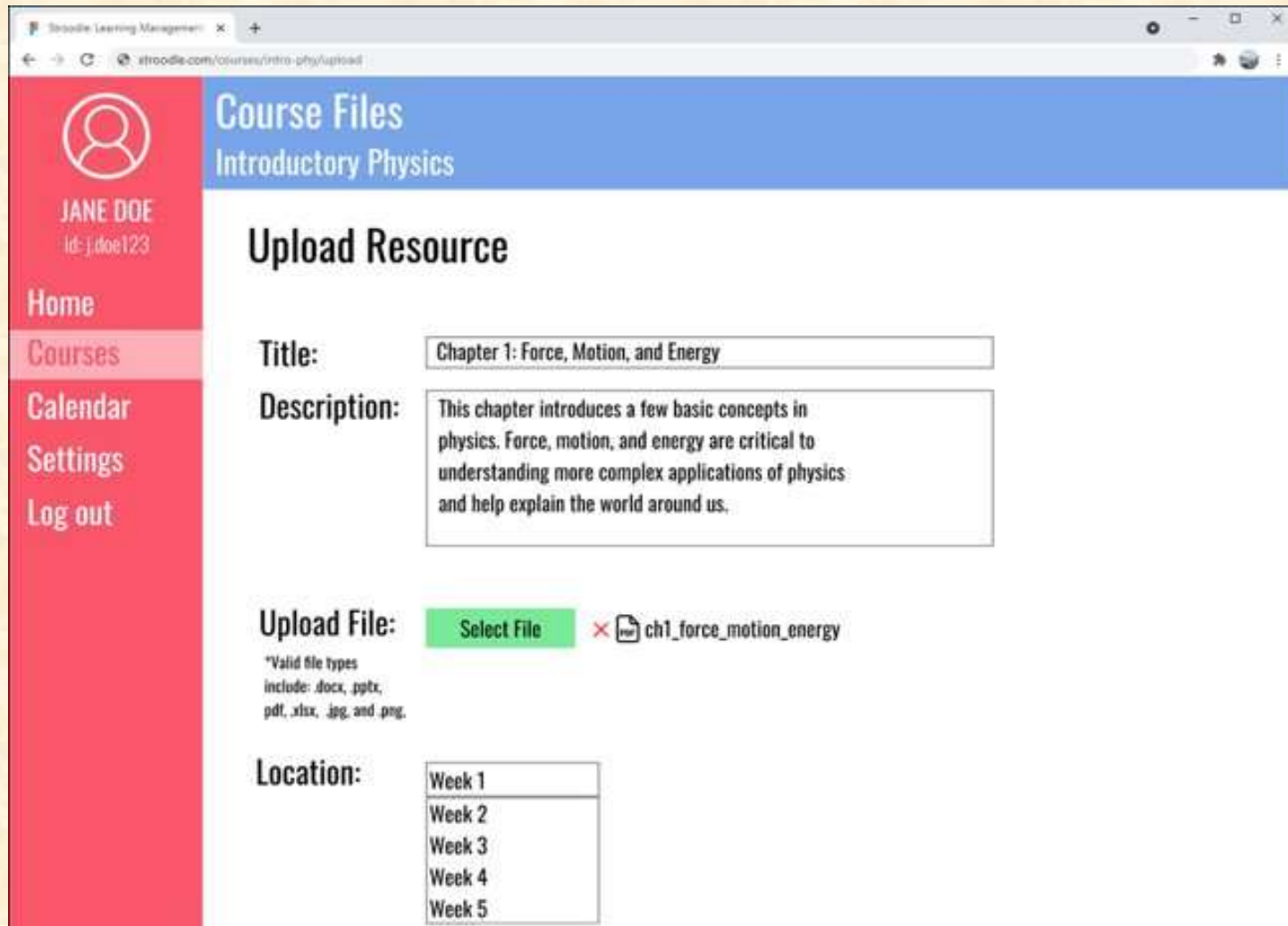
The screenshot shows a web browser window with the URL `stroodle.com/courses/intro-phy/content`. The interface is divided into three main sections:

