

EXECUTIVE SUMMARY

This project has been planned to develop software which is capable of calculating extracellular, resonance frequency and K plus clearance to analyse brain waves. The purpose of the project is to deliver the software that achieves client's expectations, which means that the software should be operated as a user-friendly application, be capable of processing the neurophysiological recordings which are provided by the client, and therefore, deliver the result of the recordings. In particular, the success of the software can be achieved with three specific requirements that the client expects the software to include. These are GUI design which focuses on the visual components and graphical icons on the screen, the frontend development that provides code sources to develop user interface (UI) and user experience (UX) of an application, and backend development which is used to contain the functionality of a database. In addition, the software is preferred to be operated as an application rather than a web-based application since the software contains data input, calculation and result delivery, which explains that application is more suitable to be applied. On the other hand, developing a web-based application requires a large and complex structure and a high-level connection such as the Internet, which is a disadvantage to the development. As a result, this project primarily focuses on the client's expectations so that the plan can be strategized, and thus, the software can be implemented accordingly with its advanced quality.

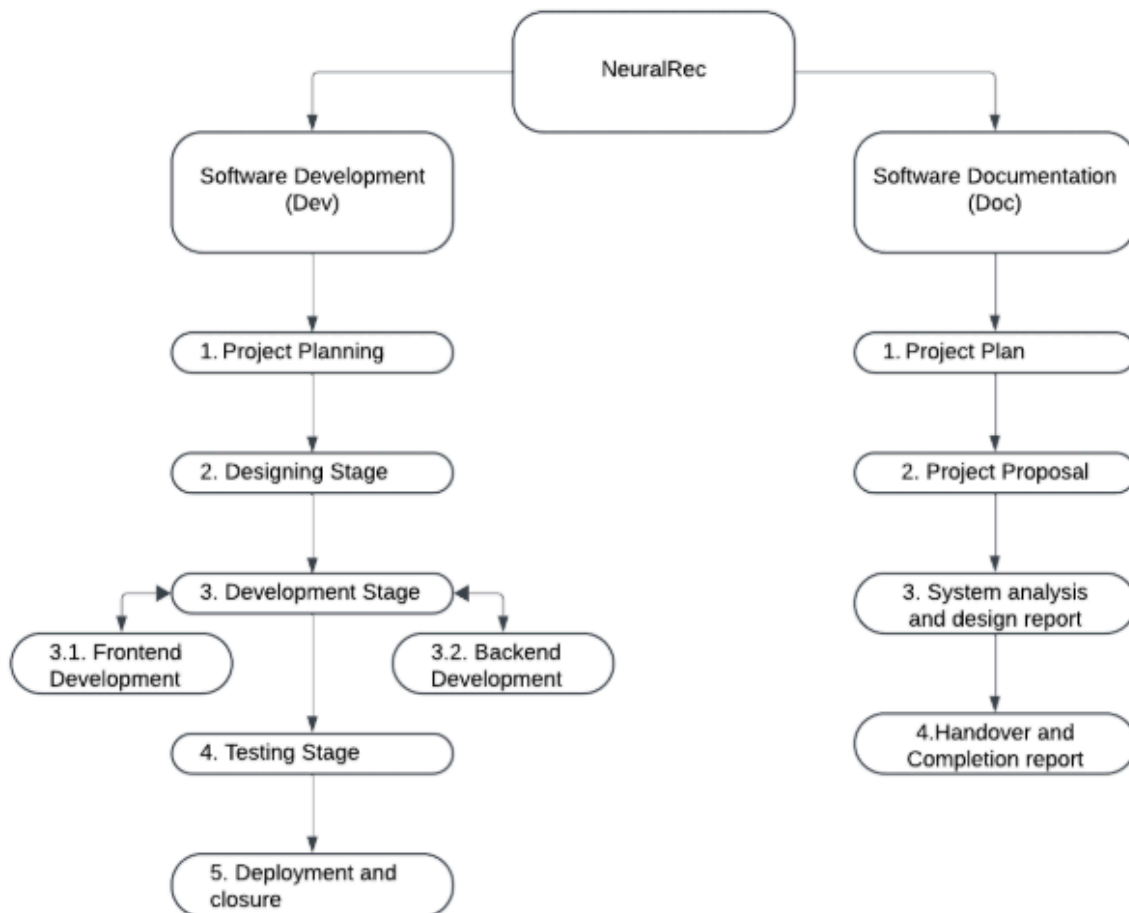
INTRODUCTION

Brain waves are served as the topic of the project, and the project plan is explained to introduce the software development that is engaged for the analysis and calculation of the brain waves. Moreover, the purpose of this project plan is to provide a comprehensive documentation which not only introduces the background, the functionality and the engagement of the project but also emphasises the importance of effective collaboration, various solutions against potential risks, and therefore, ensures that all tasks are completed before the expected dates. The project plan includes seven main sections which are work breakdown structure, project related risks, project related constraints, group milestone plan, individual task list, communication plan, and Gantt chart.

Work breakdown structure acts as the scope of the project to have a clear comprehension of the project by including several important factors. Both project related risks and constraints explain the negative impacts that potentially affect the project in the present and future in terms of various related aspects such as people, resources and so on. On the other hand, a group milestone plan concentrates on the progress of the project, which is a great