

Implementation Project

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Abstract

This document will outline the software development life cycle of a website that will connect to a database in order to store and retrieve BTEC student information for Gower College Swansea. The system will be developed with MySQL which offers a free community edition housing enough features to support this system. For the front-end, I will use JavaScript and many of its useful plugins to manipulate the DOM and CSS for styling. For the back-end I will be using PHP to communicate to the database and web server due to its popularity, compatibility and open-source nature.

The document will show all of the steps taken within the analysis and database design stages including a data dictionary, entity relationship diagrams and normalisation. The website design stage will include a sitemap with attached page wireframes, user flowcharts and any pseudocode in preparation for the implementation phase of development.

Project Scope

Objectives

From information gathered from the lecturers at Gower College Swansea, the new system should perform the following tasks in order to progress to the implementation stage;

- The database must have the ability to connect to the existing moodle database containing unit, lecturer and student information.
- The lecturers can log in and get detailed information on the progress of students.
- Students can log in and track their own progress.
- Show the current grade of a student at a glance.
- Show the criteria the student has achieved for each unit.
- Have a centralized location for lecturers to contribute and observe.
- Have a way for lecturers to add Assignments with verification from co-ordinators.
- There could be an option to move or remove students should they change class or leave the course.

Assumptions

The following assumptions are made in respect to the systems functionality and design as per the objectives listed above;

- The demonstration database will be test data entered by the developer, myself.
- GCS has the web hosting capability.
- GCS has the database storage for every students assignments.
- The user will be displaying the web application on a desktop computer or laptop.

Limitations

The limitations to this project are split between the limits of the developer, myself, and the limits of the client, Gower College Swansea. As the developer I am limited by the time constraint applied by the client which states the project should be finished by May 2019. I am also limited by the skills and knowledge I have as a developer.

The client is limited by their infrastructure, the system must be available to the computers within the college. This brings security issues with GDPR and making sure the connection is secured with SSL Encryption to protect the data at all times.

Literature Review

The following literature review takes into account the project scope designed by myself and expands upon my knowledge of best practice when designing a website. Protecting private data is a fundamental part of web design and so researching data protection laws and technologies is critical. Selecting an appropriate development methodology is essential to completing the project in a reasonable timeframe whilst achieving the objectives stated.

GDPR

The European Union replaced the Data Protection Act (DPA) with the General Data Protection Regulation (GDPR) in 2018. The changes were made to fit the ever-growing technological age by bringing new laws and obligations related to personal data, privacy and consent for Europe. It affects what information can be legally stored and used by businesses and organisations. In order to comply with GDPR, organisations are legally bound to ensure personal data is collected fairly and in full consent of the individual. Those who collect this data are also required to protect it from those who wish to exploit it and will face legal penalties if they fail to do so [1].

This project will be making use of student and lecturer personal information and thus it is important to comply with GDPR, I will make sure to protect the data that I use to avoid exploitation.

SSL Encryption

Digicert - *“Secure Socket Layer (SSL) is a standard security technology for establishing an encrypted link between a server and client - typically a web server (website) and a browser, or a mail server and a mail client (e.g. Outlook)”* [2].

SSL Encryption is technology for establishing a secure connection on the web, it is essential for businesses who provide e-commerce in their websites in addition to websites that protect important information such as online banking and educational websites.

Development Methodologies

Waterfall

Andrew Powell-Morse *“The waterfall model emphasizes that a logical progression of steps be taken throughout the software development life cycle (SDLC), much like the cascading steps down an incremental waterfall”* [3].

The waterfall method is the traditional method for creating software, it is rigid and requires you to 100% complete a stage before moving on to the next. It benefits from having a stable set of requirements given to you with rare opportunity to go back to a previous stage and make changes. This method is excellent for creating a finished product within a strict time frame but fails when it comes to projects that may require maintenance and additional features.

Agile

Synopsys Editorial Team - *“Agile methods attempt to minimize risk (such as bugs, cost overruns, and changing requirements) when adding new functionality by developing the software in iterations that are mini-increments of the new functionality.”* [4].

The agile development methodology comes in many forms but they all follow the same principle which is developing iterations and receiving real-time feedback from the end user contributing to the next development cycle. Although this can identify problems and design flaws earlier it can make the system more difficult to use because there is an ever changing documentation.

Requirement Specification

Existing System

Gower College Swansea is a public college in Swansea, it offers many courses to a wide range of ages. Notably it offers a large amount of BTEC courses for students aged 16+. Currently GCS uses Moodle, a learning platform, in order to interact with their students and provide

learning material online. The lecturers mark and maintain students progress manually and individually using spreadsheets while the students are left without a way to see their progress online.

The lecturers at Gower College Swansea are unhappy with the current system they use to manage and mark BTEC students' work. Currently for each assignment released they create an excel workbook and then create a separate sheet for each student denoting what criteria they have achieved (see Appendix B.1). Using this system it is difficult to track what criteria has been met across all assignments within a module and consequently it is problematic to track what grade the student has currently achieved. Given the large amount of modules and assignments within those modules this file structure is unsustainable and has a large margin for mistakes. Lecturers who would like to find out the progress of a specific student must filter through their files to find the spreadsheets containing that student and then manually add up the target criteria they have achieved thus calculating their grade. The current system makes it difficult to communicate progress between units taught by different lecturers and aggregating data and the end of their tenure.

In order to increase the chances of success within the new system, I conducted some interviews (see Appendix C) with users of the current system. Their overwhelming response was that the current system for tracking students and providing feedback was very time consuming and could be improved on immensely. From these interviews I crafted a questionnaire to identify which features were imperative to the success of the new system (see Appendix B.3).

I have chosen to use the waterfall methodology because it's what the client would prefer to use. A smooth transition between the old system and the new system is imperative, therefore running through the waterfall methodology to completion ensures the most complete product. This goes against my personal preference which leans towards an Agile approach using iteration.

System Requirements

Operational Requirements

In order to succeed the system needs to:

- Track students progress on 3 levels: overall course grade, module target criteria, assignment target criteria.
- Provide a way to add assignments.
- Provide a way to add new courses.
- Show upcoming assignment deadlines on a calendar.
- Provide quick access to student information.
- Provide a search bar for courses, tutor groups, students, modules and assignments.
- Calculate grades based on the BTEC points system.
- Provide a way to register accounts and link them to lecturers/students

Information Requirements

The information provided from the students will be available to all lecturers at Gower College Swansea allowing for easy access. The data will be displayed in real time and should be updated by the users upon assignment deadlines. The data collected will be used to track what target criteria students have achieved, what grade students have achieved and upcoming assignment deadlines. Personal data such as full name, address and medical details will be kept at a minimum as the system does not require it.

General System Requirements

The data entered into the system will be heavily controlled with validation to prevent errors, small errors with the tracking can lead to larger problems when aggregating data at the end. Any mistakes that are entered will be editable by a coordinator if necessary.

Evaluation Criteria

In order for this system to be a success the end user must feel comfortable replacing their current spreadsheet system with this new centralized system. The pages must feel responsive and navigation must flow comfortably. The system must satisfy the objectives stated in the project scope while complying to GDPR.

Future plans

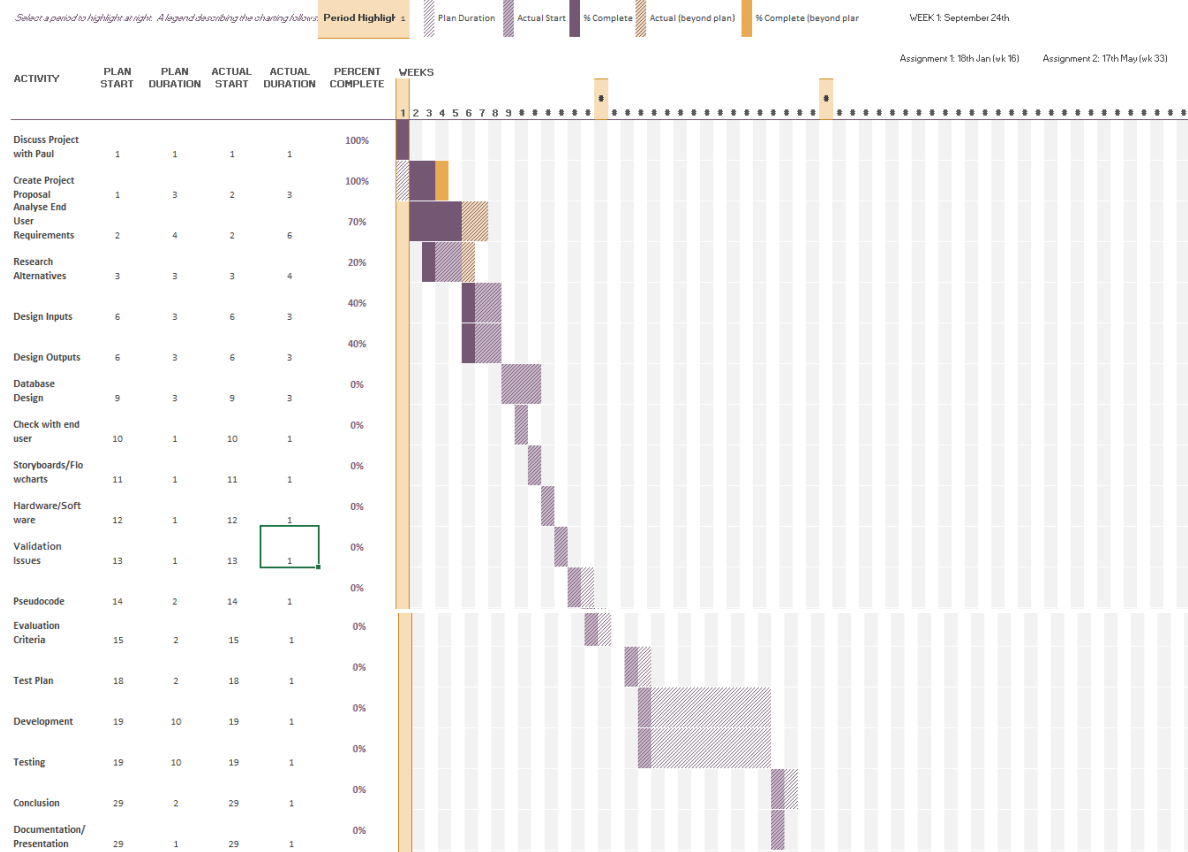
This section outlines useful features that do not fit within the time constraints provided:

