Visual Course Planner

Project Charter

Version 0.5
10.23.2018

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1 INTRODUCTION

1.1 PROJECT INFORMATION

Project: Visual Course Planner for Computer Science (BSc and BA)
Project Sponsor: Dr. Abdallah Mohammed, Department of Computer Science, University of British Columbia, Okanagan
Project Manager: Noman Mohammed

1.2 PURPOSE OF PROJECT CHARTER

The Visual Course Planner project charter documents and tracks all necessary information required by the client and project team to approve the project. The project charters includes the needs, scope, justification and resource commitments to proceed or not proceed with the project. This document was created during the initialization of the phase of the project.

The intended audience of the Visual Course Planner project charter is the project client, project sponsor, and project team.

2 PROJECT AND PRODUCT OVERVIEW

The Visual Course Planner is a web application that allows students to visually organize their courses for the upcoming year(s) for a specific degree or program offered at the University of British Columbia Okanagan.

The creation of a Visual Course Planner will take place over the next 8 months, starting September 18th and finishing April 8th, 2019**.** Upon completion, students will be able to create an account and use the program to plan out their course schedule for their complete duration at UBC Okanagan. To create an account each user will be required to provide their first and last name, email, and a password. Users will be able to recover their forgotten password & email. First view of the planner will provide students with a default schedule based on the courses offered that year, tailored to whichever program they choose. The web interface will allow users to move and change courses via drag-and-drop functionality. Suitable warnings will be visible when a change to the default schedule is made. For example, when the change prolongs degree completion, or if prerequisites are needed. The program may also perform actions to fix a problem with the course plan (e.g. when a student moves a course, the program may move its prereqs so that they are allocated to an earlier semester). Students will be able to save up to 10 alternative plans on their account so they can leave and return to revise the the degree plan later. Adding Co-op, GoGlobal and summer courses to their degree plan will be an option, Their degree plan will update accordingly - whether that prolongs or shortens the degree completion, or adds or removes prerequisites. In addition, students will also be able to favourite (via a click of a button) and name their already saved plans for easy future reference. Adding a short memo to each saved plan will also be available. Students will be able to utilize a one-click optimization feature which will compress their degree length to the shortest period possible, based on a set of preferences and constraints (e.g., taking summer courses, enrolled in the co-op or Go Global program, or limited number of courses etc.).

Administrators of the visual course planner will be able to upload files to inform the system of currently offered courses, degree requirements, and courses that will be offered in the future. Administrators will not have access to student accounts to alter or view their degree plans. There is no limitation on how many administrator accounts can be created.

Course requirements and default degree plans will be extracted from the publicly available UBC Okanagan academic calendar web page.

No budget is applicable to this project.

3 JUSTIFICATION

3.1 BUSINESS NEED

Students at UBC, especially those new to the university, often have a difficult time seeing how courses fit into their overall degree requirements. At present, there is only a static web page that shows which courses are required for a given program without providing the course interdependencies. That information must be found elsewhere. Due to this, the information partition results in confusion around what courses to take during what semester to fulfill degree requirements.

4 SCOPE

The aim of this project is to create a desktop application that visualizes the course structure of a given academic program (e.g.. Computer Science majors in this case). Courses will be interlinked to show course interdependencies (e.g. prerequisites and corequisites). All courses will be distributed over several semesters (default 1 -4 years) that cover the program duration. Once a user (student) creates an account, the system will provide an initial course plan (as recommended by the department) depending on the chosen degree. Users will then be able to modify the plan to better suit their needs. Once done, the user can save their plan under their account so they can retrieve and revise it later if needed. The purpose of this project is to help students better plan out their course schedule for each year at UBC Okanagan. Live deployment and maintenance of the Visual Course Planner will not be included.

4.1 OBJECTIVES

The objectives of the Visual Course Planner are as follows:

1. Improve students' experience - especially new students - by streamlining their degree planning process and providing a clear course progression through their degree.
2. Assist academic advisors give proper degree advice based on students' chosen degree(s)

4.2 HIGH-LEVEL REQUIREMENTS

The following requirements that are presented are the projects product, service, or result must meet in order for the project objectives to be satisfied. A detailed breakdown may be seen in the next sections.

