

Requirement Specifications For Curriculum Plan

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Project Overview:

This project will involve the creation of a curriculum planner web application. An administrative user will be able to construct a degree plan page dynamically by having client-side course inputs stored in a database. Stored course requirements will include: Course ID, Course Name, Description, Minimum Grade Requirement, Credit Hours, Prerequisites, Corequisites, Term, Degree, and College. From the database, a plan will be generated. A normal user will be able to view these generated curriculum plans in three different perspectives: Degree, Grid, and Graph. All of this will be constructed using the MERN stack, which includes: MongoDB, Express, React.js, and Node.js.

MongoDB will serve as the database, Node.js will be used as the server-side language, Express is used as a framework for Node.js that provides features for web development, and React.js will be used as the client-side language.

Features:

Roles: User experience within the scope of separate qualifications.

Security: Authorization of administrative users within the web application.

Interface design by role: The user interface and design of the website depicted by mockups.

Capture user inputs: How and what data will be pulled from user input and sent to the database.

Databases: The databases used to store the course information and the administrator emails.

Complete all outputs: How the data will be pulled from the database to the user interface.

Roles:

There are two roles a user can take when interacting with the website. There is the normal/average user and the administrator. The difference between their interfaces will be covered in the later section. The main aspects of a normal user's interaction will consist of searching for a degree and viewing the degree through various means.

The main aspects of an administrator's interaction will consist of logging in, creating degrees, and adding courses.

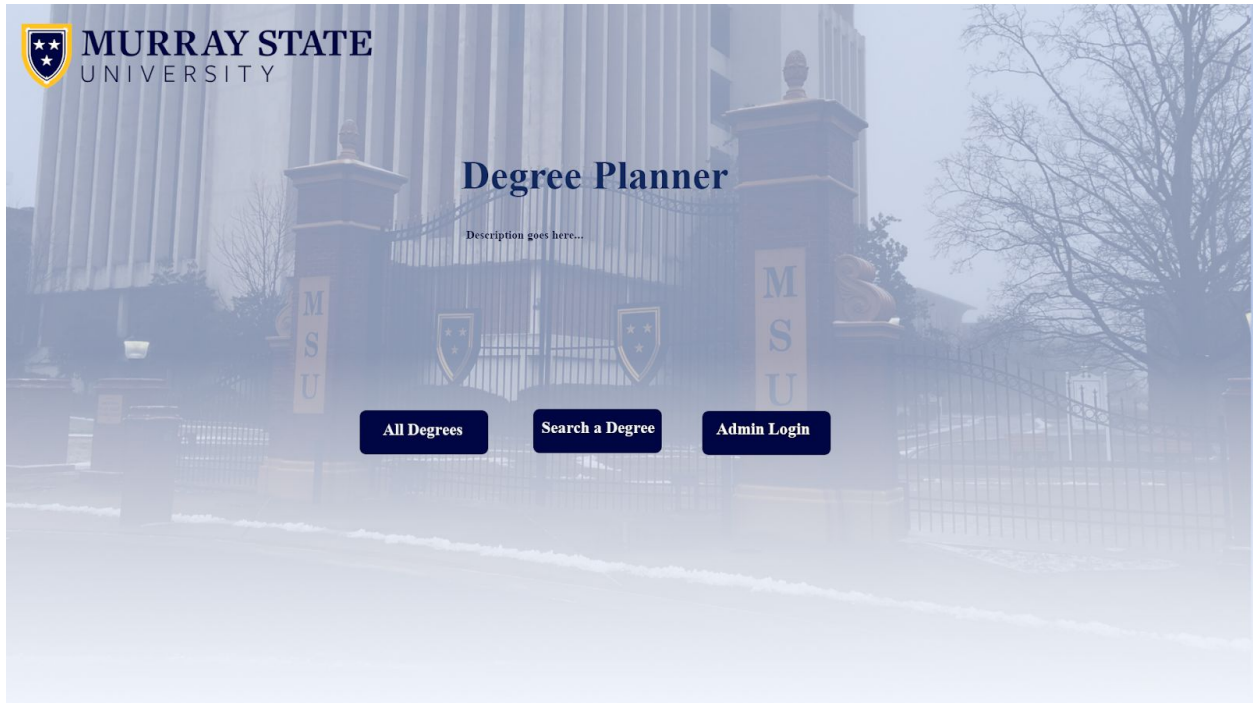
Security:

The database will not store every administrator's custom login information. Instead, login and authorization will be handled through the use of the OAuth 2.0 protocol. Since all Murray State students and personnel are given a Google email address under the murraystate.edu name, all students and personnel can have their identification verified through the use of the Google API. Through given permissions, Google can send a token of credentials that can be compared to what is stored in the database. However, this still means that the database will have to store the email of verified administrators.

OAuth 2.0 will be implemented by requesting the user's email address through the userinfo.email scope. Once a token has been sent back, the email will be requested from Google and tested against the emails stored in the database. If the test isn't passed, the user will be informed, if it is passed, the user will be sent to the next page.

Interface Design by Role:

Landing/Welcome Page -The page that all users will arrive at initially when they go to the website.

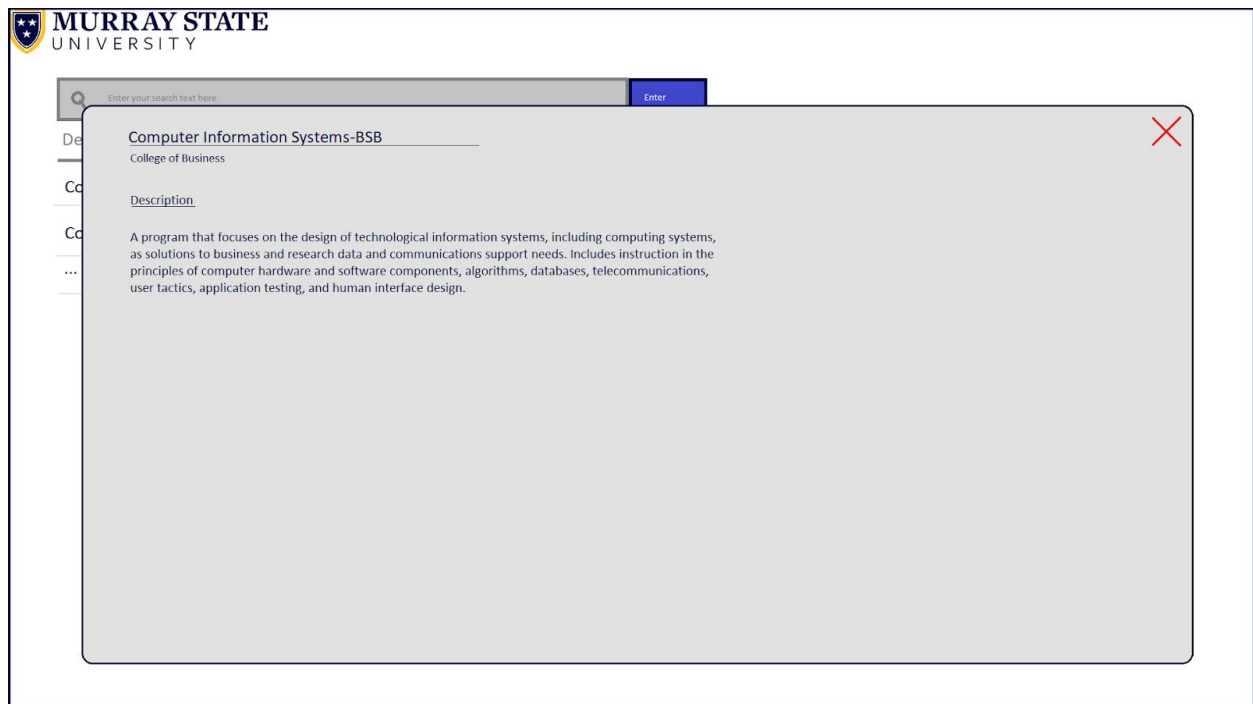


Degree List Page- Lists all the degrees the user can choose from and view degree plans of.