- The ability to import data from moodle such as: student login data, course information and unit information.
- Offer a generated feedback form for assignments.
- Data aggregation into a form that is submittable to Pearson, the examining body.

Gantt Plan

Implementation Project : BTEC Student Tracker

Select a period to highlight at right. A legend describing the charting follows:



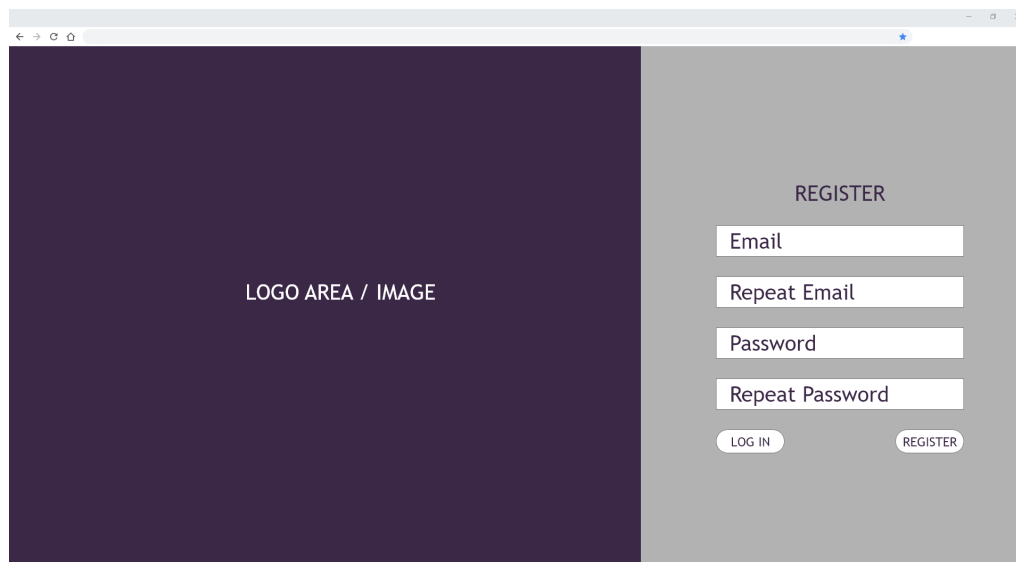
System Design Specification

Web Page Design

The pages below were designed using Adobe XD, a vector-based tool for designing web pages for web and mobile. I chose this program because i'm familiar with Adobe Photoshop and it specializes in creating basic web page prototypes.

Register Form

The register screen features a large area to display a promotional image of GCS or just a simple logo and text. Tab stops should be used to navigate through the form with ease. The email field needs to be validated to ensure it is an valid educational email address (ends in .ac.uk or .edu) and the password field must be masked. The login button will take the user to the login page and the register button will validate the fields to check the emails match and the passwords match then the password will be encrypted and the user will be added to the database. Pseudocode can be found for this page in Appendix D.1.



REGISTER

Email

Repeat Email

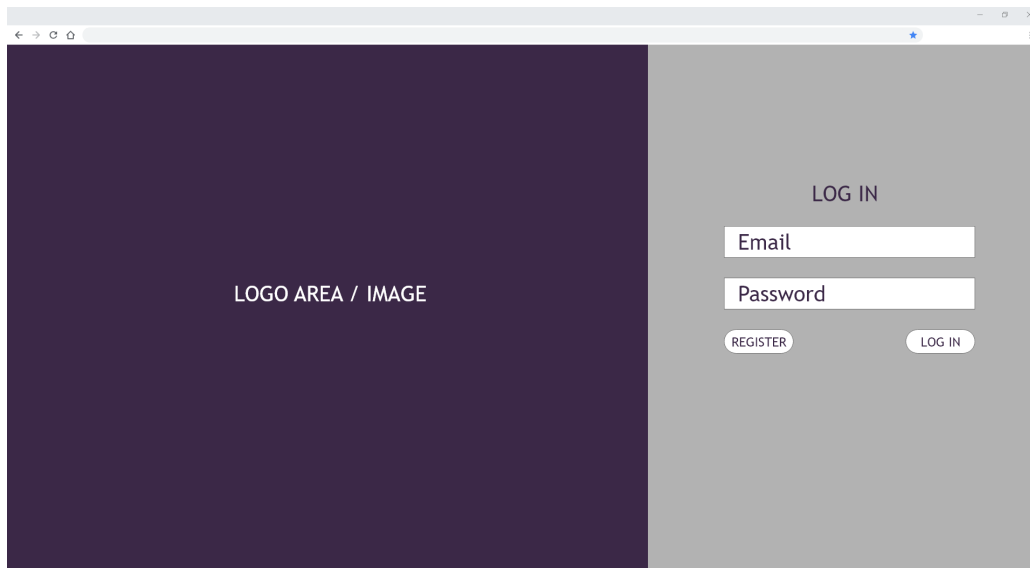
Password

Repeat Password

LOG IN REGISTER

Login Form

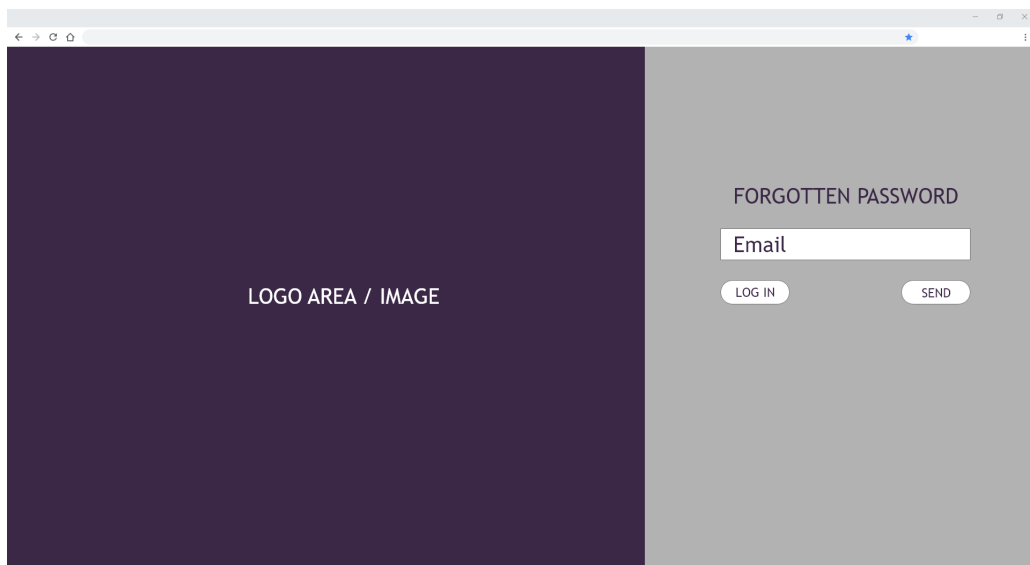
The login screen features a large area to display a promotional image of GCS or just a simple logo and text. Tab stops should be used to navigate through the form with ease. The email field needs to be validated to ensure it is a valid educational email and the password field needs to be masked. The register button will take the user to the register page and the login button will check the database for the email and validate the password is correct by decrypting it and verifying they match. Pseudocode for this page can be found in Appendix D.2.



A browser window mockup showing a login form. The left side is a dark purple rectangle labeled "LOGO AREA / IMAGE". The right side is a light gray rectangle. At the top of the gray area is the text "LOG IN". Below it are two white input fields: "Email" and "Password". At the bottom of the gray area are two white buttons: "REGISTER" and "LOG IN".

Forgotten Password Form

The forgotten password screen features a large area to display a promotional image of GCS or just a simple logo and text. The user will be required to enter a valid email address. The login button will take the user back to the login screen and the send button will check the database for if the email exists. If the email exists a password recovery email will be sent to that email and a token will be created in the database. Pseudocode for this page can be found in Appendix D.3.



