



Primary Source

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Summary

CourseMap is a course planner designed primarily for undergraduate college students. It aims to be an application that will help students make sure that they fill the requirements for graduation, along with allowing them to test multiple different schedules for their future. Additionally, it also aims to help advisors by allowing them to more easily work with students on a plan that encompasses their whole time at college, along with giving advisors a tool to help verify that a student has met all of the requirements for graduation.

Value Proposition for Stakeholders

CourseMap directly provides value for the students who use its college course planner and advisors who track and manage their student's progress in meeting degree and graduation requirements.

For students, CourseMap is a tool for easily building college course plans that take all graduation requirements into account. Where a student once had to manually review their school's course catalog and track availability, requisites, and applicability to degree requirements, this application will perform all of the preparatory work so the student can focus on their planning activity.

For advisors, CourseMap is a tool to track and manage their students' course plans in relation to graduation requirements. After establishing the requirements for a particular program, CourseMap will evaluate all applicable students' plans for meeting those requirements. In any case, including those where flexibility is needed, advisors hold the final say in whether a student's plan is acceptable.

What this means for schools is that the course planning process is made easier, reducing the number of redundant problems that students and administrators have to figure out in the process. This allows any college department to focus more on other tasks and responsibilities while confident in the knowledge that their students have a well-informed idea of where they want to go in their program.

Beyond campus, CourseMap is beneficial to the families of students, who can rest reassured that their students are always on track to graduate in a particular time frame. The ability to plan on the basis of requirements allows for time constraints to be taken into account, which is of special importance to families where financial constraints limit the number of semesters a student can take in college.

Technologies

CourseMap will use several technologies to make the application more dynamic and user friendly. PHP will be used to create all of our pages such as index.php, auth.php, template.php, courses.php, new.php, plan.php, and options.php. In the PHP code, we will validate user permissions and query needed data from the database. Along with this, we will also include HTML in the PHP code to place content on the website that the user can see such as headers, paragraphs, images, etc. CSS and Bootstrap will be used to style our web pages and position elements to make the site aesthetically pleasing. Bootstrap will be especially helpful in making the site responsive with the inclusion of UI elements such as dropdown menus, modals, and buttons. MariaDB will be used to create and query our database for data regarding courses, major requirements, and concentration requirements. We will use Apache as our HTTP server to host the website. Lastly, JavaScript will be used to make the content more dynamic, allow users to interact with the web pages, and to check if the student's courses meet the graduation requirements.

Functional Requirements

Students must be able to log into CourseMap through their school's provided authentication system. In RPI's case, students would authenticate through the CAS system. They should be able to create and view their own personal college plans, along with viewing the plan that their advisor has set for them. However, it should be noted that students will be unable to edit the plan approved by the advisor. When creating plans, they should be able to either make a plan from scratch or by using a template provided. Students should then be able to add or remove courses from the plan by using the course prefix and number, and should also be able to add or remove semesters from a plan as needed, with a minimum of one semester in a plan. When adding a semester, it will be designated by year and season, which will affect the availability of courses to choose from for that semester.

Students should also be able to add and remove "requirement groups" from a plan, which are a list of courses and course groups, items that act as a single course that has multiple courses that a user can switch between that are checked to make sure that the student is taking all of the courses in the group. The primary purpose of requirement groups is to ensure that a student fills the prerequisites for graduation. They should be able to add these requirement groups from a preset list of requirement groups, and should be able to create and delete local requirement groups and local course groups for use in that plan alone. CourseMap should alert the student if their plan does not meet the conditions of all of the requirement groups, or if their plan contains courses in an order such that certain courses do not have their prerequisites met. If students have AP credits or transfer credits (or any other type of credit) that they are bringing in, they should be able to designate that they have taken those credits.

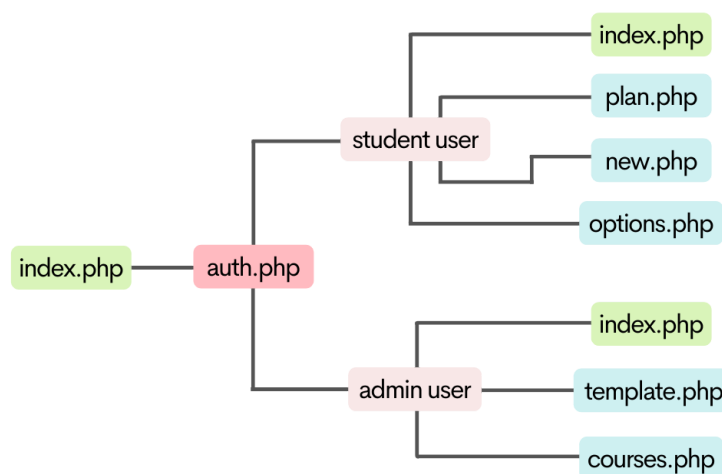
Advisors should be able to sign in with the system using the system that is used for staff authentication. They should be able to create and view a single plan for a student that is the "main" plan for the student. This plan should have identical behavior as student plans, with an additional note that AP/transfer/other credits should be designated by the advisor for the student here only for this plan. Additionally, they