instrument to observe the completion of each section before the planned date. Individual task lists provide a number of tasks that are allocated to each member, including the deadline dates and the percentage of completion so that team members can engage with high concentration and increase the work efficiency. It is also important to provide a schedule of communication since it contributes not only to the level of professional communication but also the efficient project. Therefore, Gantt Chart is utilised to perform the progress by a visual chart to have a clear overview and current level of completion.

WBS:

The WBS diagram, a breakdown of the work structure:



Software Development WBS list:

WBS	Task Description	Plan Start Date	Plan Finish Date	Task status	Task Phase	Task Type
1	Project Planning	22/03/25	28/03/25	Planned	Project Planning	Documenting
1.1	Define the scope	22/03/25	23/03/25	Planned	Project Planning	Documenting
1.2	Research technologies	26/03/25	27/03/25	Planned	Project Planning	Documenting
1.3	Set Goals and Objectives	26/03/25	27/03/25	Planned	Project Planning	Documenting
1.4	Gantt Chart and Project schedule	26/03/25	27/03/25	Planned	Project Planning	Documenting
2	Designing stage	29/03/25	07/04/25	Planned	Designing	Documenting
2.1	Design Front-end UI	30/03/25	02/04/25	Planned	Designing	Documenting
2.2	Establish UX design and ideology	01/04/25	03/04/25	Planned	Designing	Documenting
2.3	Design Backend Logic and dataflow	03/04/25	07/04/25	Planned	Designing	Documenting
3	Development Stage	31/03/25	23/05/25	Planned	Development	Coding
3.1	Frontend Development	01/04/25	23/05/25	Planned	Development	Coding
3.1.1	Initiate Frontend Development	01/04/25	03/04/25	Planned	Development	Coding
3.1.2	Create GUI Components	04/04/25	08/04/25	Planned	Development	Coding
3.1.3	Add minimal GUI Functionality for MVP	06/04/25	11/04/25	Planned	Development	Coding
3.1.4	Further Develop Minimal GUI for MVP	08/04/25	11/04/25	Planned	Development	Coding
3.1.5	Conduct internal testing	12/04/25	14/04/25	Planned	Development	Coding
3.1.6	Advance GUI components	05/05/25	09/05/25	Planned	Development	Coding
3.1.7	Finalise and Polish GUI Functionality	07/05/25	13/05/25	Planned	Development	Coding
3.1.8	Conduct internal testing	13/05/25	17/05/25	Planned	Development	Coding
3.1.9	Final GUI created	18/05/25	23/05/25	Planned	Development	Coding
3.2	Backend Development	01/04/25	23/05/25	Planned	Development	Coding
3.2.1	Initiate Backend Development	01/04/25	03/04/25	Planned	Development	Coding
3.2.2	Create ABF file loader	04/04/25	08/04/25	Planned	Development	Coding
3.2.3	Convert ABF file into CSV data	06/04/25	09/04/25	Planned	Development	Coding
3.2.4	Plot power spectrum heat map of trace	14/04/25	20/04/25	Planned	Development	Coding
3.2.5	Calculate the Spectrum power density over frequency	14/04/25	20/04/25	Planned	Development	Coding