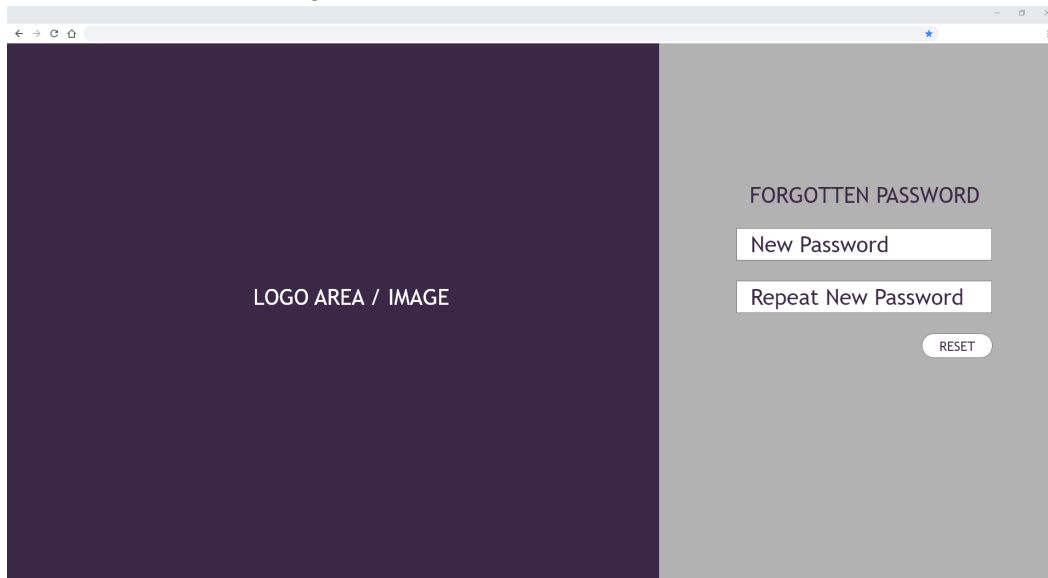
A browser window mockup showing a forgotten password form. The left side is a dark purple rectangle labeled "LOGO AREA / IMAGE". The right side is a light gray rectangle. At the top of the gray area is the text "FORGOTTEN PASSWORD". Below it is a white input field labeled "Email". At the bottom of the gray area are two white buttons: "LOG IN" and "SEND".

Password Recovery Form

The password recovery screen features a large area to display a promotional image of GCS or just a simple logo and text. Tab stops should be used to navigate through the form with ease.

The password fields will need to be masked and once the reset button is clicked the validation will check the passwords match, encrypt the password and then update the database.

Pseudocode for this page can be found in Appendix D.4.



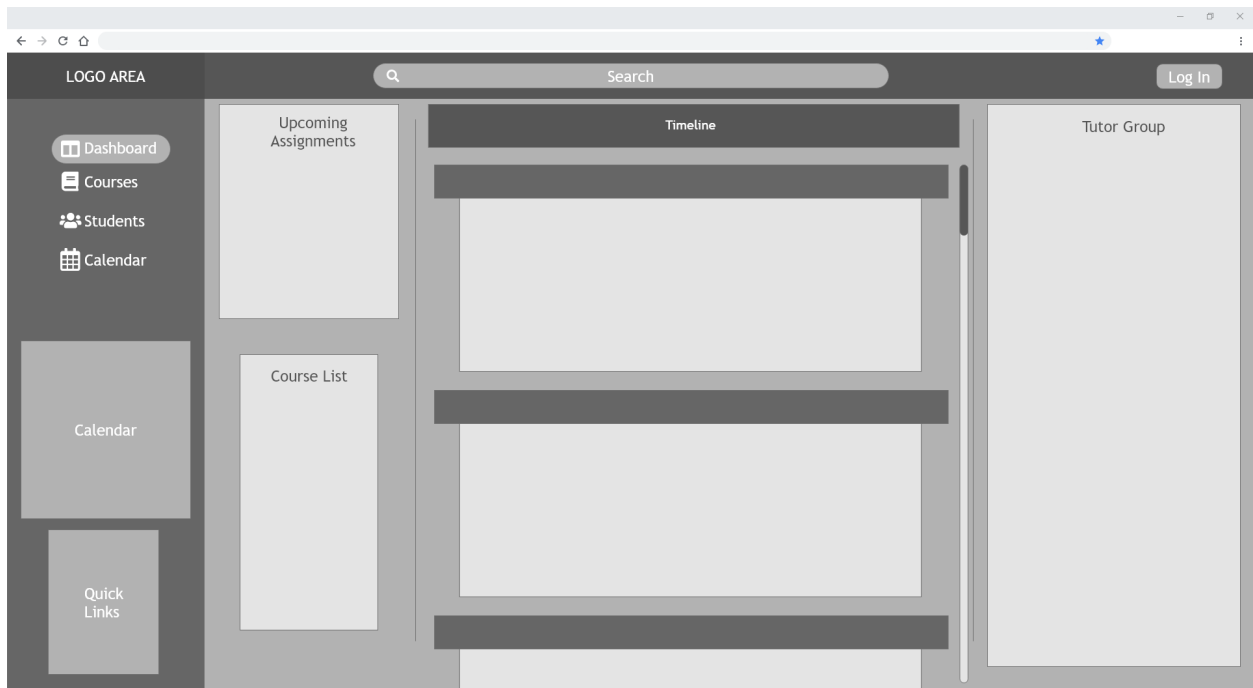
The image shows a web browser window with a 'FORGOTTEN PASSWORD' form. The form is divided into two main sections. The left section is a dark purple rectangle labeled 'LOGO AREA / IMAGE'. The right section is a light gray rectangle. Inside the right section, the text 'FORGOTTEN PASSWORD' is displayed. Below this text are two text input fields: 'New Password' and 'Repeat New Password'. At the bottom right of the right section is a button labeled 'RESET'.

All pages

After logging in these features will appear on all pages. The top of the page will feature the login/logout button and a persistent search bar capable of searching for assignments, units, courses and students. The left of the page will feature the side navigation area which comes in two forms, a detailed view with a small calendar and quick links and a compressed view showing just icons which gives more screen real estate for the main content.

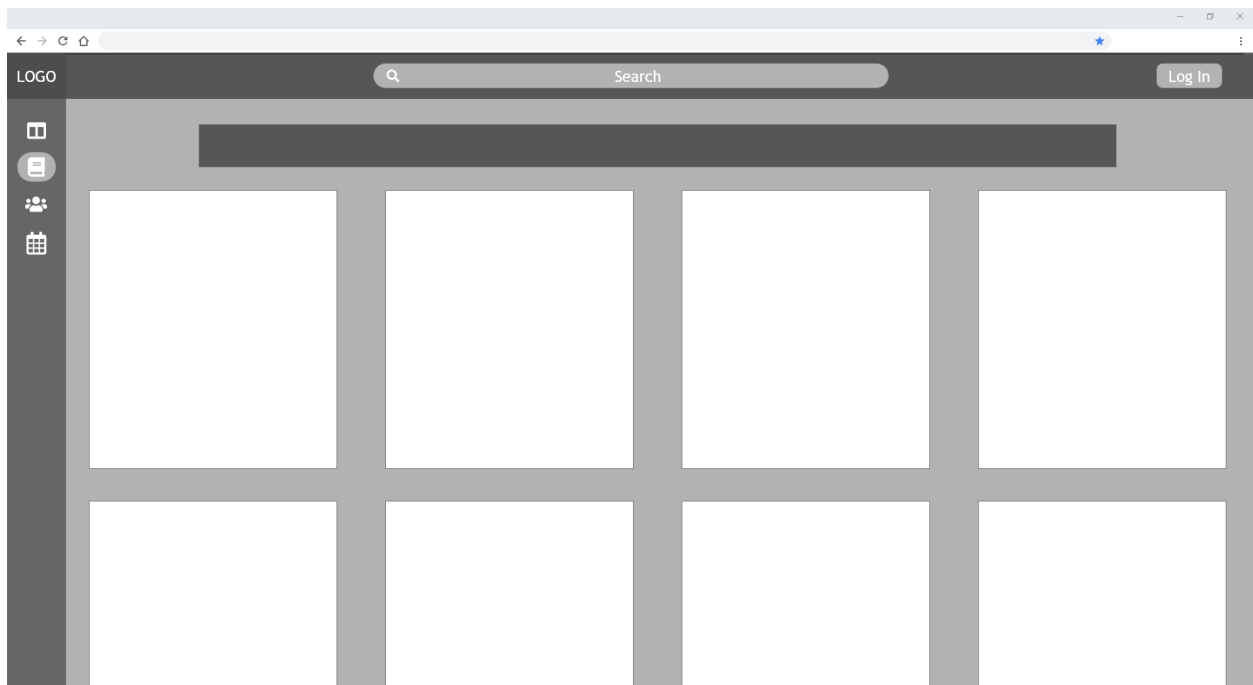
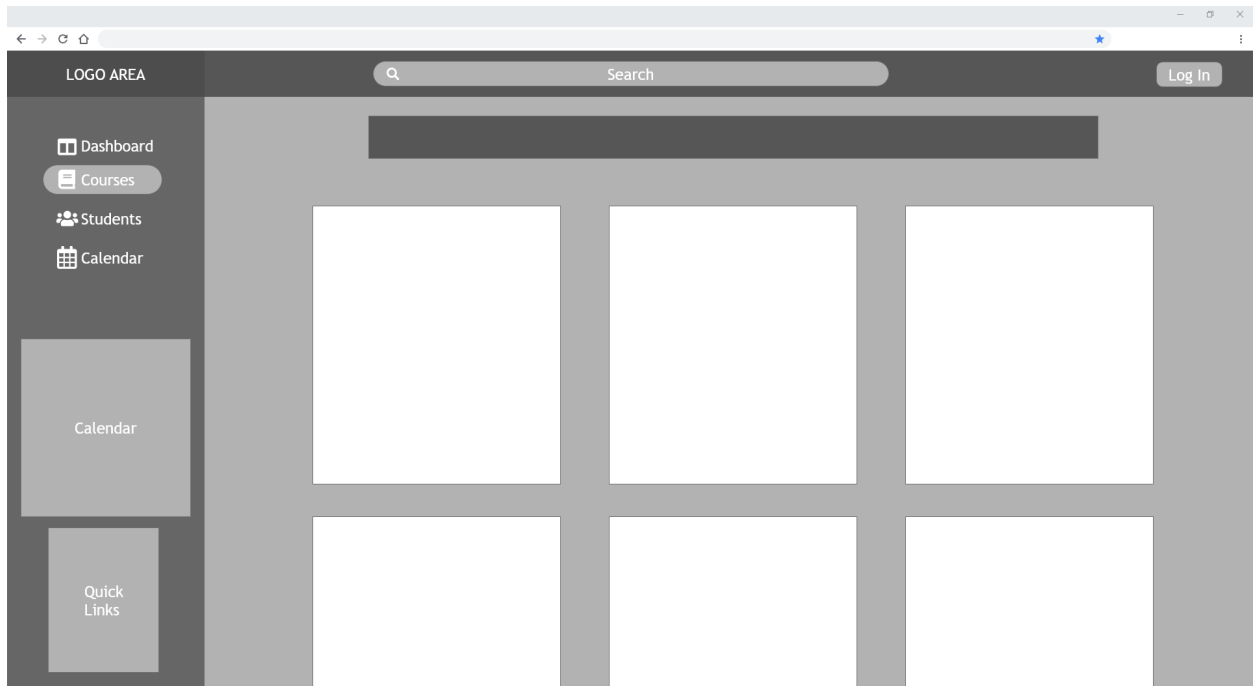
Dashboard