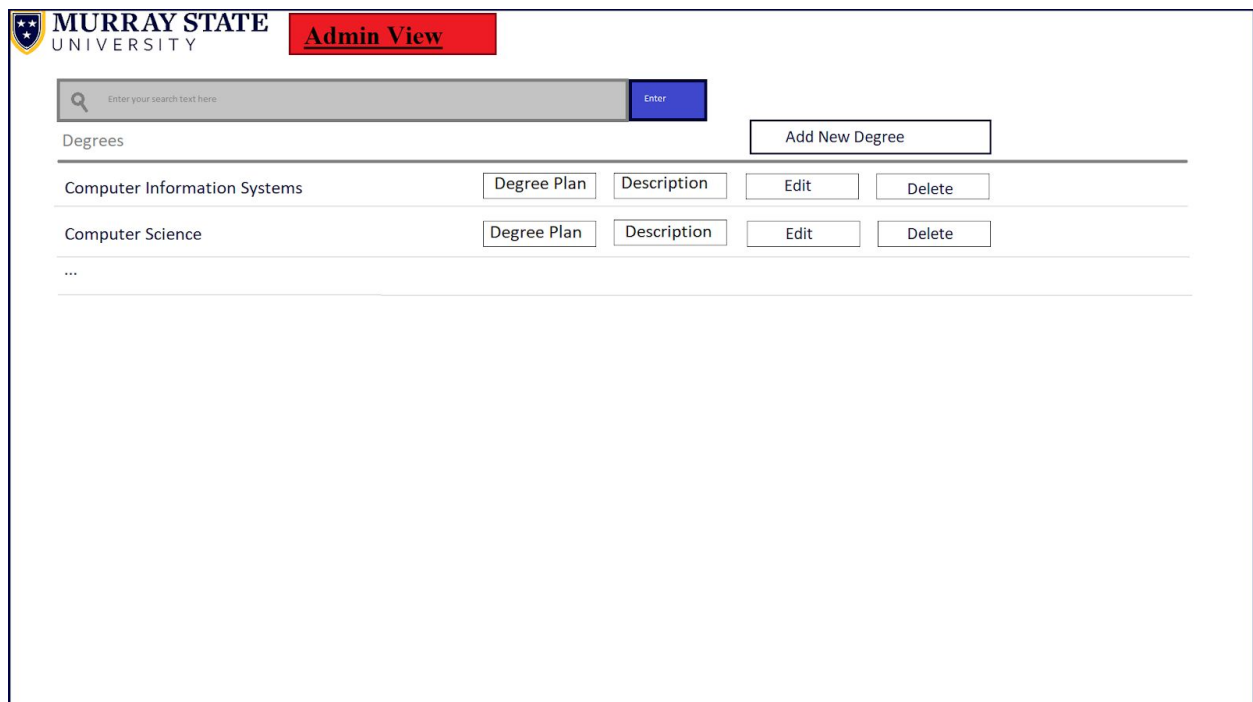
A mockup of the Murray State University Degree List Page. The page has a white background with a dark blue border. At the top left is the Murray State University logo. Below the logo is a search bar with a magnifying glass icon, the placeholder text "Enter your search text here", and a blue "Enter" button. Below the search bar is the heading "Degrees". Underneath is a table with two columns: degree names and action buttons. The first row contains "Computer Information Systems" and buttons for "Degree Plan" and "Description". The second row contains "Computer Science" and buttons for "Degree Plan" and "Description". The third row contains an ellipsis "...".

Degrees	
Computer Information Systems	Degree Plan Description
Computer Science	Degree Plan Description
...	

Degree Description Popup- Tells the user some general info about the degree itself.



Admin Degrees List Page- List of all the degrees where the administrator can edit, delete, and add new degrees on top of the functionality of the Degrees List Page for normal users.



Edit Degree Popup - Where an administrator can edit the degree name and description.