3.2.6	Conduct internal testing	21/04/25	22/04/25	Planned	Development	Coding
3.2.7	Calculate the FFT of Current and Voltage Signals	21/04/25	27/04/25	Planned	Development	Coding
3.2.8	Plot Zap Profile	27/04/25	02/05/25	Planned	Development	Coding
3.2.9	Calculate the resonance Frequency	27/04/25	02/05/25	Planned	Development	Coding
3.2.10	Calculate the HWA (Half-Width at Amplitude)	29/04/25	02/05/25	Planned	Development	Coding
3.2.11	Conduct internal testing	30/04/25	02/05/25	Planned	Development	Coding
3.2.12	Filter for 50/60 Hz noise	02/05/25	06/05/25	Planned	Development	Coding
3.2.13	Segment K+ clearance into 4 episodes	07/05/25	12/05/25	Planned	Development	Coding
3.2.14	Calculate the Exponential Decay (Tau)	13/05/25	15/05/25	Planned	Development	Coding
3.2.15	Calculate the Rate constant (1/tau)	15/05/25	18/05/25	Planned	Development	Coding
4	Testing Stage	19/05/25	30/05/25	Planned	Testing	Testing
4.1	Perform unit testing	16/05/25	30/05/25	Planned	Testing	Testing
4.2	Conduct integration testing	16/05/25	30/05/25	Planned	Testing	Testing
4.3	Validate against business requirements	16/05/25	30/05/25	Planned	Testing	Testing
4.4	Acceptance testing	16/05/25	30/05/25	Planned	Testing	Testing
5	Deployment and Closure	28/05/25	30/05/25	Planned	Deploy	Deploying
5.1	Deploy and handover system	28/05/25	30/05/25	Planned	Deploy	Deploying
5.2	User Guide	23/05/25	28/05/25	Planned	Deploy	Deploying

Software Documentation WBS list:

WBS	Task Description	Plan Start Date	Plan Finish Date	Task status	Task Phase	Task Type
1	Project Plan	10/03/25	21/03/25	Planned	Project Plan	Documenting
1.1	WBS diagram	14/03/25	18/03/25	Planned	Project Plan	Documenting
1.2	Project related risks	14/03/25	18/03/25	Planned	Project Plan	Documenting
1.3	Project related constraints	14/03/25	18/03/25	Planned	Project Plan	Documenting
1.4	Group milestone plan	14/03/25	18/03/25	Planned	Project Plan	Documenting
1.5	Individual task list	17/03/25	18/03/25	Planned	Project Plan	Documenting
1.6	Communication plan	14/03/25	18/03/25	Planned	Project Plan	Documenting
1.7	Gantt chart	17/03/25	18/03/25	Planned	Project Plan	Documenting

2	Project Proposal	21/03/25	28/03/25	Planned	Project Proposal	Documenting
2.1	High-level Business functions	22/03/25	24/03/25	Planned	Project Proposal	Documenting
2.2	Functional requirements	23/03/25	25/03/25	Planned	Project Proposal	Documenting
2.3	Development release schedule	23/03/25	25/03/25	Planned	Project Proposal	Documenting
2.4	Cost benefit analysis	24/03/25	25/03/25	Planned	Project Proposal	Documenting
3	System analysis and design report	31/03/25	18/04/25	Planned	SAD report	Documenting
3.1	Risks and issues related to the system	01/04/25	04/04/25	Planned	SAD report	Documenting
3.2	Constraints related to the system	02/04/25	05/04/25	Planned	SAD report	Documenting
3.3	Software architecture diagram	03/04/25	06/04/25	Planned	SAD report	Documenting
3.4	Network and communication diagram	04/04/25	07/04/25	Planned	SAD report	Documenting
3.5	Use case diagram	05/04/25	08/04/25	Planned	SAD report	Documenting
3.6	Expanded use cases	06/04/25	09/04/25	Planned	SAD report	Documenting
3.7	Sequence diagram	07/04/25	10/04/25	Planned	SAD report	Documenting
3.8	entity relationship diagram	08/04/25	11/04/25	Planned	SAD report	Documenting
3.9	Database schema	09/04/25	12/04/25	Planned	SAD report	Documenting
3.10	Screen designs	10/04/25	13/04/25	Planned	SAD report	Documenting
3.11	List of messages	11/04/25	14/04/25	Planned	SAD report	Documenting
3.12	Feature/Function test plan	12/04/25	15/04/25	Planned	SAD report	Documenting
3.13	Candidate tests	13/04/25	15/04/25	Planned	SAD report	Documenting
4	Handover and completion report	24/05/25	30/05/25	Planned	HC report	Documenting
4.1	Candidate test results	24/05/25	30/05/25	Planned	HC report	Documenting
4.2	Variation report	28/05/25	30/05/25	Planned	HC report	Documenting