Upon logging into the website the user will be greeted with the dashboard, a centralized place tailored to the user. The right side of the main content will feature quick access to all of the students in the lecturers tutor group. The center of the main content will feature a timeline of events that relate to students, units, assignments and courses the lecturer is assigned to. The left of the main content will feature a list of upcoming assignments and a list of courses the lecturer teaches. Pseudocode for this page can be found in Appendix D.5.



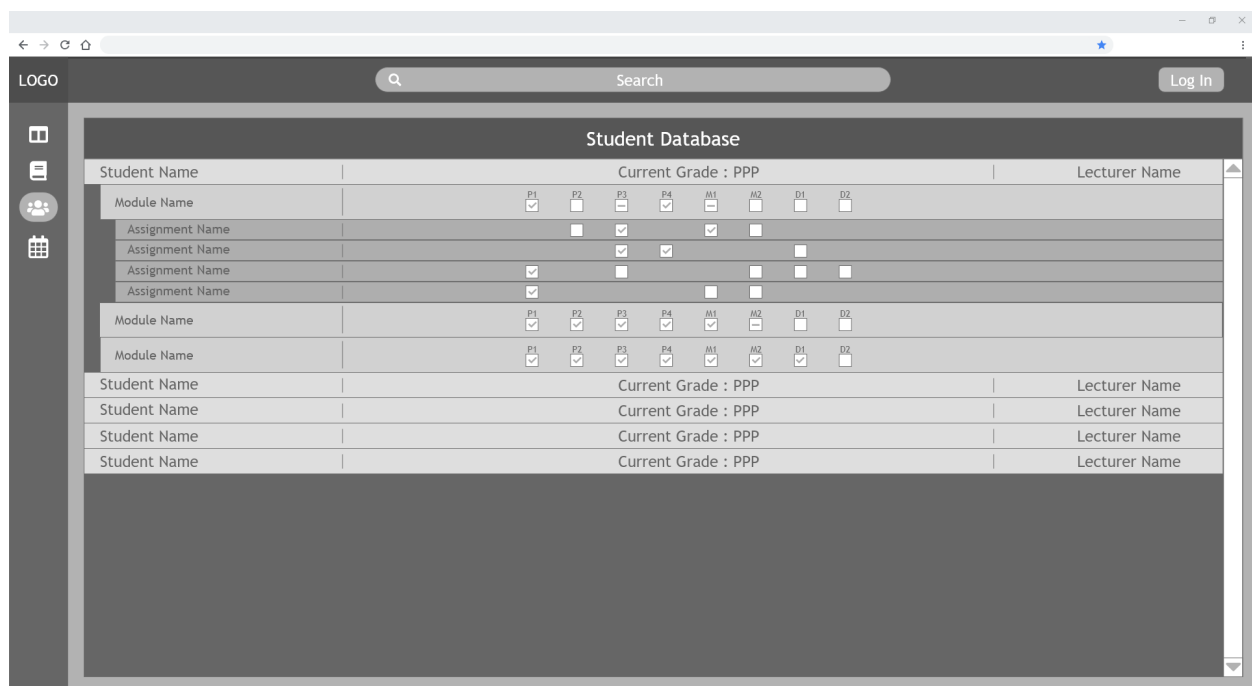
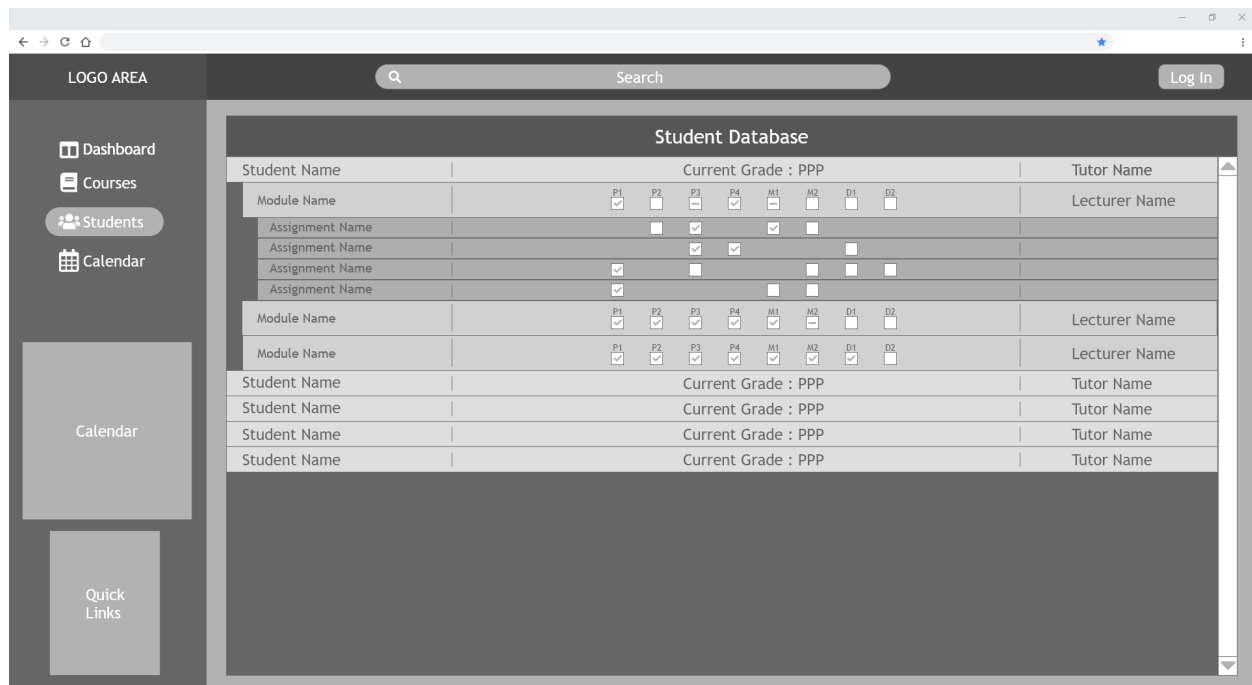
Courses

The courses page will feature a large area filled with cards that reference courses offered by GCS, clicking on a card will reveal detailed information about that course including the units and qualification level it offers. Pseudocode for this page can be found in Appendix D.6.