- The system will maintain a department recommended course plan which is scrubbed from the department's academic calendar web page. .
- Administrators can upload files into the system with information about degree requirements, program structure, and future courses offerings
- If administrators update program/course description, system will automatically check all saved plans and show warning to users as necessary.
- Users are warned of any prerequisite conflicts, prolonged degree completion, or missing credits
- System will store course information including course description, credits, and course code based on the academic calendar
- Users are able to create an account and store a maximum 10 degree plans
- Users are able to view, modify and optimize their saved degree plans

4.3 NON-FUNCTIONAL REQUIREMENTS

The following non-functional requirements specify how the Visual Course Planner will work upon completion.

1. Changes students makes to their plans will be automatically saved..
2. Users will need to enter their degree and course history before any courses are displayed.
3. Degree information is able to be uploaded by an administrator.
4. Shortest degree plan is suggested based off of which courses are offered the current year and which courses the student has tailored to their preferences.
5. Warnings are to be displayed immediately once a change has been made that affects the degree plan by prolonging the graduation date, and missing prerequisites..
6. The Visual Course Planner will be general purpose and can be used by students of any faculty
7. User data will be protected according to UBC privacy and protection standards[1]
8. The Visual Course Planner will be accessible through mobile devices

4.4 FUNCTIONAL REQUIREMENTS

The following functional requirements specify what the Visual Course Planner will do upon completion.

1. The system will periodically save the current plan a user is editing.
2. The system will display a warning summary including credits required
3. The system will use a drag and drop organization of courses that immediately updates the degree plan.
4. The system will store course information in a database.
5. System will be efficient with processing degree plan creation requests (minimal loading times)
6. System will be fault tolerant and recoverable.
7. Each account will be associated with up to 10 degree plans.
8. Each student is prompted to select a program upon creation of new degree plan.
9. A default degree plan is displayed in the Visual Course Planner based on the chosen degree .
10. The system will be able to optimize a students degree by compressing to the shortest time allowed.
11. A warning will be presented if a change to the degree plan prolongs the duration of degree, or prerequisites are needed.
12. Drag and drop functionality for the reorganization of courses based on the students preferences.
13. The optimization will run on the server and will be able to account for student preferences as parameters.
14. A menu that appears when user clicks on a course module in the visualization tool. This menu displays additional course information such as course description, credits & a link to the course page on SSC
15. Arrows of different colours and structure to identify a course's characteristics (prereq, coreq, etc)
16. System will support the creation of user accounts.
17. The system will be able to hide semesters of the users choosing
18. System will inform students to view their Visual Course Planner on major web browsers
19. On a mobile device the Visual Course Planner cannot be edited or changed in any manner.

4.5 USER REQUIREMENTS

The following user requirements specify how users will be able to interact with the Visual Course Planner.

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[1] https://cio.ubc.ca/sites/cio.ubc.ca/files/documents/standards/Std%2013%20Securing%20User%20Accounts.pdf

1. Users will be able to input their email, name, and a password of their choosing to create an account.
2. Users will be able to save up to 10 degree plans
3. Users will be able to drag and drop courses to make their degree plan
4. An "Optimize" button will allow the user to compress their degree plan into the shortest completion time depending on the set of constraints.
5. Administrators can upload current course and program information
6. Users can favourite course plans, making them clearly visible.
7. Users can add a text description to each of their saved course plans
8. Users are warned of any prerequisite conflicts, prolonged degree completion, or missing credits
9. Users can use the Visual Course Planner with major web browsers
10. Users will be informed if they are using an incompatible web browser
11. Users will be required to verify their account through a link sent to their email
12. Users are able to create an account
13. Users are able to view, modify and optimize their saved degree plans
14. Users can save a text description with every course plan.
15. Users can favourite their course plans

4.6 TECHNICAL REQUIREMENTS

The following requirements are any technical aspects the system must fulfill.