Project related risks:

1. Software Compatibility issues: (high impact level)

The application should hopefully work on both PC and Mac; however, some python libraries may not work the same way across OS.

Ways to mitigate this would be to test on both platforms from the beginning or use cross-platform GUI frameworks.

2. Scope: (high impact level)

Additional requirements or changes could extend the development time. To mitigate we need to clearly define the project scope in early meetings and use an agile approach with sprint-based deliverables.

3. Limited development time: (high impact level)

The project must be completed within the semester time frame, this makes time management very critical. We can break the project into milestones and track progress using the Gantt chart. Prioritize the core features and schedule weekly meetings for progress updates.

4. Team Availability: (medium impact level)

Team members may have other commitments which reduce availability. We should assign a buffer time in the project schedule.

5. Misalignment with client expectations: (high impact level)

The software may not meet the expectations for usability or analysis features. Conduct regular feedback meetings with the client. Share prototype versions for client testing.

6. Data Privacy & security: (medium impact level)

Neurophysiological data may contain sensitive research information that needs protection. We must implement secure data handling protocols, ensuring no unauthorized sharing of data.

Project related Constraints:

1. Limited development time, as the project must be completed within a time frame of one semester, we will prioritize core features first with stretch goals for extra functionality and track our progress with the Gantt cart. (time type)
2. Team skill level, team members have varying levels of experience with Python, GUI development, we'll assign tasks based on our individual strengths as well as utilize online resources for any learning gaps (resource type)
3. Ethical use of data, the tool should be used for academic/research purposes only, avoiding misuse of neuroscientific data, we can include a terms of use section in the software (legal/ethical type)

Milestones:

The following table lists the major milestones, their expected completion dates, and the assigned team members responsible for ensuring the completion of each task. These milestones help the team track progress, meet deadlines, and ensure timely delivery of key project components.

Milestone	Main Responsibility	Planned Date	Actual Date
Project Plan Submission	All team members	Week 3 (21/03/2025)	
Project Proposal Client Feedback	All team members	Week 4 (24/03/2025)	
Project Proposal Submission	All team members	Week 4 (28/03/2025)	
MVP Completion	All team members	Week 6 (07/04/2025)	
Working Prototype and Demonstration Client Feedback	All team members	Week 6 (07/04/2025)	
File Parsing Module Completed	All team members	Week 6 (09/04/2025)	
Working Prototype and Demonstration Submission	All team members	Week 6 (11/04/2025)	

System Analysis and Design Report Submission	All team members	Week 7 (18/04/2025)	
Signal Processing Module Completed	All team members	Week 12 (18/05/2025)	
Final GUI Implementation	All team members	Week 12 (23/05/2025)	
System Integration and Testing	All team members	Week 13 (30/05/2025)	
Handover and Completion Report Submission	All team members	Week 13 (30/05/2025)	
Diary and Reflection Report Submission	All team members	Week 13 (30/05/2025)	
Project Abstract and Video	All team members	Week 14 (06/06/2025)	
Final Presentation	All team members	Week 14 (06/06/2025)	
Project Plan Submission	All team members	Week 15 (13/06/2025)	

Individual List:

Team Member: Nathan Gatto				
Task	Deliverable	Start Date	End Date	% Complete (as of reporting)
(Doc) 1.4 Group Milestone Plan	Project Plan	14/03/25	18/03/25	100%
(Doc) 2.1 High-level Business Functions	Project Proposal	22/03/25	24/03/25	0%
(Doc) 3.6 Expanded use cases	System Analysis and Design Report	05/04/25	08/04/25	0%
(Doc) 3.11 List of messages	System Analysis and Design Report	11/04/25	14/04/25	0%
(Doc) 3.12 Feature/Function test plan	System Analysis and Design Report	12/04/25	15/04/25	0%
(Doc) 3.13 Candidate tests	System Analysis and Design Report	13/04/25	15/04/25	0%
(Doc) 4.1 Candidate test results	Handover and Completion Report	24/05/25	30/05/25	0%
(Dev) 1.4 Gantt Chart and Project Schedule	Project Planning	26/03/25	27/03/25	100%
(Dev) 3.1.5 Conduct internal testing	Development Stage – Frontend Development	12/04/25	14/04/25	0%
(Dev) 3.1.7 Finalize and Polish GUI Functionality	Development Stage – Frontend Development	07/05/25	13/05/25	0%
(Dev) 3.1.8 Conduct internal testing	Development Stage – Frontend Development	13/05/25	17/05/25	0%
(Dev) 3.1.9 Final GUI created	Development Stage – Frontend Development	18/05/25	23/05/25	0%
(Dev) 3.2.1 Initiate Backend Development	Development Stage – Backend Development	01/04/25	03/04/25	0%

(Dev) 3.2.14 Calculate the Exponential Decay (Tau)	Development Stage – Backend Development	13/05/25	15/05/25	0%
(Dev) 3.2.15 Calculate the Rate constant (1/tau)	Development Stage – Backend Development	15/05/25	18/05/25	0%
(Dev) 4.1 Perform unit testing	Testing Stage	24/05/25	30/05/25	0%
(Dev) 5.1 Deploy and handover system	Deployment and Closure	28/05/25	30/05/25	0%

Team Member: Khalil Ibrahim				
Task	Deliverable	Start Date	End Date	% Complete (as of reporting)
(Doc) 1.1 WBS diagram	Project Plan	14/03/25	18/03/25	100%
(Doc) 1.5 Individual List	Project plan	17/03/25	18/03/25	100%
(Doc) 2.3 Development Release Schedule	Project Proposal	23/03/25	25/03/25	0%
(Doc) 3.3 Software architecture diagram	System Analysis and Design Report	03/04/25	06/04/25	0%
(Doc) 3.8 entity relationship diagram	System Analysis and Design Report	08/04/25	11/04/25	0%
(Doc) 3.9 Database schema	System Analysis and Design Report	09/04/25	12/04/25	0%
(Doc) 4.2 Variation report	Handover and Completion Report	28/05/25	30/05/25	0%
(Dev) 1.2 Research Technologies	Project Planning	26/03/25	27/03/25	100%
(Dev) 2.3 Design Backend Logic and dataflow	Designing Stage	03/04/25	07/04/25	0%

(Dev) 3.1.1 Initiate Frontend Development	Development Stage – Frontend Development	01/04/25	03/04/25	0%
(Dev) 3.2.6 Conduct internal testing	Development Stage – Backend Development	21/04/25	22/04/25	0%
(Dev) 3.2.7 Calculate the FFT of Current and Voltage Signals	Development Stage – Backend Development	21/04/25	27/04/25	0%
Dev) 3.2.11 Conduct internal testing	Development Stage – Backend Development	30/04/25	02/05/25	0%
(Dev) 3.2.12 Filter for 50/60 Hz noise	Development Stage – Backend Development	02/05/25	06/05/25	0%
(Dev) 3.2.13 Segment K+ clearance into 4 episodes	Development Stage – Backend Development	07/05/25	12/05/25	0%
(Dev) 4.4 Acceptance testing	Testing Stage	16/05/25	30/05/25	0%