- Left Sidebar (Red):** Contains a user profile for JANE DOE (id: j.doe123) and navigation links: Home, Courses, Calendar, Settings, and Log out.
- Course Files (Blue Header):** Titled 'Introductory Physics', it lists five weeks. Weeks 1-4 are collapsed (up arrow), and Week 5 is expanded (down arrow).
  - Week 5 Content:**
    - Position, Velocity, and Acceleration Slides (PPT)
    - Acceleration Example Problems (DOC)
    - Intro to Momentum Lecture Slides (PPT)
    - Homework 5 Problems (DOC)
- Right Panel:** Contains a 'Notifications' section with the message 'No notifications at this time', a calendar for 'September 2021', and a 'To Do' list.
  - Calendar:** Shows dates from Sun to Sat. The 5th is highlighted.
  - To Do List:**
    - 3:45 HW 5 Due (checked)
    - 3:45 Projectile Motion Quiz (pending)





# Screen Mockup: Professor File Upload



# Screen Mockup: Quiz Creation

The screenshot shows a web browser window with the URL `stoodle.com/courses/intro-phy/quizzes/new-quiz`. The page title is "Quiz Creation" for "Introductory Physics".

**Left Sidebar (User Profile):**

- Robert Howard
- id: RHow789
- Home
- Courses
- Calendar
- Settings
- Log out

**Quiz Details:**

- Name: Quiz 6: Momentum and Inertia
- Duration: from: 3:45pm 10/02/2021 to: 5:00pm 10/02/2021

**Question 1:**

1. Inertia is.....

- An object's tendency to lose momentum over time
- An object's tendency to resist changes in velocity
- A force that draws matter together
- Resistance that one object gets when moving over another

**Question 2:**


2. (Free Response) What is the difference between momentum and velocity?

**Actions and Summary:**

- Buttons: Save, Copy, Change format, Edit, Copy
- Points: 5 (with a red X icon)
- Summary: 12 Points Total, New Question, Save All

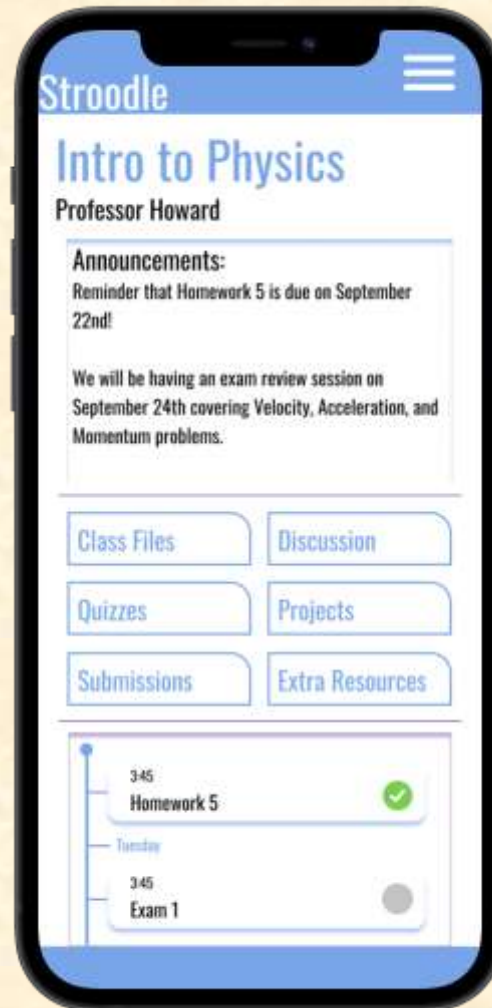
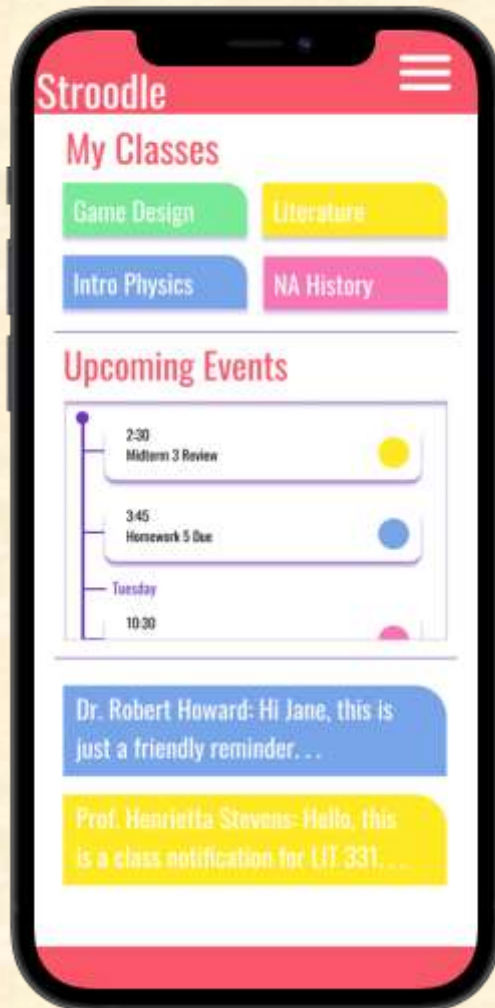