1. The system must be able to be displayed on a desktop web browser
2. The system must be able to be displayed on a mobile device

4.7 MAJOR DELIVERABLES

MAJOR DELIVERABLE	**DELIVERABLE DESCRIPTION**
Account Creation	Users are able to create, modify and save their potential degree plans
Course Recommendation Upload	The department will be able to upload a recommended degree plan file. Students are able to build their customized degree from the department recommendation.
Optimization	With one click, students will be able to compress their degree to the shortest amount time, given options like if they are taking summer courses, or are participating in the co-op program.
Course Display	Users can see all currently offered courses for the year the user is creating their degree plan.
Drag and Drop	Users can easily drag and drop courses to build their degree and see any course dependencies (prerequisites, corequisites, standing, minimum grade)
Interactive GUI	Have a visually pleasing and intuitive interface. Easily to understand regardless if the user is a first time user or one that has used to program before; understandable by students by all programs offered at UBC Okanagan campus.

4.8 OUT OF SCOPE

The following components will not be implemented in the Visual Course Planner.

1. The connection of each students UBC account and visual course planner will not be implemented.
2. Integration with another system (ie. UBC Okanagan website) can be supported using our API but will not implemented during the creation of the Visual Course Planner.
3. The ability to print or export each degree plan created by a student will not be provided.
4. Personalizing any visual components of the Visual Course Planner will not be optional; set colours, fonts, shapes, animations are final.
5. No more than 10 save degree plans can be saved. If a student reaches 10, they must delete already made plans to create another.
6. No email warnings will be sent.
7. The system will not need to handle massive amounts of users at once, maximum ~300 requests/hour.

4.9 ENVIRONMENTAL CONSTRAINTS

The following constraints specify mandatory requirements for the Visual Course Planner to function.

1. The system must run on a UBC Okanagan server

5 FEATURE BREAKDOWN

All features include unit testing time.

	Task	**Mackenzie**	**Taylor**	**Herraj**	**Jaskaran**	**Noman**
1	**Learning Technology Stack**	**20**	**30**	**30**	**30**	**30**
1.1	React Tutorials	10	20	20	20	20
1.2	Group Learning	10	10	10	10	10
2	**Design Document (total hours)**	**15**	**25**	**22**	**15**	**20**
2.1	Create data model	5	5	5	5	5
2.2	Create UML Diagram of data model			5		5
2.3	Website wireframes		10			
2.4	Diagrams	10	10	10	10	10
2.5	Weighted Decision Matrix for Stack			2		
3	**Backend (total hours)**	**70**	**0**	**45**	**40**	**50**
3.1	Setup server	10		5		

3.2	Create database				5	5
3.3	Implement Database operations	10		10	20	15
3.4	User Authentication	20		10	5	10
3.5	Setup CI on server	10		5		
3.6	Connect CI to GitHub	10		5		
3.7	Admin file upload					
3.8	Auto save plan	10		5	5	10
3.9	Prereq missing warning system			5	5	10
4	**User Interface (total hours)**	**55**	**100**	**80**	**80**	**110**
4.1	Admin file upload interface			10		5
4.2	Course list display sidebar			10	5	10
4.3	Course list filter			10	5	10
4.4	Login/signup screen		20	5		15
4.5	Degree history input		15			10
4.6	Course Drag and Drop	20	10	15	10	15
4.7	Semester/year view and layout		10	10	10	20
4.8	DAG Dependency Rearrange	30		5	5	10
4.9	DAG Dependency Display	5	20	5	5	10
4.10	Plan Favoriting system				10	
4.11	Plan Notes field				10	5
4.12	Styling		20		10	10
4.13	Warning summary		5	10	10	10
5	**Course Info Import (total hours)**	**20**	**10**	**0**	**0**	**0**
5.1	Academic calendar scraper for all courses		10			
5.2	Course importer from scraper	20				
6	**MVP Presentation (total hours)**	**12**	**12**	**12**	**12**	**12**