Team Member: Tri Vinh Phan				
Task	Deliverable	Start Date	End Date	% Complete (as of reporting)
(Doc) 1.6 Communication Plan	Project Plan	14/03/25	18/03/25	100%
(Doc) 1.7 Gantt Chart	Project Plan	17/03/25	18/03/25	100%
(Doc) 2.4 Cost Benefit Analysis	Project Proposal	24/03/25	25/03/25	0%
(Doc) 3.5 Use case diagram	System Analysis and Design Report	05/04/25	08/04/25	0%
(Doc) 3.7 Sequence diagram	System Analysis and Design Report	07/04/25	10/04/25	0%

(Doc) 3.10 Screen designs	System Analysis and Design Report	10/04/25	13/04/25	0%
(Dev) 1.1 Define the Scope	Project Planning	22/03/25	23/03/25	100%
(Dev) 2.2 Establish UX Design and Ideology	Designing Stage	01/04/25	03/04/25	0%
(Dev) 3.1.2 Create GUI Components	Development Stage – Frontend Development	04/04/25	08/04/25	0%
(Dev) 3.1.6 Advance GUI components	Development Stage – Frontend Development	05/05/25	09/05/25	0%
(Dev) 3.2.2 Create ABF file loader	Development Stage – Backend Development	04/04/25	08/04/25	0%
(Dev) 3.2.3 Convert ABF file into CSV data	Development Stage – Backend Development	06/04/25	09/04/25	0%
(Dev) 3.2.4 Plot power spectrum heat map of trace	Development Stage – Backend Development	14/04/25	20/04/25	0%
(Dev) 4.2 Conduct integration testing	Testing Stage	24/05/25	30/05/25	0%
(Dev) 5.2 User Guide	Deployment and Closure	23/05/25	28/05/25	0%

Team Member: Juliet Jin				
Task	Deliverable	Start Date	End Date	% Complete (as of reporting)
(Doc) 1.2 project related Risks	Project Plan	14/03/25	18/03/25	100%
(Doc) 1.3 Project Related Constraints	Project Plan	14/03/25	18/03/25	100%
(Doc) 2.2 Functional Requirements	Project Proposal	23/03/25	25/03/25	0%

(Doc) 3.1 Risks and issues related to the system	System Analysis and Design Report	01/04/25	04/04/25	0%
(Doc) 3.2 Constraints related to the system	System Analysis and Design Report	02/04/25	05/04/25	0%
(Doc) 3.4 Network and communication diagram	System Analysis and Design Report	04/04/25	07/04/25	0%
(Dev) 1.3 Set Goals and Objectives	Project Planning	26/03/25	27/03/25	100%
(Dev) 2.1 Design Front-end UI	Designing Stage	30/03/25	02/04/25	0%
(Dev) 3.1.3 Add minimal GUI Functionality for MVP	Development Stage – Frontend Development	06/04/25	11/04/25	0%
(Dev) 3.1.4 Further Develop minimal GUI for MVP	Development Stage – Frontend Development	08/04/25	11/04/25	0%
(Dev) 3.2.5 Calculate the Spectrum power density over frequency	Development Stage – Backend Development	14/04/25	20/04/25	0%
(Dev) 3.2.8 Plot Zap Profile	Development Stage – Backend Development	27/04/25	02/05/25	0%
(Dev) 3.2.9 Calculate the resonance Frequency	Development Stage – Backend Development	27/04/25	02/05/25	0%
(Dev) 3.2.10 Calculate the HWA (Half-Width at Amplitude)	Development Stage – Backend Development	29/04/25	02/05/25	0%
(Dev) 4.3 Validate against business requirements	Testing Stage	24/05/25	30/05/25	0%

Communication plan:

Communication is one of the essential factors that contributes primarily in the project, which creates opportunities for team members, supervisor and client to provide various ideas, and thus, choose suitable methods and ideas for the project by communicating with each other. In this communication plan, several tools will be used to support efficient communication. Zoom will be the primary platform for virtual meetings, and WhatsApp or Discord will be used for discussion, file updates, and file uploads. Various meeting types are scheduled throughout the project.