# Screen Mockup: Professor Gradebook

Course Files									
Introductory Physics									
 Robert Howard id: RHow789									
Home									
Courses									
Calendar									
Settings									
Log out									
Student	On time?	Grade	Grade	On time?	Grade	Grade	On time?	Grade	Grade
Allison, Christie	✓	95/100 95%	86/100 86%	✓	40/50 80%	5/5 100%			
Anderson, Dominick	✓	86/100 86%	92/100 92%	✓	42/50 84%	5/5 100%			
Glover, Shannon	✓	97/100 97%	91/100 91%	✗	39/50 78%	4/5 80%			
Jennings, Rudy	✗	78/100 78%	84/100 84%	✗	45/50 90%	5/5 100%			
Leonard, Joe	✓	92/100 92%	89/100 89%	✓	47/50 94%	3/5 60%			
Morris, Curtis	✓	85/100 85%	74/100 74%	✓	48/50 96%	5/5 100%			
Phelps, Zach	✓	89/100 89%	85/100 85%	✗	37/50 74%	5/5 100%			
Stokes, Stuart	✓	99/100 99%	83/100 83%	✓	45/50 90%	2/5 40%			
Ward, Mindy	✓	94/100 94%	96/100 96%	✓	38/100 76%	4/5 80%			
Willis, Alvin	✗	74/100 74%	98/100 98%	✓	34/68 68%	5/5 100%			