The screenshot shows the 'Edit Degree' popup window within the 'Admin View' of the Murray State University system. The popup has a title bar with a search input and an 'Enter' button. The main content area contains two text input fields: 'Degree Name' with the value 'Computer Information Systems' and 'Degree Description' with a multi-line text description. A 'Save' button is located at the bottom left of the popup. A red 'X' icon is in the top right corner of the popup window.

MURRAY STATE UNIVERSITY **Admin View**

Enter your search text here Enter

Edit Degree

Degree Name: Computer Information Systems

Degree Description: A program that focuses on the design of technological information systems, including computing systems, as solutions to business and research data and communications support needs. Includes instruction in the principles of computer hardware and software components, algorithms, databases, telecommunications, user tactics, application testing, and human interface design.

Save

Add Degree Popup - Where an administrator can create a new degree by inserting a name, description and then selecting a college from a drop down.

The screenshot shows the 'Add New Degree' popup window within the 'Admin View' of the Murray State University system. The popup has a title bar with a search input and an 'Enter' button. The main content area contains three fields: 'Degree Name' with the value 'Computer Science/Game Development-BA', 'Degree Description' with a multi-line text description, and 'Associated College' with a dropdown menu showing 'Business'. A 'Save' button is located at the bottom left of the popup. A red 'X' icon is in the top right corner of the popup window.

MURRAY STATE UNIVERSITY **Admin View**

Enter your search text here Enter

Add New Degree


Degree Name: Computer Science/Game Development-BA

Degree Description: A program that focuses on computer theory, computing problems and solutions, and the design of computer systems and user interfaces from a scientific perspective. Includes instruction in the principles of computational science, computer development and programming, and applications to a variety of end-use situations.


Associated College: Business

Save


Degree Plan Page- Where the user can go to view the list of courses he or she would need to take each term to graduate in four years.


 MURRAY STATE UNIVERSITY		Computer Informations Systems-BSB College of Business Degrees/Computer Information Systems-BSB/Degree Plan	
Degree Plan	Grid Layout	Graph Layout	
Term 1		Total Credit Hours: 15	
ENG 105 - Critical Reading, Writing, and Inquiry	Minimum Grade: C	Credit Hours: 4	
SMQ Math		Credit Hours: 4	
TSM 135 - Introduction to Network Technology	Minimum Grade: C	Credit Hours: 3	
CSC 101 - Introduction to Problem Solving Using Computers	Minimum Grade: C	Credit Hours: 3	
CSC 100T - Transitions	Minimum Grade: C	Credit Hours: 1	
Term 2		Total Credit Hours: 15	
COM 161 - Introduction to Public Speaking	Minimum Grade: C	Credit Hours: 3	
CSC 125 - Internet and Web Page Design	Minimum Grade: C	Credit Hours: 3	
HUM Elective		Credit Hours: 3	

Admin Degree Plan Page - Has all the same functionality of Degree Plan Page for normal users, but there is an additional button for the All Courses Page.

 MURRAY STATE UNIVERSITY		Computer Informations Systems-BSB College of Business Degrees/Computer Information Systems-BSB/Degree Plan	
Degree Plan	Grid Layout	Graph Layout	Admin View
Degree Plan	Grid Layout	Graph Layout	All Courses
Term 1		Total Credit Hours: 15	
ENG 105 - Critical Reading, Writing, and Inquiry	Minimum Grade: C	Credit Hours: 4	
SMQ Math		Credit Hours: 4	
TSM 135 - Introduction to Network Technology	Minimum Grade: C	Credit Hours: 3	
CSC 101 - Introduction to Problem Solving Using Computers	Minimum Grade: C	Credit Hours: 3	
CSC 100T - Transitions	Minimum Grade: C	Credit Hours: 1	
Term 2		Total Credit Hours: 15	
COM 161 - Introduction to Public Speaking	Minimum Grade: C	Credit Hours: 3	
CSC 125 - Internet and Web Page Design	Minimum Grade: C	Credit Hours: 3	
HUM Elective		Credit Hours: 3	

Grid Layout Page - Another view of all the courses by term he or she would need to take and where the user can view the prerequisites and corequisites of those courses. If a user hovers over a course it will show the prerequisite, corequisites, and courses unblocked from this course via different colors as well as a key at the bottom right depicting the meanings of each color.