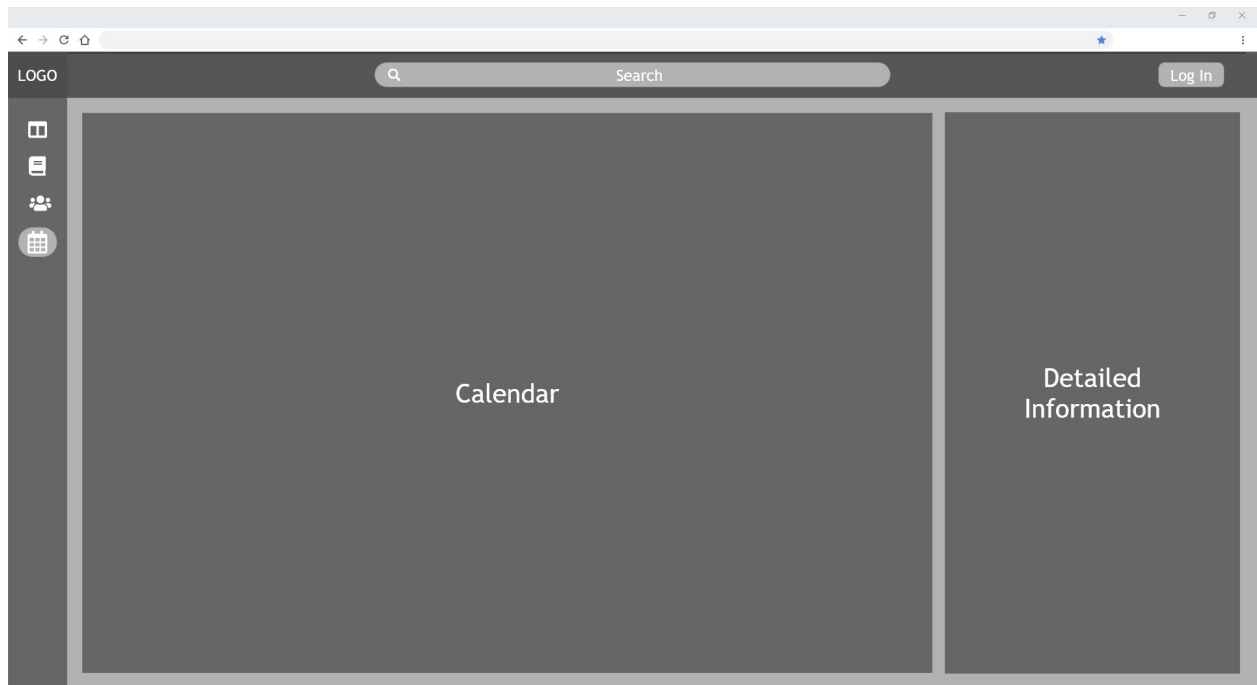
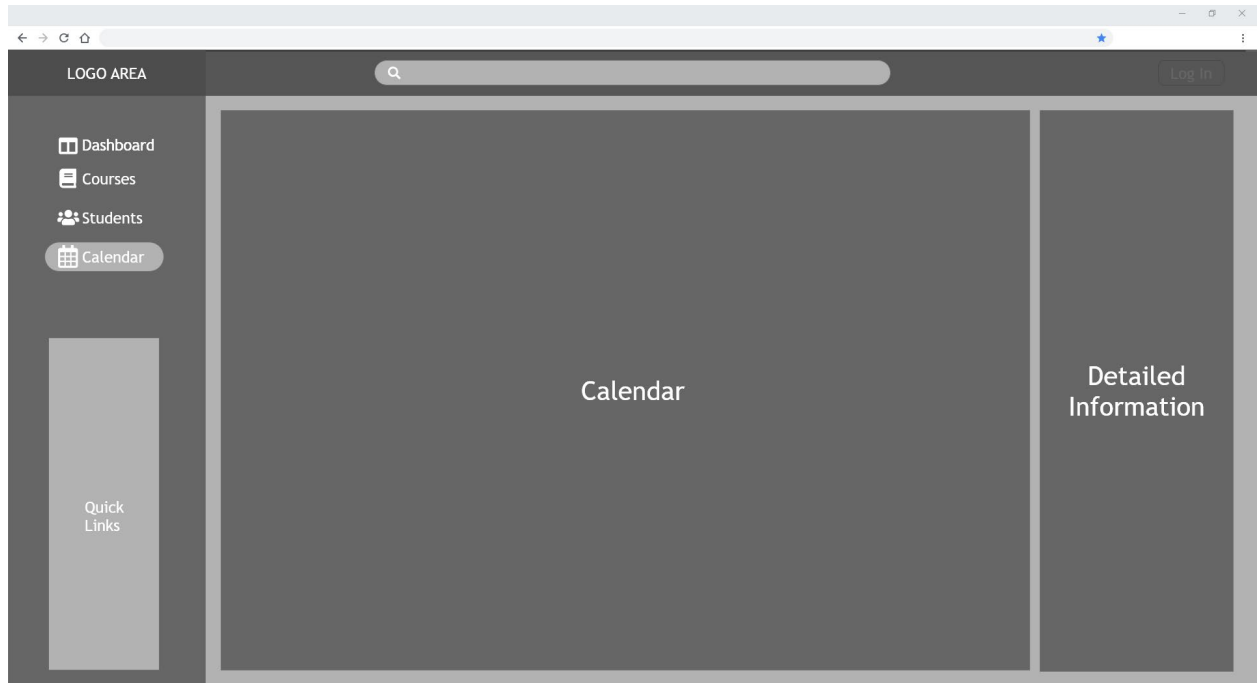
Students

The students page is the most important page of the website, inside the main content there is a data grid containing all students. Upon first glance the data grid will show the students name, current grade and who their tutor is. If you click on a student it will reveal a list of units they are doing, what criteria they have achieved for each unit and what lecturer is teaching the unit. If you click on a unit it will reveal a list of assignments for that unit, the target criteria for each assignment is shown and if the lecturer who is logged in is teaching that unit they may edit what target criteria has been achieved via a checkbox. Any edits are sent to the database and updated. Pseudocode for this page can be found in Appendix D.7.



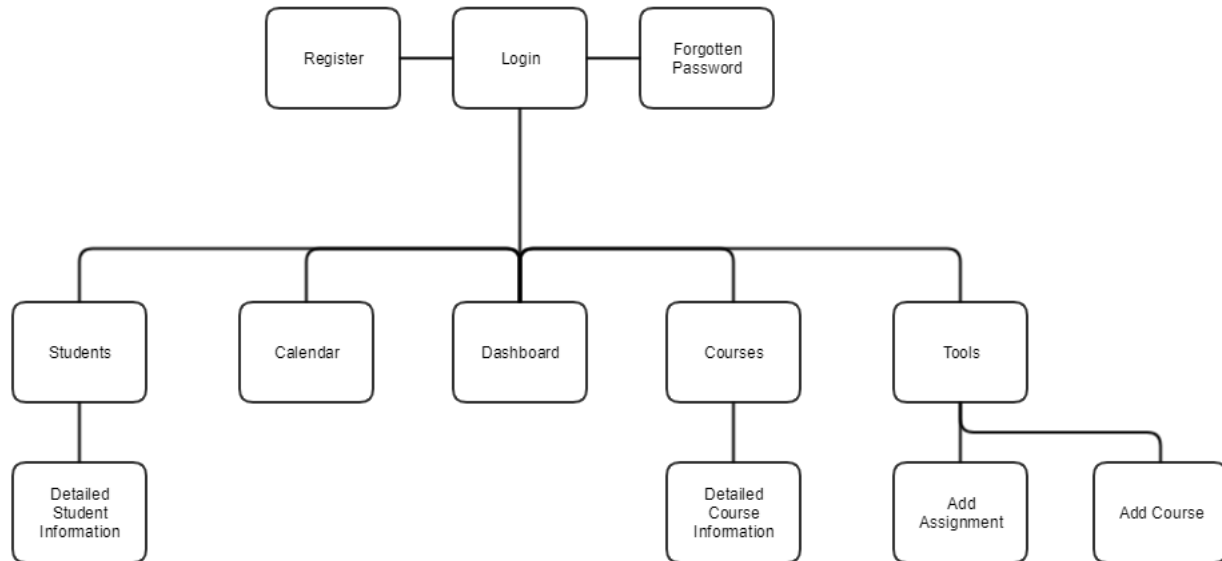
Calendar

The calendar page displays a large calendar in the main content on the page with a section on the right dedicated to providing information on the date the user has clicked on. The calendar will be populated with upcoming assignments and should have the capability to add personal reminders.



Sitemap

Using the websites side navigation bar you're always within 2 clicks of where you'd like to be, coupled with quick navigation links on each page the user experience of navigation on the website should be excellent.