should also be able to upload course information into the database and should be able to create, modify, and remove templates and requirement groups to be used by both advisors and students.

Non-Functional Requirements

Given that the web server is not under heavy load, all pages should be processed and sent to a client device within one second. Student plans should strictly be available to themselves, and faculty-created plans for a student should only be available to that student and faculty members. Courses, template and requirement groups should be inserted into the system as soon as possible - if done automatically, as soon as the content is available, and the manual process to do so should be intuitive for advisors. The authentication system should be designed in such a way that changing out the system in place of a different system should not be exceptionally difficult. Advisors should not be automatically verified by the authentication system, but rather should manually be verified and marked in the system as advisors, to avoid accidentally leaking user information. The front end should follow RPI's guidelines of accessibility.

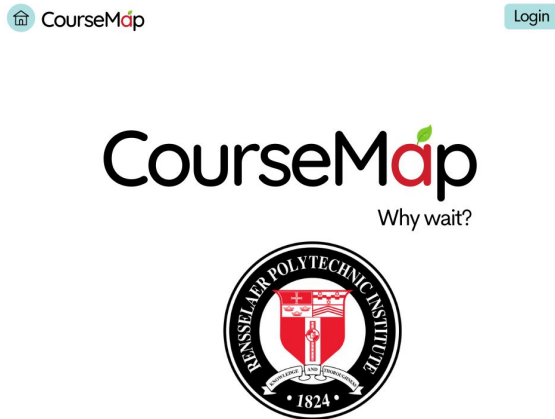
Site Map and Structure



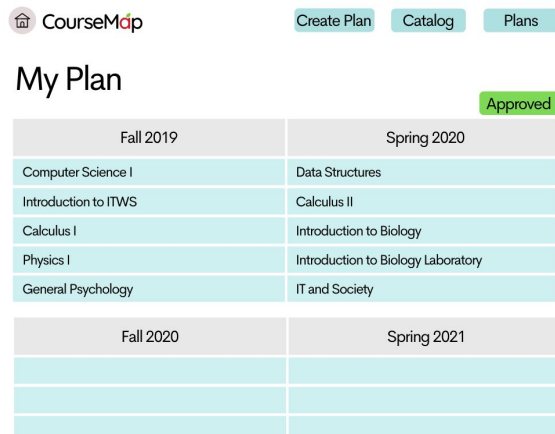
- index.html/php - Home page.
- auth.php - Handles user authentication.

- admin
 - template.php - Create requirement groups + templates.
 - index.php - Page which allows redirects to template.php, courses.php and also allows for advisors to lookup + go to student plan.
 - courses.php - Page to upload course information as .json.
- student
 - index.php - Allows students to view their current plans, along with making new plans.
 - new.php - Page for creating a new plan (template selection/course groups).
 - plan.php - View a single plan for the user.
 - options.php - Shows you all the available concentrations, pathways and HASS pathways.
- resources - Holds all the CSS, JavaScript, and images.
 - images
 - logo.png
 - js
 - css

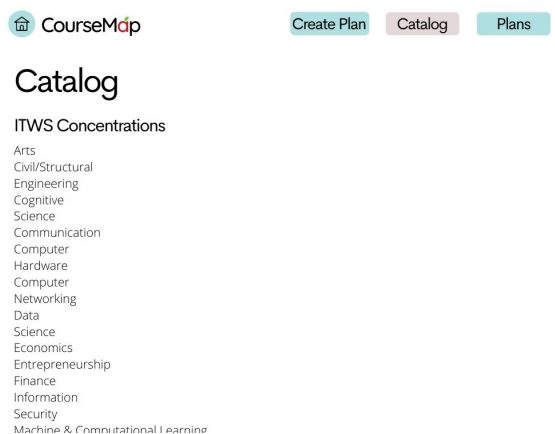
Wireframes



This is the login page. The page has the CourseMap logo as well as the RPI logo. When a user clicks the login button in the top right corner, they will be redirected to RPI CAS to ensure a secure login.