Firstly, there are two types of team meetings which are online and face-to-face. The online team meetings will be held every Friday at 4pm and the face-to-face team meetings will be held every Wednesday at 3pm. These two types of meetings help team members not only to discuss the project and allocate tasks for each member, but also to have a more understandable insight into addressing problems and challenges.

Secondly, communication with the academic supervisor is mandatory for team members because the supervisor provides simple explanations of the project when the team fails to understand the problems of the project. Furthermore, it is important to acquire beneficial lessons from the supervisor such as communication or behaviours which are needed to be more professional. In the schedule, supervisor meetings will be held online every Friday at 3pm to report the progress of the project and receive feedback.

Lastly, the client meeting is the most important meeting of all types of meeting since it plays a core role in explaining the main objectives of the project, sharing the client's expectation and fundamental documentation. Moreover, the client is also the person that will provide feedback on the project during the testing to check whether it meets all the client's requirements. In terms of the schedule, the first meeting of the client will occur as a face-to-face meeting at Campbelltown Campus since the client desires to meet the team members in person to explain what they are expecting clearly and show the equipment of the project. Once the first meeting is done, online meetings will be held.

Meeting Type	Length	First Meeting	How Often	Number of Meetings Planned	Location/Mode
Face-to-Face Client Meetings	60 mins	13/03/2025	Thursday 12pm	1	Campbelltown Campus
Online Client Meetings	60 mins	20/03/2025	Once in every two weeks	6	Online/Zoom
Academic Supervisor	60 mins	14/03/2025	Weekly, Friday 3pm	13	Online/Zoom
Online Team Meetings	60 mins	14/03/2025	Weekly, Friday 4pm	7	Online/Zoom
Face-to-Face Team Meetings	30-60 mins	19/03/2025	Weekly, Wednesday 3pm	7	Parramatta South or city Campus

ID	Task Name	2025-03		2025-04				2025-05					2025...
		16	23	30	06	13	20	27	04	11	18	25	01
1	▼ (Dev) Project Planning												
2	Define the scope												
3	Research technologies												
4	Set Goal and Objectives												
5	Gantt Chart and Project Schedule												
6	▼ Designing Stage												
7	Design Frontend UI												
8	Establish UX design and ideology												
9	Design Backend Logic and dataflow												
10	▼ Development Stage												
21	▼ Backend Development												
25	Plot Power Spectrum Heat Map of trace												
31	Filter for 50/60Hz Noise												
28	Plot Zap Profile												
32	Segment K+ Clearance into 4 episodes												
22	Initiate Backend Development												
23	Create ABF file loader												
30	Calculate the HWA (Half-width at amplitude)												
34	Calculate the rate constant (1/Tau)												
27	Calculate the FFT of current and voltage si...												
26	Calculate the Spectrum power density ove...												
24	Convert ABF file in CSV data												
29	Calculate the Resonance Frequency												
33	Calculate the exponetial decay (Tau)												
11	▼ Frontend Development												
13	Create GUI Components												
12	Initiate Frontend development												
19	Conduct Internal testing												
16	Conduct internal testing												
14	Minimal GUI Functionality for MVP												
20	Final GUI created												
18	Finalise and polish GUI function												
15	Further develop minimal GUI for MVP												
17	Advanced GUI components												
39	▼ Deployment and Closure												
40	Delay and handover system												
41	User Guide												
35	▼ Testing Stage												
36	Perform Unit Testing												
37	Conduct Integration testing												
38	Validate against business requirements												

Conclusion:

This project plan is a comprehensive plan for the success of the project by providing main objectives, the tasks list for each member to work on and suggesting various solutions to prevent risks and constraints accordingly, which increases the efficient functionality of the project. It provides structured documentation of several important features such as task management, risks and constraints and others so that members can follow in a simple way. Moreover, the project plan also highlights the team collaboration and professional work since it demands not only team members, but also client and supervisor to have professional performance and communication, and also high level of concentration on the project by maintaining organization, allocating suitable schedules of meetings, and proposing concepts for the project according to requirements. In conclusion, the project plan is a supportive instrument that helps team members to have an appropriate comprehension of the project, including highlighting important requirements and completing tasks effectively so that the project can be delivered on time and achieve the expectations of the project.