6.1	Create presentation	10	10	10	10	10
6.2	Practice presentation	2	2	2	2	2
7	**User Testing Session (total hours)**	**5**	**5**	**5**	**5**	**5**
8	**Degree Plan Optimization (total hours)**	**30**	**10**	**35**	**25**	**20**
8.1	Algorithm Design	10		5	5	5
8.1	Parameters Input			10		5
8.3	Implement Algorithm	20		10	10	20
8.4	Algorithm API				10	
8.5	Connect algorithm to course rearrange	10		10		
	Total Hours (all milestones)	**234**	**192**	**229**	**207**	**247**
	Avg Hrs/Week (24 weeks)	**9.8**	**8.0**	**9.5**	**8.6**	**10.3**

6 DURATION

6.1 PROJECT MILESTONES

The following are significant project milestones during the implementation of the VIsual Course Planner

Start Date	September 25, 2018
Project Charter and Scope	October 23, 2018
Design Document	November 13 ,2018
Backend	December 1, 2018
User Interface	January 1, 2019
Minimum Viable Product	January 8, 2019
User Testing	January 15, 2019
Optimization	February 1, 2019
Debugging + Final Touches	March 1, 2019
End Date	April 1, 2019

7 PROJECT BUDGET

Not Applicable.

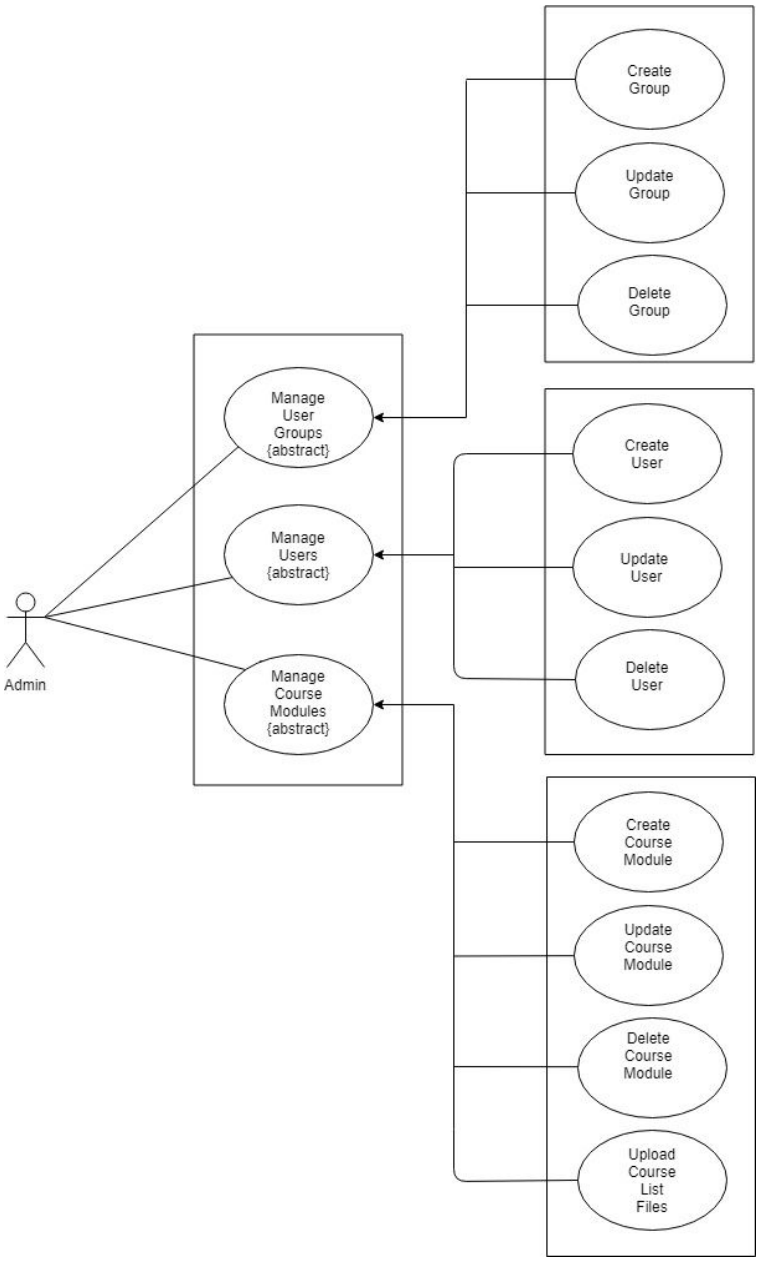
8 PROJECT METHODOLOGY

During the project, the team will use a ScrumBan approach, utilizing Trello as our task tracking board. ScrumBan is appropriate for this project and team because team members have other classes and projects to work on, so the flexibility of ScrumBan will allow us to work around these variable time limitations. Client meetings will occur once a week until the Design Document is completed, and bi-weekly after that.