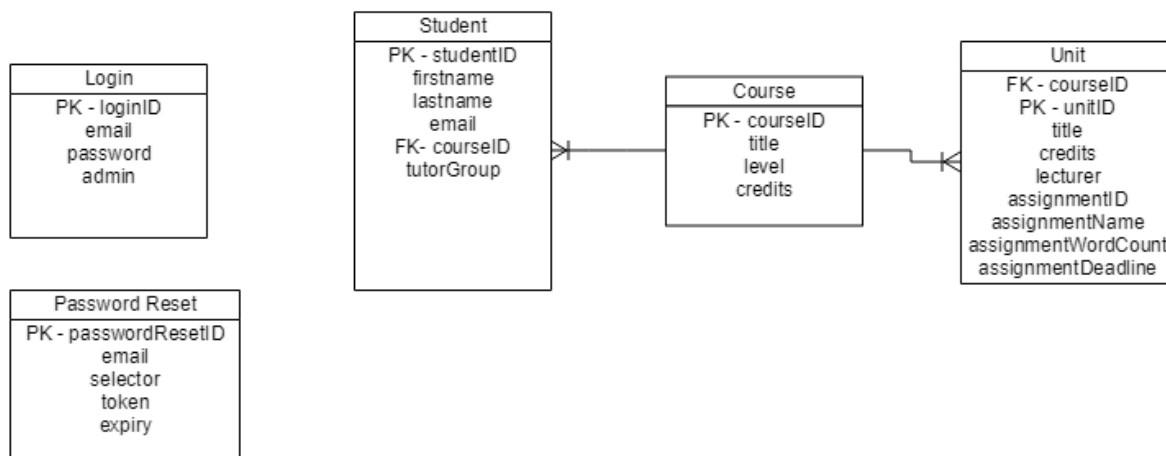


Database Design

This section shows the design phase of the database. Firstly the initial entity-relationship diagram is shown as a proof of concept, it then goes through the normalization process to avoid unnecessarily duplicating information throughout the database. Lastly the final entity-relationship diagram is shown, this is the design that the database will be built upon.

Initial ERD

The initial entity-relationship diagram shows how the database begins to connect with the students enrolling on a course indicated by a many-to-one relationship and a course containing many units denoting a one-to-many relationship. The login and password reset information are kept safe in a separate table.



Normalization

Normalization is an important technique which reorganizes tables so that there is less data dependency, data redundancy and unnecessary data duplication. At its base level you split large tables into smaller ones and link them together using relationships. The initial ERD is in first normal form [5].

PRIMARY KEY - An underline represents a primary key.

FOREIGN KEY - An overline represents a foreign key.

1st Normal Form

In order for an ERD to satisfy 1st Normal Form, each field must contain only one value and each record must be unique.

LOGIN (loginID, email, password, admin)

PASSWORD_RESET (passwordResetID, email, selector, token, expiry)

STUDENT (studentID, firstname, lastname, email, courseID, tutorGroup)

COURSE (courseID, title, level, credits)

UNIT (courseID, unitID, title, credits, lecturer, assignmentID, assignmentName, assignmentWordCount, assignmentDeadline)

2nd Normal Form

In order for an ERD to satisfy 2nd Normal Form, it must first be in 1st Normal Form and then any partial dependency must be removed.

LOGIN (loginID, email, password, admin)

PASSWORD_RESET (passwordResetID, email, selector, token, expiry)

STUDENT (studentID, firstname, lastname, email, courseID, tutorGroupID)

TUTOR_GROUP (tutorGroupID, name, lecturerID)

LECTURER (lecturerID, firstname, lastname, email, coordinator)

COURSE (courseID, title, level, credits, description)

UNIT (courseID, unitID, title, credits, description)

ASSIGNMENT (unitID, assignmentID, title, wordcount, deadline)

3rd Normal Form

In order for an ERD to satisfy 3rd Normal form, it must first be in 2nd Normal Form and then any transitive dependency must be removed.

LOGIN (loginID, email, password, admin)

PASSWORD_RESET (passwordResetID, email, selector, token, expiry)

STUDENT (studentID, firstname, lastname, email, courseID, tutorGroupID)

TUTOR_GROUP (tutorGroupID, name, lecturerID)

LECTURER (lecturerID, firstname, lastname, email, coordinator)

COURSE (courseID, title, level, credits)

UNIT (courseID, unitID, title, credits)

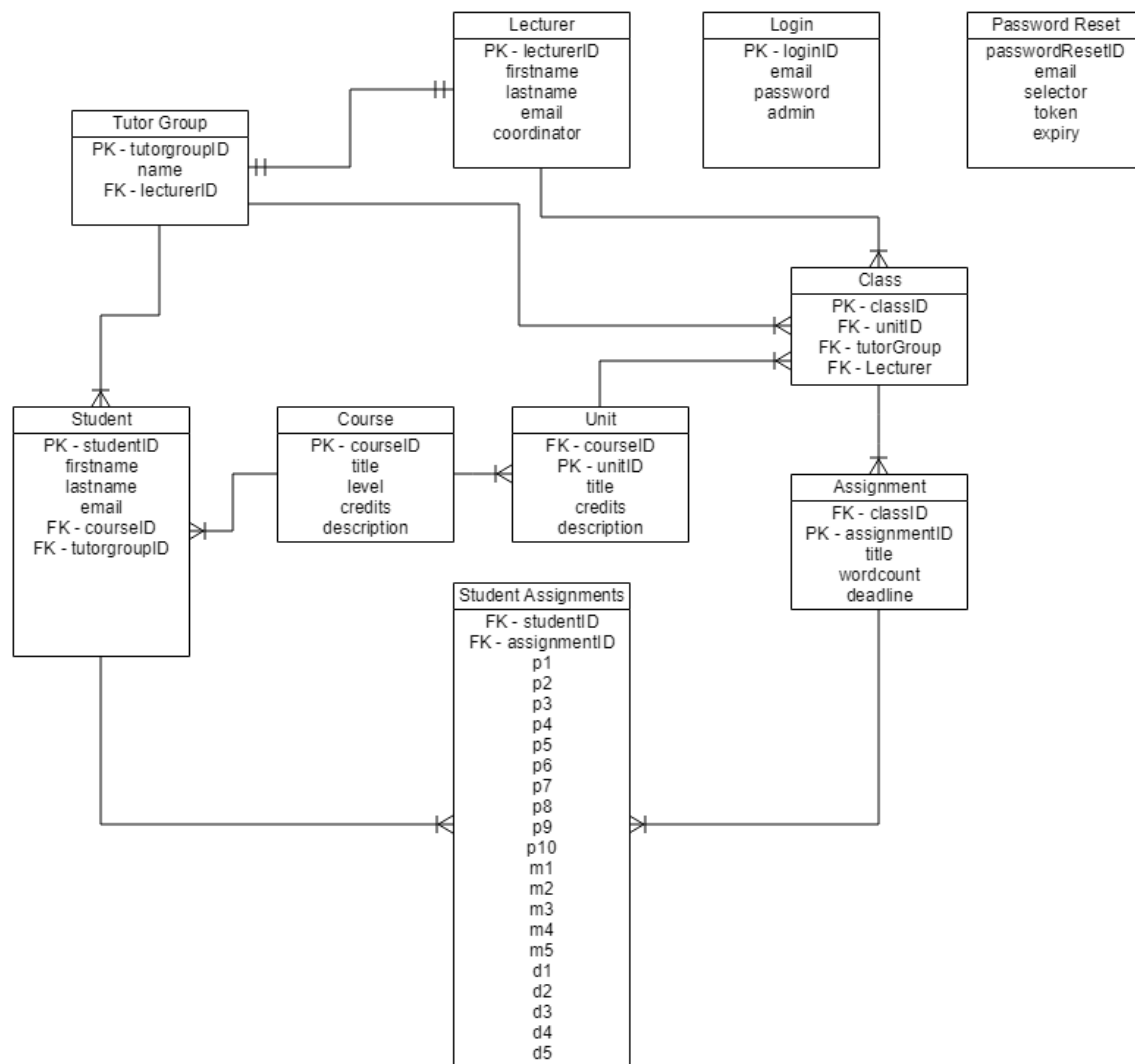
CLASS (classID, unitID, tutorGroupID, lecturerID)

ASSIGNMENT (classID, assignmentID, title, wordcount, deadline)

STUDENT_ASSIGNMENTS (studentID, assignmentID, p1 ... p10, m1 ... m5, d1 ... d5)

Final ERD

The final ERD after normalization contains 10 tables, 8 of which are connected using primary, foreign and compound keys. These keys form relationships between the tables and allow for easier database manipulation. Some examples of these relationships are that a tutor group can have many students but a student can only have once tutor group, this is a one-to-many relationship. A tutor group can only have 1 lecturer and a lecturer can only manage one tutor group therefore this relationship is one-to-one. A more advanced connection comes with the 'Student Assignments' table, linking 'Student' to 'Assignment' directly would form a many-to-many relationship as a student can have many assignments and an assignment can be given to many students. These tables are connected with a link table containing a compound key which is a form of candidate key unique identifier formed from the 'studentID' and 'assignmentID' foreign keys.