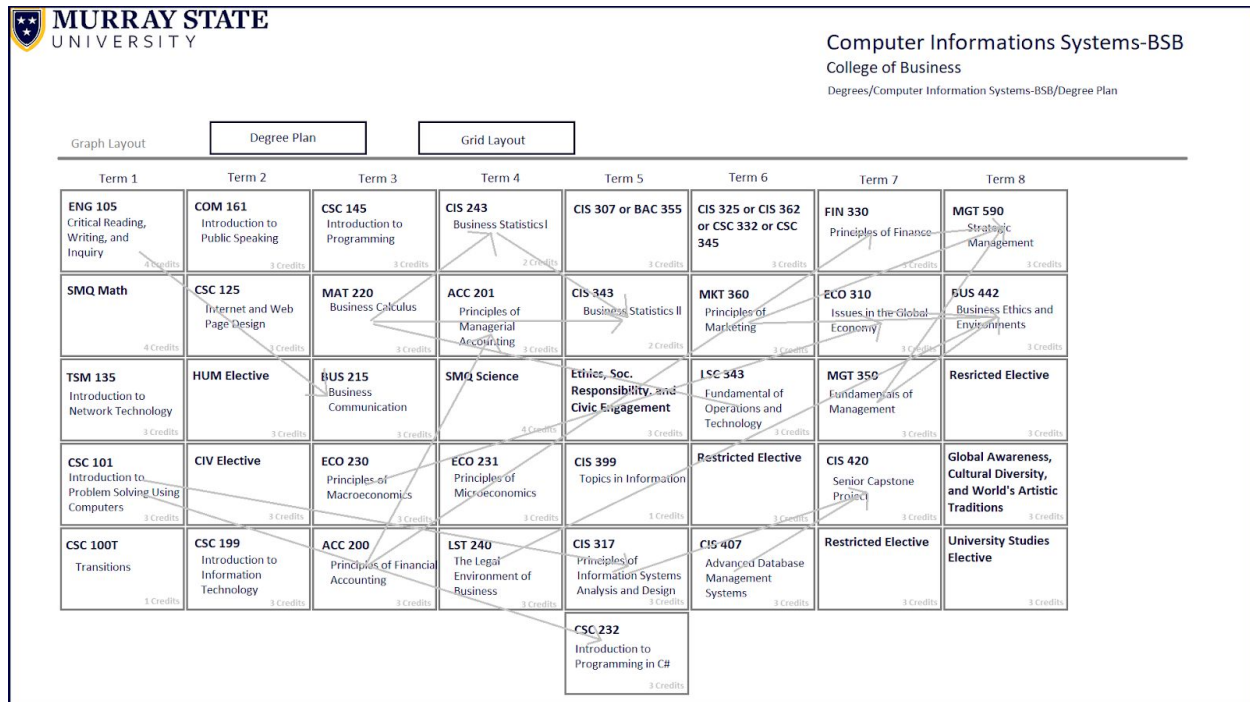
 MURRAY STATE UNIVERSITY		Computer Informations Systems-BSB College of Business Degrees/Computer Information Systems-BSB/Degree Plan					
Grid Layout		Degree Plan		Graph Layout			
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6	Term 7	Term 8
ENG 105 Critical Reading, Writing, and Inquiry 4 Credits	COM 161 Introduction to Public Speaking 3 Credits	CSC 145 Introduction to Programming 3 Credits	CIS 243 Business Statistics I 2 Credits	CIS 307 or BAC 355 3 Credits	CIS 325 or CIS 362 or CSC 332 or CSC 345 3 Credits	FIN 330 Principles of Finance 3 Credits	MGT 590 Strategic Management 3 Credits
SMQ Math 4 Credits	CSC 125 Internet and Web Page Design 3 Credits	MAT 220 Business Calculus 3 Credits	ACC 201 Principles of Managerial Accounting 3 Credits	CIS 343 Business Statistics II 2 Credits	MKT 360 Principles of Marketing 3 Credits	ECO 310 Issues in the Global Economy 3 Credits	BUS 442 Business Ethics and Environments 3 Credits
TSM 135 Introduction to Network Technology 3 Credits	HUM Elective 3 Credits	BUS 215 Business Communication 3 Credits	SMQ Science 4 Credits	Ethics, Soc. Responsibility, and Civic Engagement 3 Credits	LSC 343 Fundamental of Operations and Technology 3 Credits	MGT 350 Fundamentals of Management 3 Credits	Restricted Elective 3 Credits
CSC 101 Introduction to Problem Solving Using Computers 3 Credits	CIV Elective 3 Credits	ECO 230 Principles of Macroeconomics 3 Credits	ECO 231 Principles of Microeconomics 3 Credits	CIS 399 Topics in Information 3 Credits	Restricted Elective 3 Credits	CIS 420 Senior Capstone Project 3 Credits	Global Awareness, Cultural Diversity, and World's Artistic Traditions 3 Credits
CSC 100T Transitions 3 Credits	CSC 199 Introduction to Information Technology 3 Credits	ACC 200 Principles of Financial Accounting 3 Credits	LST 240 The Legal Environment of Business 3 Credits	CIS 317 Principles of Information Systems Analysis and Design 3 Credits	CIS 407 Advanced Database Management Systems 3 Credits	Restricted Elective 3 Credits	University Studies Elective 3 Credits
				CSC 232 Introduction to Programming in C# 3 Credits			