# Screen Mockup: Mobile App View

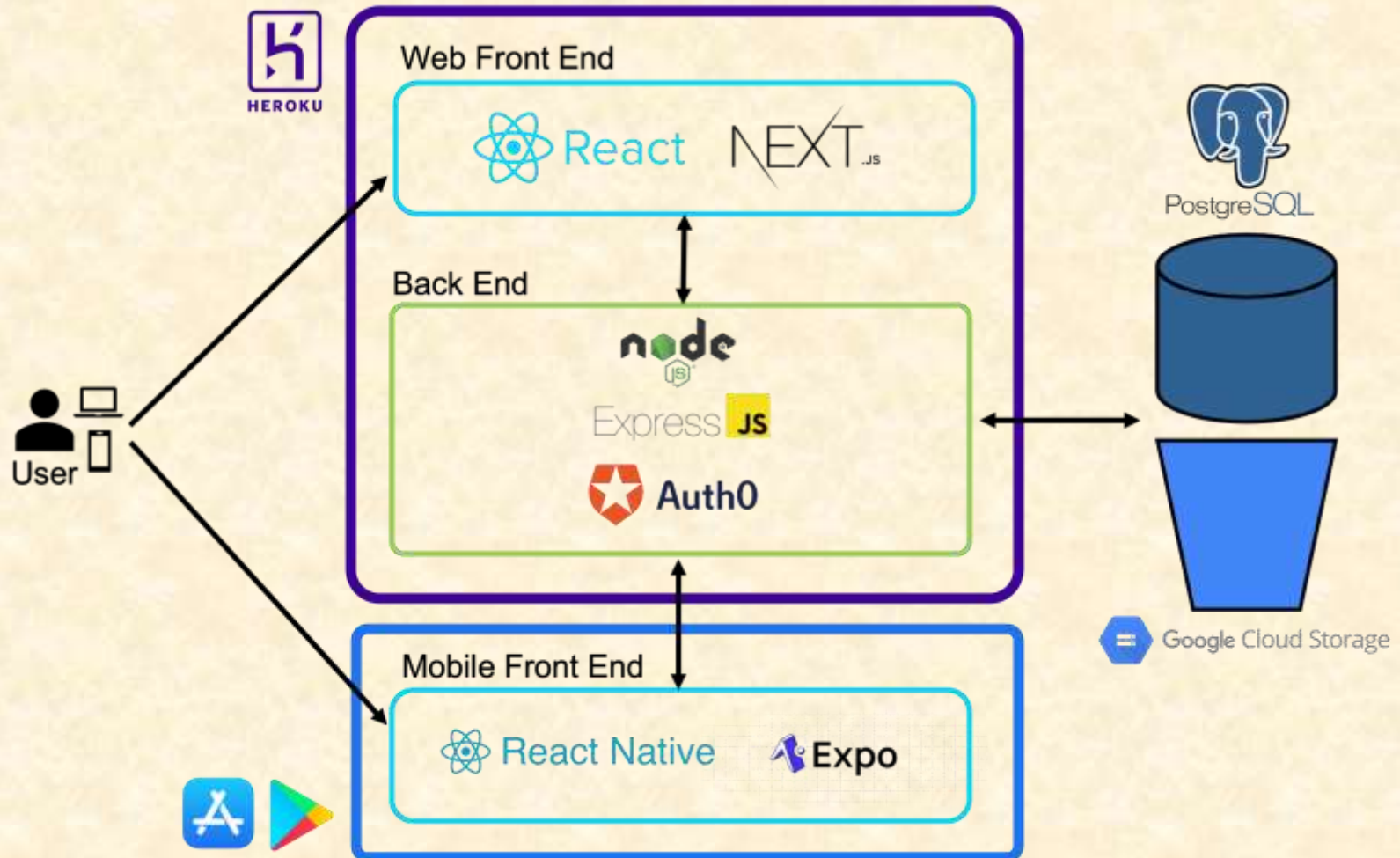


# Technical Specifications

- Both web and mobile app
  - React and React Native
- Web and mobile apps share back end
  - Node.js and Express.js
- Standard, relational database storage as well as object storage
  - PostgreSQL and Google Cloud Storage
- Cloud hosting
  - Heroku



# System Architecture



# System Components

- Hardware Platforms
  - Desktop computer
  - IOS device
  - Android device
- Software Platforms / Technologies
  - React
  - React Native
  - Next.js
  - Expo
  - Node.js
  - Express.js
  - Auth0
  - PostgreSQL
  - Google Cloud Storage
  - Google Calendar API
  - Heroku



# Risks

- Course document storage
  - Course instructors can upload files such as PDF's, Word documents, and images. These need to be stored separately from the main database and be available for download by students.
  - Object storage will be a high priority task, leaving time to resolve potential roadblocks during implementation. Resources like official documentation, third-party tutorials, and our project contacts will be utilized.
- Application permissions
  - There will be different permission types for each user, such as course instructors and students. Depending on a user's permissions, they will be able to access different types of data, perform certain actions, and go to specific views. Permissions will need to be tracked and checked carefully as to not accidentally allow users of limited permission types to perform administrative level actions.
  - A well-defined permission structure will be put in place and dependent features will be implemented around it. This way, the team will not have to go back and modify existing features to account for permissions, which could lead to code depreciation.
- Implementing administration
  - The professor will have the ability to add students to their course and will need to be able to search for the students. On the other hand, there must be a guarantee that the student will see they are enrolled in the course.
  - Ensure that the professor has the correct permission and can add students to their course by being able to search for them. It is also important that this functionality is worked on early in development to reduce issues when implementing administration.





# Questions?

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