Data Dictionary

Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Student	Student Information	studentID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		firstname		varchar	40	-	FALSE	John
		lastname		varchar	40	-	FALSE	Doe
		email		varchar	100	-	FALSE	John.Doe@example.ac.uk
		courseID		int	11	FOREIGN	FALSE	1
		tutorGroupID		int	11	FOREIGN	FALSE	1
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Course	Course Information	courseID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		title		varchar	100	-	FALSE	Extended Diploma in IT
		level		int	11	-	FALSE	3
		credits		int	11	-	FALSE	120
		description		varchar	400	-	TRUE	This is a course that focuses on IT
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Unit	Unit Information	courseID		int	11	FOREIGN	FALSE	1
		unitID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		title		varchar	100	-	FALSE	Computer Systems
		credits		int	11	-	FALSE	20
		description		int	11	-	TRUE	This unit focuses on the basics
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Class	Classes formed from tutor groups, unit and lecturer	classID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		unitID		int	11	FOREIGN	FALSE	1
		tutorGroupID		int	11	FOREIGN	FALSE	1
		lecturerID		int	11	FOREIGN	FALSE	1
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Assignment	Assignments assigned to classes	classID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		unitID		int	11	FOREIGN	FALSE	1
		tutorGroupID		int	11	FOREIGN	FALSE	1
		lecturerID		int	11	FOREIGN	FALSE	1
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Student Assignments	Student criteria for assignments	studentID	compound key identifier	int	11	FOREIGN	FALSE	1
		assignmentID		int	11	FOREIGN	FALSE	1
		p1	target criteria is variable so need to cover all options	tinyint	1	-	TRUE	1
		p2		tinyint	1	-	TRUE	0
		p3		tinyint	1	-	TRUE	1
		m1		tinyint	1	-	TRUE	1
		m2		tinyint	1	-	TRUE	0
		d1		tinyint	1	-	TRUE	0
		d2		tinyint	1	-	TRUE	0
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Tutor Group	Combining students and lecturers into a group	tutorGroupID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		name		varchar	40	-	FALSE	TG001
		lecturerID		int	11	FOREIGN	FALSE	1
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Lecturer	Lecturer information	lecturerID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		firstname		varchar	40	-	FALSE	Jane
		lastname		varchar	40	-	FALSE	Doe
		email		varchar	100	-	FALSE	Jane.Doe@example.ac.uk
		coordinator		tinyint	1	-	FALSE	1
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Login	Login Information	loginID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		email		varchar	100	-	FALSE	Bob.Ross@example.ac.uk
		password		varchar	255	-	FALSE	ijnahch2098uh09j4ifjapoilhgt209r\$
		admin		tinyint	1	-	FALSE	0
Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Index	Nullable	Example
Password Reset	Password Reset Information and validation	passwordResetID	auto-incrementing identifier	int	11	PRIMARY	FALSE	1
		email		varchar	100	-	FALSE	Diana.Ross@example.ac.uk
		selector		varchar	255	-	FALSE	ijnahch2098uh09j4ifjapoilhgt209r\$
		passwordResetID		varchar	1	-	FALSE	982v98ahvvoi\$dhjajuf092uf9aufdja
		expiry		date	0	-	FALSE	24-12-2019

Verification

Location	Serial	Test	Expected Outcome	Actual Outcome	Pass/Fail
Register	1	Textboxes	Information can be typed into the textboxes with the passwords being masked		
Register	2	Validation	The textboxes are validated in real time with error messages		
Register	3	Register button	Show an error if no information is entered		
Register	4	Register button	Register successfully if all fields are filled		
Register	5	Log In button	Take you to the Log In page		
Log In	6	Textboxes	Information can be typed into the textboxes with the passwords being masked		
Log In	7	Validation	The textboxes are validated in real time with error messages		
Log In	8	Log In Button	Show an error if no information is entered		
Log In	9	Log In Button	Check the database for a user and take them to the dashboard		
Log In	10	Register button	Log in successfully if all fields are filled and redirect to dashboard		
Forgotten Password	11	Textbox	Information can be typed into the textboxes		
Forgotten Password	12	Validation	The textbox is validated in real time with error messages		
Forgotten Password	13	Send Button	Show an error if no information is entered		
Forgotten Password	14	Send Button	Check the database for a user and email the user a password reset token		

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Location	Serial	Test	Expected Outcome	Actual Outcome	Pass/Fail
Forgotten Password	15	Log In Button	Take you to the Log In page		
Password Recovery	16	Textboxes	Information can be typed into the textboxes with the passwords being masked		
Password Recovery	17	Validation	The textboxes are masked and validated in real time with error messages		
Password Recovery	18	Reset Button	Replaces the current password with the new password in the database		
All pages	19	Search Bar	Searches the database for students, courses, units and assignments		
All pages	20	Log Out	Logs the current user out, clears the session and redirects to the log in page		
All pages	21	Dashboard Button	Take you to the dashboard page		
All pages	22	Courses Button	Take you to the courses page		
All pages	23	Students Button	Take you to the students page		
All pages	24	Calendar Button	Take you to the calendar page		
All pages	25	Small Calendar	Shows upcoming assignments and redirects to the calendar page on click		
All pages	26	Quick Links	Take you to the linked places		
All pages	27	Logo	Take you to the dashboard page		
Dashboard	28	Upcoming assignments	Shows upcoming assignments and links to the students page filtered by students who have the assignment		

Location	Serial	Test	Expected Outcome	Actual Outcome	Pass/Fail
Dashboard	29	Course List	Shows a linked list of all the courses the logged in lecturer is attached to		
Dashboard	30	Timeline	Displays recent activity		
Dashboard	31	Tutor Group	Links students assigned to the lecturer who is logged in.		
Courses	32	Course Card	Clicking on a course card opens up a modal displaying detailed information		
Students	33	Datagrid	Shows a list of all students, their current grade and who their tutor is		
Students	34	Datagrid: Expanded	Clicking on a student expands their information with unit and assignment details		
Students	35	Datagrid: Assignment	The logged in lecturer can edit target criteria the student has met in their assignments and units		
Calendar	36	Detailed Information	Clicking on a day in the calendar opens up detailed information about that day or event		

Hardware and Software

Due to the system being a web application it should be able to run on any modern computer with a mouse and keyboard. The system should be able to integrate successfully into the already running web server at GCS however should due to the number of assignments issued an extra 1TB SSD is recommended for the database.

The websites functionality will be created primarily using HTML to display DOM elements with PHP and AJAX to communicate to the server. The websites design will be handled using CSS, Javascript and any appropriate Javascript plugins such as jQuery, datatables and sweetalert.

For testing the website will be hosted locally using WAMP, a web development environment that uses Apache2, phpMyAdmin and MySQL databases.

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Appendices

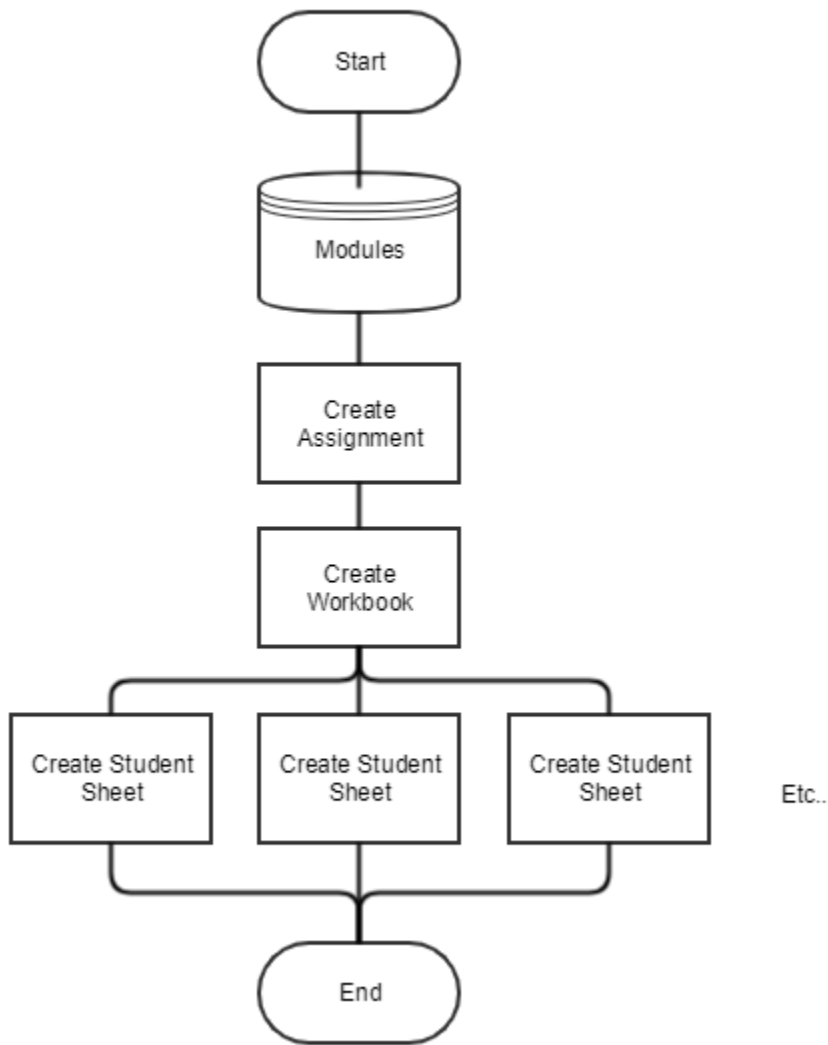
Appendix A

Abbreviations

HTML	Hypertext Markup Language
PHP	Hypertext Preprocessor
AJAX	Asynchronous Javascript and XML
JS	Javascript
CSS	Cascading Style Sheets
DOM	Document Object Model
SSD	Solid State Drive