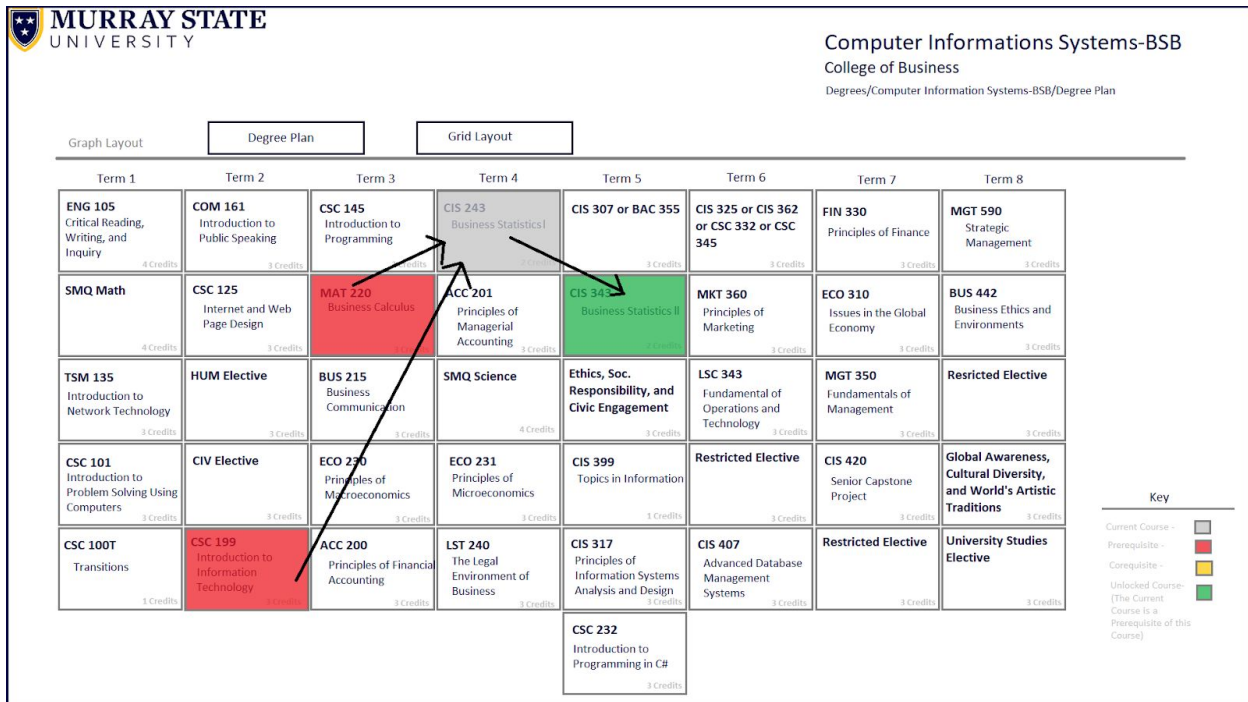
 MURRAY STATE UNIVERSITY		Computer Informations Systems-BSB College of Business Degrees/Computer Information Systems-BSB/Degree Plan					
Grid Layout		Degree Plan		Graph Layout			
Term 1	Term 2	Term 3	Term 4	Term 5	Term 6	Term 7	Term 8
ENG 105 Critical Reading, Writing, and Inquiry 4 Credits	COM 161 Introduction to Public Speaking 3 Credits	CSC 145 Introduction to Programming 3 Credits	CIS 243 Business Statistics I 2 Credits	CIS 307 or BAC 355 3 Credits	CIS 325 or CIS 362 or CSC 332 or CSC 345 3 Credits	FIN 330 Principles of Finance 3 Credits	MGT 590 Strategic Management 3 Credits
SMQ Math 4 Credits	CSC 125 Internet and Web Page Design 3 Credits	MAT 220 Business Calculus 3 Credits	ACC 201 Principles of Managerial Accounting 3 Credits	CIS 343 Business Statistics II 2 Credits	MKT 360 Principles of Marketing 3 Credits	ECO 310 Issues in the Global Economy 3 Credits	BUS 442 Business Ethics and Environments 3 Credits
