Executive Summary

The purpose of the Environmental Sensor for Thai Agriculture Application project is to provide a tool which generates accessible environmental information in a farming environment in Thailand. The physical device collects sensor data from multiple locations across a farming area and sends the data to an online server. Online software then automatically presents the data in a way that is easy for the general population of Thailand to read and use. The goal of creating such a system is to provide transparency and insight into the environmental effects of organic farming practices for consumers and the general public.

We had 4 main development stages: defining the goals of the project, technical planning, building individual blocks of the project, and integration and testing. The main goals of the project, what the device should aim to do at the end, were set and remained unchanged once the second phase was over. This is because what the project would aim to achieve needed to be within the boundaries of what we believed it could achieve based on the second phase of technical planning. Technical revisions to the original plans were made after this point, however they were made without disrupting the project's objectives. These first two phases were intensely collaborative, involving a lot of discussion and research.
While building the individual blocks of the design, the work tended to be more individual as we dove deep into our areas of technical expertise. This was possible because in phase two: technical planning, we had defined the interfaces between these blocks very clearly to ensure that we would be able to successfully integrate the blocks once they were all working. This also meant that each individual was free to problem solve and change aspects of design within the blocks they were responsible for so long as the agreed upon interfaces would be the same. Problem solving in teams of two, three, or all of us still happened during this phase as roadblocks were hit and resolved. The integration of these individually built and tested blocks was once again an intensely collaborative effort, as each individual understood well the way that their blocks worked and what interfaces they had produced to match up with each other, all 4 of us were needed to combine the parts into a whole.

We learned how to work on a team of varying expertise, especially during phases 3 and 4 of our project each individual knew their section well but had less understanding of the technical details of the other sections. Learning to communicate technical information to each other in order to integrate the project and problem solve together was a significant lesson.

We also learned firsthand the necessity of iteration in design, many of the design decisions we thought would work in the first technical planning went through multiple changes before the final working project was made. This also drove home the need to "fail fast" as a change to one part of the project can have a ripple effect. For example, when we changed the microcontroller (twice), the layout of the PCB also had to change. While this was not a difficult task, it took up some time and had some added lead time.

The final lesson we learned as a team was to seek out mentorship and review to help with difficult problems. Learning from each other, our instructors, and other project teams to overcome hurdles such as figuring out how to securely mount our components in the enclosure (something none of us had ever had to do before) was integral to our success in this project. This took many forms, including casual conversations, emails, and one on one meetings.

	FALL TERM																WINTER TERM												SPRING TERM										
	SEPTEMBER				OCTOBER				NOVEMBER					DECEMBER				JANUARY					FEBRUARY				MARCH				APRIL				MAY					JUNE
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PROJECT WEEK	-	-	0	1	2	3	4	5	6	7	8	9	10	F	B	B	B	11	12	13	14	15	16	17	18	19	20	F	B	21	22	23	24	25	26	27	28	29	30	F
PHASE ONE																																								
Project concepton and definition							Project Charter																																	
						Define Engineering Requirements																																			
							Project Partner Update 1		Project Partner Update 2		Project Partner Update 3																															
						Create Block Diagram				Block Diagram																															
						Team Protocols and Standards Document		Team Communicat ion Evaluation		Team Reflection																															
PHASE TWO																												Block integr ation												
Project Execution																		Project Database Update		Block One Validation and Checkoff				Block Four Validation and Checkoff		Block Seven Validation and Checkoff														
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PHASE THREE																																								
Project performance and Control																														Initial System Testing			Final System Testing							
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F: Finals B: Breaks																																								