This is the homepage for the student viewer. This page displays the students current selected plan as well as whether or not it was approved by their advisor.



This page displays hyperlinks to templates for all of the concentrations for the ITWS Major.

CourseMap Create Plan Catalog Plans

Arts

Request Approval

Fall 2019	Spring 2020
Introduction to Information Technology and Web Science	Data Structures
Choice of ARTS Intro Class	IT and Society
Calculus I	Math Elective
Computer Science I	Physical Science Elective (PHYS-XXXX)
(Optional)	(Optional)

Fall 2020	Spring 2021
Foundations of Computer Science	Computer Organization
Web Systems Development	Introduction to Human Computer Interaction
HASS Elective	Web Science Systems Development

This page shows a template for a 4 year plan for the Arts concentration. Some classes are optional to input and some have to be inputted from the course catalog like the “Math Elective”

CourseMap Create Plan Catalog Plans

Courses

ITWS Courses

INTRO TO IT & WEB SCIENCE
WEB SYSTEMS DEVELOPMENT
IT & WEB SCIENCE CAPSTONE
DATABASE APPLICATIONS & SYST
BUSINESS ISSUES
MANAGING IT RESOURCES
DATA SCIENCE
DATA ANALYTICS
SOFTWARE DEVELOPMENT
TOPICS IN ITWS
DATABASE APPLICATIONS & SYST
BUSINESS ISSUES FOR ENGR & SCI
DATA SCIENCE
DATA ANALYTICS
SOFTWARE DEVELOPMENT
IT MASTER'S CAPSTONE
TOPICS IN ITWS
MASTER'S PROJECT

This page shows all of the course RPI offers. If a course needs to be added to a user's plan, they will be redirected to this page and can search for their desired course.

CourseMap Create Plan Catalog Plans

(Insert Name)

Request Approval

Fall 2019	Spring 2020

Fall 2020	Spring 2021

This page allows users to create custom plans rather than use a template. When a student is done creating their plan, they can request approval from their advisor.

Plans

Your Plans

Main Plan
Test Plan
Pre-Med Plan
MIS Plan
Special Interest Plan

This page displays all of the plans that the user has created. Whether it be their main plan or plans that they came up with out of curiosity they can view and decide which one they want to request for approval.

Plans

Updates

Sam Samuel's Plan: New Main Plan
Steve Stevenson's Plan: Pre-Med Plan
Bob Robertson's Plan: Plan
Sara Saraonson's Plan: MIS

Recent Plans

Sam Samuel's Plan
Steve Stevenson's Plan
Bob Robertson's Plan
Sara Saraonson's Plan

This is the homepage for academic advisors, on this page advisors can look at student plans that were recently updated as well as recent student plans that they viewed.

Approved Plans

Plans

Sam Samuel's Plan: Main Plan
Steve Stevenson's Plan: Main Plan
Bob Robertson's Plan: Main Plan
Sara Saraonson's Plan: Main MIS

This page shows advisors student plans that they have approved.

Student Plans

Plans

Sam Samuel's Plan
Steve Stevenson's Plan
Bob Robertson's Plan
Sara Saraonson's Plan

This page allows advisors to view all students' plans. They would click on the student's name and be able to view all of the plans that they have created.

New Requests

Plans

Sam Samuel's Plan
Steve Stevenson's Plan
Bob Robertson's Plan
Sara Saraonson's Plan

This page shows advisors student requests for approval.

Sam Samuel's Plan

[Approve](#)

Fall 2019	Spring 2020
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(Optional)	(Optional)
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HASS Elective	Web Science Systems Development

This page is what advisors see when they click on a students plan. Once they are on this page and view the plan they can decide whether or not to approve it.

Timeline

Task:	Description:	Name(s):	By Date:
index.php	Create homepage	Anya & Luke & Joyce	10/09/20
CAS (auth.php)	User authentication	Anya & Joyce	10/14/20
courses.php	upload course information (as .json)	Jacob & Jensen	10/23/20
Create databases	Courses, student specific courses	Jacob & Jensen	11/06/20
template.php	Create course groups + templates	Jacob & Jensen	11/06/20
options.php	shows you all the available concentrations, pathways and HASS pathways	Anya & Joyce	11/13/20
new.php	Create the page for making a new plan (template selection/course groups)	Luke & Joyce & Anya	11/20/20
plan.php	Create the page to view a single plan for the user	Luke & Joyce & Anya	11/20/20