TSM 135 Introduction to Network Technology 3 Credits	HUM Elective 3 Credits	BUS 215 Business Communication 3 Credits	SMQ Science 4 Credits	Ethics, Soc. Responsibility, and Civic Engagement 3 Credits	LSC 343 Fundamental of Operations and Technology 3 Credits	MGT 350 Fundamentals of Management 3 Credits	Restricted Elective 3 Credits
CSC 101 Introduction to Problem Solving Using Computers 3 Credits	CIV Elective 3 Credits	ECO 230 Principles of Macroeconomics 3 Credits	ECO 231 Principles of Microeconomics 3 Credits	CIS 399 Topics in Information 3 Credits	Restricted Elective 3 Credits	CIS 420 Senior Capstone Project 3 Credits	Global Awareness, Cultural Diversity, and World's Artistic Traditions 3 Credits
CSC 100T Transitions 3 Credits	CSC 199 Introduction to Information Technology 3 Credits	ACC 200 Principles of Financial Accounting 3 Credits	LST 240 The Legal Environment of Business 3 Credits	CIS 317 Principles of Information Systems Analysis and Design 3 Credits	CIS 407 Advanced Database Management Systems 3 Credits	Restricted Elective 3 Credits	University Studies Elective 3 Credits
				CSC 232 Introduction to Programming in C# 3 Credits			