Appendix B

B.1: Current
System Flow



B.2: Example Existing System Sheet

Blank Spreadsheet ☆

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

70% \$ % .0 .00 123 Calibri 11 B I S A

	A	B	C	D	E	F
1						
2		ASSESSMENT RECORD SHEET				
3		Programme	BTEC L3 90 Credit Diploma in IT BTEC L3 Extended Diploma in IT		Learner name	
4		Assignment title	Assignment 1		Assessor name	
5		Unit no. & title	Unit 3 - Information Systems		Targeted learning aims/assessment criteria	1 - Understand how organisations use business information 3 - Know the features and functions of information systems
6		First Submission				
7		Deadline	1/19/2018		Date submitted	1/19/2018
8		Targeted criteria	Criteria achieved? (yes / no)	Assessment comments		
9		P1	No	You have not achieved this grade as you have not explained how organisations use information		
10		P2	No	You have not achieved this grade as you have not described the features and functions of information systems		
11		P4	No	You have not achieved this grade as you have not discussed the characteristics of good information		
12		P5	No	You have not achieved this grade as you have not identified the information systems used in a specified organisation		
13		M1	No	You have not achieved this grade as you have not illustrated the information flow between functional areas		
14		D1	No	You have not achieved this grade as you have not explained how an organisation could improve the quality of its business information		
15		General comments				
16		A good first attempt at a difficult assignment				
17						
18		Assessor declaration	I certify that the evidence submitted for this assignment is the learner's own. The learner has clearly referenced any sources used in the work. I understand that false declaration is a form of malpractice.			
19		Assessor signature			Date	2/6/2018
20		Resubmission authorisation by Lead Internal Verifier*			Date of Feedback to learner	
21					Date	
22		* All resubmissions must be authorised by the Lead Internal Verifier . Only one resubmission is possible per assignment, providing:				
23		The learner has met initial deadlines set in the assignment, or has met an agreed deadline extension.				
24		The tutor considers that the learner will be able to provide improved evidence without further guidance.				
25		Evidence submitted for assessment has been authenticated and accompanied by a signed and dated declaration of authenticity by the learner.				
26		**Any resubmission evidence must be submitted within 10 working days of receipt of results of assessment.				
27						
28						
29		Resubmission				
30		Deadline			Date submitted	
31		Targeted criteria	Criteria achieved? (Yes / No)	Assessment comments		
32		P1	Yes	You have achieved this grade as you have explained how organisations use information		
33		P2	Yes	You have achieved this grade as you have described the features and functions of information systems		
34		P4	Yes	You have achieved this grade as you have discussed the characteristics of good information		
35		P5	Yes	You have achieved this grade as you have identified the information systems used in a specified organisation		
36		M1	No	Not Submitted		
37		D1	No	Not Submitted		
38		General comments				
39						
40						
41		Assessor declaration	I certify that the evidence submitted for this assignment is the learner's own. The learner has clearly referenced any sources used in the work. I understand that false declaration is a form of malpractice.			
42		Assessor signature			Date	
43					Date of feedback to learner	
44						

+ Student Name ▼

B.3: Existing
System
Questionnaire
Responses

20/03/2019

BTEC Student Tracker Questionnaire

BTEC Student Tracker Questionnaire

A questionnaire to find out the underlying problems with the current system and what can be changed to solve it.

Please enter your name *

Clive Prosser

What is the current system you are using to track student progress?

spreadsheet

What information do you need to track?

Criteria achieved and grade

What is frustrating about the current system that can be improved or changed?

Unable to track criteria met between assignments

Should students be able to access their progress?

Yes

20/03/2019

BTEC Student Tracker Questionnaire

Which are most important features to you?

- ☒ Having a centralized place to track students.
- ☐ Being able to see how students are performing in other lessons.
- ☒ Tracking what target criteria students have met.
- ☐ Being able to upload assignments for review (by the coordinator).
- ☒ Being able to see the current grade the student has achieved.
- ☐ Other: _____

Any other information or ideas you'd like to pass on?

20/03/2019

BTEC Student Tracker Questionnaire

BTEC Student Tracker Questionnaire

A questionnaire to find out the underlying problems with the current system and what can be changed to solve it.

Please enter your name *

Caroline Brangan

What is the current system you are using to track student progress?

Moodle and a spreadsheet

What information do you need to track?

Criteria achieved, student identity data (name, DOB), Assignment completion. Feedback.

What is frustrating about the current system that can be improved or changed?

repetition! we have to pass the data to different people, students, Course Leader/ co-ordinators.Tutors.

Should students be able to access their progress?

yes, and their parents if necessary.

20/03/2019

BTEC Student Tracker Questionnaire

Which are most important features to you?

- ☒ Having a centralized place to track students.
- ☒ Being able to see how students are performing in other lessons.
- ☒ Tracking what target criteria students have met.
- ☐ Being able to upload assignments for review (by the coordinator).
- ☒ Being able to see the current grade the student has achieved.
- ☐ Other:

Any other information or ideas you'd like to pass on?

.....

20/03/2019

BTEC Student Tracker Questionnaire

BTEC Student Tracker Questionnaire

A questionnaire to find out the underlying problems with the current system and what can be changed to solve it.

Please enter your name *

Paul

What is the current system you are using to track student progress?

Spreassheet

What information do you need to track?

Grades

What is frustrating about the current system that can be improved or changed?

No consistency between staff - each has their own system

Should students be able to access their progress?

possibly

20/03/2019

BTEC Student Tracker Questionnaire

Which are most important features to you?

- ☒ Having a centralized place to track students.
- ☒ Being able to see how students are performing in other lessons.
- ☒ Tracking what target criteria students have met.
- ☐ Being able to upload assignments for review (by the coordinator).
- ☒ Being able to see the current grade the student has achieved.
- ☐ Other: _____

Any other information or ideas you'd like to pass on?

Be adaptable

Appendix C

C.1: Interview with BTEC Coordinator transcript

Me: "Hello, thank you for taking the time to provide some insight into your current workflow when it comes to tracking students and their progress."

Coordinator: "Absolutely, I hear you're considering an application to replace the system we have in place currently?"

Me: "That is the plan. What exactly do you do with the current system?"

Coordinator: "Currently as a teacher, when my students hand in their assignments I grade them and use a generalised feedback spreadsheet template to store the results for the class. As a coordinator at the end of the year aggregating the data for each student is difficult."

Me: "What makes that process difficult?"

Coordinator: "Each teacher keeps their own spreadsheet containing their students progress, gaining access to those files takes extra unnecessary time and increases the margin of error."

Me: "Would creating a centralized secure location for this information to be accessed by teachers be beneficial to you?"

Coordinator: "That would be brilliant, it would save me so much time!"

C.2: Interview with BTEC Teacher transcript

Me: "Hello, thanks for taking this interview today. I'd love to hear how you're currently tracking your students progress?"

Teacher: "Ofcourse, basically after they've all handed in their assignments and it comes to marking I create a spreadsheet workbook with individual sheets containing the feedback for each student."

Me: "Could this process be improved on?"

Teacher: "Yes, the workbooks are difficult to navigate and sort. Only the sheet name is used to indicate which student is linked to which feedback, it's easy to get lost."

Me: "Would an application that allows you to see all of your students grade data in a centralized location be useful?"

Teacher: "That would be excellent, would it be possible to see their progress in other classes that I don't teach also? I'd like to see if underperformers in my classes are related to my performance as a teacher."

Me: "Using the system that I am designing all teachers will have access to all of the grade information for the students they teach. This way you can keep up to date with their progress as a whole and intervene if there are systemic problems!"

Appendix D

Pseudocode

D.1: Registering

```
//Validate Text Fields
  If //Text Fields are valid
    //Add the user to the database and send a confirmation email
  Else
    //Provide an Error Messages
```

D.2: Logging in

```
//Validate Text Fields
  If //Text Fields are valid
    //Check the database for the username/email
    If //Username/email exists
      //Verify passwords match
      If // Passwords match
        //Log in
      Else
        //Provide an Error Message
    Else
      //Provide an Error Message
  Else
    //Provide an Error Message
```

D.3: Forgotten Password

```
//Validate Text Field
  If //Text Field is valid
    //Check the email exists in the database
```

```
    If //Email exists
        //Send password reset email
    Else
        // Provide an Error Message
Else
    //Provide an Error Message
```

D.4: Password Recovery

```
//Validate Text Fields
    If //Text Fields are valid and passwords match
        //Encrypt the new password and store the encrypted password in
the database
    Else
        //Provide an Error Message
```

D.5: Dashboard

```
//Upcoming Assignments
//Using Assignment Table
    //Select assignments for classes the lecturer teaches that have a
deadline soon

//Course List
//Using Class Table
    //Select all of the units the lecturer teaches

//Tutor Group
//Using Tutor Group Table
    //Select the Tutor Group ID the lecturer teaches
//Using Student Table
    //Select all of the students with the correct Tutor Group ID
```

D.6: Courses

```
//Use the Course Table  
//Find all of the available courses  
//For each course, display a card containing the course  
information
```

D.7: Students

```
//Use the Students Table  
//Find all the students with the Lecturers Tutor Group ID  
//Display students on the page  
//Find all of the units the students are on.  
//Display the units in a dropdown for each student  
//Find all of the assignments the students have for each unit  
//Display the Assignments in a dropdown for each unit
```