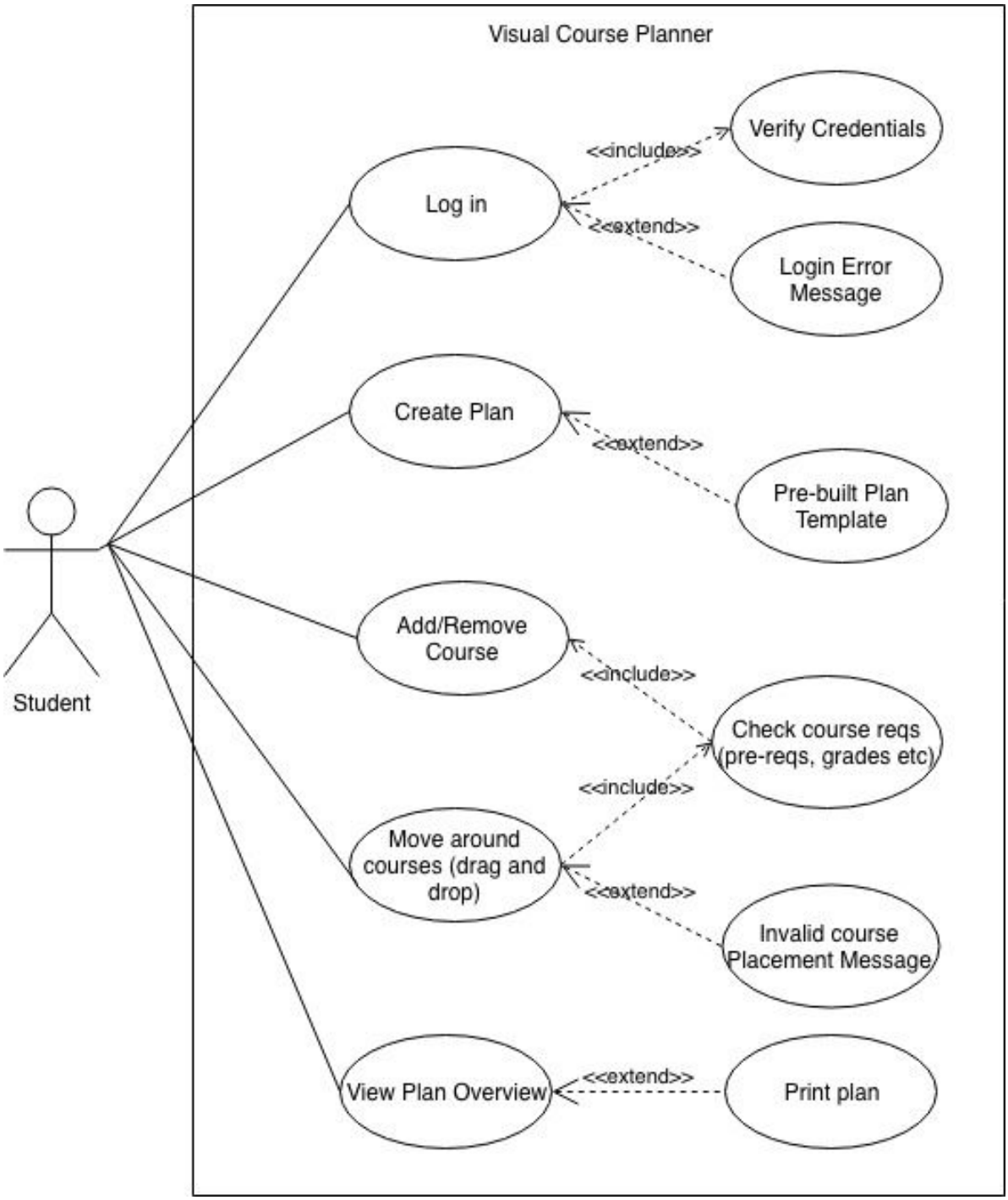
9 USER GROUPS

Identification of user groups and use case diagrams.