Key

- Current Course -
- Prerequisite -
- Corequisite -
- Unlocked Course (The Current Course is a Prerequisite of this Course)

Graph Layout Page - Another view of all the courses by term he or she would need to take and where the user can view the prerequisites and corequisites of those courses. This is similar to the Grid Layout where this layout shows the same thing, but with arrows denoting the order in which classes are taken. Like the Grid layout, if a user hovers over a course it will show the prerequisite, corequisites, and courses unblocked from this course via different colors as well as a key at the bottom right depicting the meanings of each color.





All Courses Page- Shows all the courses required for the degree. Here an admin can add, edit, and delete courses. (Admin only feature).

MURRAY STATE UNIVERSITY

Admin View

Computer Informations Systems-BSB
 College of Business
 Degrees/Computer Information Systems-BSB/Degree Plan

All Courses
 Degree Plan
 Grid Layout
 Graph Layout

Add Courses

ENG 105 - Critical Reading - Writting, and Inquiry	Edit	Delete
SMQ Math	Edit	Delete
HUM Elective	Edit	Delete
CIV Elective	Edit	Delete
CSC 101 - Introduction to Problem Solving Using Computers	Edit	Delete
CSC 100T - Transitions	Edit	Delete
CSC 125 - Internet and Web Page Design	Edit	Delete
TSM 135 - Introduction to Network Technology	Edit	Delete
CSC 199 - Introduction to Information Technology	Edit	Delete
MAT 220 - Business Calculus	Edit	Delete

Add Course Popup- Allows admins to create a new course that is within the current degree.

MURRAY STATE UNIVERSITY

Admin View

Computer Informations Systems-BSB
College of Business
Degrees/Computer Information Systems-BSB/Degree Plan

Add New Course

Course ID: CIS 243

Course Name: Business Statistics I

Credit Hours: 2 Minimum Grade: C Term: 4

Prerequisites: MAT 220 - Business Calculus
CSC 199 - Introduction to Information Technology Add

Corequisites: Choose a Corequisite Add

Description: CIS 243 Business Statistics I (2). Statistical techniques used in analyzing and solving problems encountered in a business environment. Techniques include organizing and presenting statistical data, descriptive statistical analysis, probability distributions for discrete and binomial random variables, normal probability distribution, and simple random sampling. Techniques are applied to practical business problems using appropriate computer resources.

Save All

MAT 220 - Business Calculus Edit Delete

Edit Course Popup- Allows admins to edit data of pre-existing courses within a degree.

MURRAY STATE UNIVERSITY

Admin View

Computer Informations Systems-BSB
College of Business
Degrees/Computer Information Systems-BSB/Degree Plan

Edit Course

Course ID: CIS 243

Course Name: Business Statistics I

Credit Hours: 2 Minimum Grade: C Term: 4

Prerequisites: MAT 220 - Business Calculus
CSC 199 - Introduction to Information Technology Add

Corequisites: Choose a Corequisite Add

Description: CIS 243 Business Statistics I (2). Statistical techniques used in analyzing and solving problems encountered in a business environment. Techniques include organizing and presenting statistical data, descriptive statistical analysis, probability distributions for discrete and binomial random variables, normal probability distribution, and simple random sampling. Techniques are applied to practical business problems using appropriate computer resources.

Save All Changes

MAT 220 - Business Calculus Edit Delete

Capture user inputs:

On the website, the only source of user input will be from Admins who choose to add, edit, or delete data. This data includes Colleges, Degrees, and Courses. The way it will work is React.js is the front end that creates the fields in which the data is entered. From there Node.js acts as a middle man and pulls the data from the fields and confirms that the data is a valid input. Afterward, Node.js sends off the data to the connected database.

Database:

Using MongoDB, we are going to create a collection of Course documents. A course document will include the following field:

- Course ID: The ID of the course (i.e. CSC 145)
- Course Name (i.e. Intro to Programming)
- Description: a brief description of the course
- Minimum Grade Requirement
- Credit Hours: the number of credit hours the course is worth
- Prerequisites: All of the courses required to take before the course
- Corequisites: Any courses required to take with the course
- Term: Which term this course will be taken
- Degree: The degree this course is for
- College: What college the course is a part of.

For the Administrator role, we are also going to create a collection of documents storing Admin info. An administrator document will include the following fields:

- Name: Name of the administrator
- Email: Administrator's email address

Complete All Desired Outputs:

Our User Interface will be created using React.js. Whenever an operation is performed to pull information from the MongoDB database, such as clicking on a desired course, Node.js will send the information to the User Interface. In Grid View, when you highlight a course, the database will be scanned for prerequisites and corequisites to be highlighted. In the Graph View, this same method will be used to dynamically create arrows to show the connections between courses.