9.1 Admin Use Case



9.2 Student Use Case



10 ASSUMPTIONS, CONSTRAINTS AND RISKS

10.1 ASSUMPTIONS

The following conditions are not managed by the project team but required for the Visual Course Planner to function

1. Academic calendar is always up to date.
2. System does not have direct access to UBC course information.
3. Verification of a users identity is not required.
4. System will not store confidential student data.
5. Department will supply all necessary degree requirement information.
6. The TOS of the UBC Okanagan Academic Calendar allow course information to be scraped and used in the system.

10.2 CONSTRAINTS

This section identifies any limitation that must be taken into consideration prior to the initiation of the project.

	CONSTRAINT
1	Time constraint: 8 months from planning to completion
2	Approval of Scope and Charter. Once approved no additional changes will be supported to design or functionality of the Visual Course Planner.

10.3 RISKS

The following are risks that must be taken into consideration when implementing the VIsual Course Planner.

	RISK	**MITIGATIONS**
1	Project is not completed before the deadline.	Break project into manageable goals, in order to facilitate a clear outline of how much work needs to be done by what date. This will help keep the project on track to completion
2	Team members not contributing as much as needed - other commitments, courses, work etc.	Team members will track contribution time and if discrepancies are noticed, under-contributing team members will either have to contribute more time, or other team members contribute more time.
3	Personal emergencies such as but not limited to: family, and health.	Maintaining proper communication between team members will give us flexibility should emergencies arise.
4	Unable to scrape information from UBC Okanagan due to possibly IT problems preventing the Visual Course Planner being unable to display offered courses for the specific degree selected by user.	We will communicate with UBC IT to see if course information is able to be pulled from the academic calendar. If not, administrators will instead upload a file with the same course information.
5	UBC Okanagan server crash	Ensure through testing that our system is fault tolerant and that we are not causing the crash.

11 PROJECT ORGANIZATION

11.1 ROLES AND RESPONSIBILITIES

The following table lists the project's team members, their roles and their responsibilities.

NAME	ROLE	RESPONSIBILITIES
Noman Mohammed	Project Manager	Has the accountability for managing the project within the approved constraints of the scope, quality, time, and to deliver the specified requirements, deliverables and customer satisfaction. Also accountable to make sure all team members are on track and can successfully contribute to their other team members and project.
Herraj Luhano	Client Liaison	Maintains communication between the development team and the client.
Jaskaran Lidher	Developer	Works on programming tasks throughout the development of the VIsual Course Planner. Can take part in any category of programming.
Mackenzie Salloum	Integration Lead	Manages code repository master branch. Takes the accountability to make sure all code is properly push to the appropriate Git branch including team members branches and merging approved code to the Master branch.
Taylor Siemens	Technical Lead	Manages non-code documents in the repository
Dr. Abdallah Mohamed	Project Sponsor	Responsible for providing direction and support the team. In charge of approving the project scope represented in this document.

11.2 STAKEHOLDERS

Client	Dr. Abdallah Mohamed
Sponsor	Dr. Abdallah Mohamed
Project manager	Noman Mohammad
Project team members	Herraj Luhano, Jaskaran Lidher, Mackenzie Salloum, Noman Mohammad, Taylor Siemens
Other Internal Stakeholders	UBC Students, Dr. Scott Fazackerley, Academic Advisors

Other External Stakeholders	Non UBC students

12 APPROVAL SIGNATURES

The undersigned acknowledge they have reviewed the project charter and authorize the Visual Course Planner project. Changes to this project charter will be coordinated with and approved by the undersigned or their designated representatives.

Dr. Abdallah Mohamed, Project Client/Sponsor	Noman Mohammed, Project Manager