This form must be filled out by the student, signed and handed in to the module administrator early in the semester. Both the student and the supervisor must sign the agreement on main details and mutual responsibilities. The student should discuss their GA achievement plan with the supervisor, before completing this form. Only the student signs their GA achievement plan, as it is their own responsibility. ***This plan is NOT a guaranteed recipe for passing Project (E) 448.*** *Rather, it serves as a record of the student having considered these important aspects at an appropriately early stage. GA achievement plans should be revised as needed and in consultation with the supervisor, during the course of the project.*

Main details

Student	Initials and surname	G Liebenberg	SU number	22546723
Supervisor	Initials and surname			
Project title	Automated plant care system			
Project description, including the aim, scope and envisioned approach (max. 150 words)	The aim of this project is to create a device that is able to automatically monitor and maintain optimal soil moisture levels of plants and track their exposure to sunlight. This will be achieved by using a soil moisture sensor, UV light sensor and a microcontroller to monitor the plant and log data. A pump will be used to automatically provide water when the soil moisture level is too low. A mobile application will allow users to view recorded data and set a soil moisture level target. The project will focuss specifically on indoor herb gardens as monitoring and maintaining larger outdoor gardens requires larger, more complex systems that would require significantly more time and resources to develop.			

Mutual responsibilities

1. It is the responsibility of the student to clarify aspects such as the definition and scope of the project, the place of study, research methodology, reporting opportunities and -methods (e.g. progress reports, internal presentations and conferences) with the supervisor.
2. It is the responsibility of the supervisor to give regular guidance and feedback with regard to the literature, methodology and progress.
3. The rules regarding submission and evaluation of the project is outlined in the module framework and SUNLearn page and will be strictly adhered to.
4. The supervisor conveyed the departmental view on plagiarism to the student, and the student acknowledges the seriousness of such an offence.
5. The supervisor certifies that the project as described above has sufficient scope to achieve, in principle, the required GAs.
6. It is the responsibility of the student to initiate a discussion with the supervisor on GA achievement prior to filling out and handing in this form.

Signatures for agreement on main details and mutual responsibilities

Role	Signature	Date
Student		16 Feb 2024
Supervisor		

Student's graduate attribute (GA) achievement plan

How will GA 1 **(problem solving)** be achieved? *(<=100 words)*

The project can be divided into multiple sub-systems, each of which present a unique problem with mostly undefined requirements. Each of these sub-problems will require further research and an original design to solve.

How will GA 2 **(application of scientific and engineering knowledge)** be achieved? *(<=100 words)*

Designing, building and testing the circuits as well as developing the microcontroller code required to complete this project will require the application of knowledge gained through multiple engineering modules.

How will GA 3 **(engineering design)** be achieved? *(<=100 words)*

The project will require the designing and building of unique circuits and code to solve the multiple sub-problems of each part of the system.

The project will also require the design and development of an original mobile application.

How will GA 4 **(investigations, experiments and data analysis)** be achieved? *(<=100 words)*

Each sub-system will require further research to identify requirements. Testing procedures will be developed and executed to determine whether the system and individual sub-systems meet the requirements specified.

How will GA 5 **(engineering methods, skills and tools, including IT)** be achieved? *(<=100 words)*

An electronic circuit simulator such as LTspice will be used to design and verify circuit designs.

Code for the microcontroller will be developed using the Arduino IDE.

Physical circuits and sub-systems will be tested using a range of discipline-specific tools such as those available in the electronics labs.

An IDE such as Android Studio will be used to develop a mobile application to provide a user interface.

How will GA 6 **(professional and technical communication)** be achieved? *(<=100 words)*
The project includes a written report and an oral presentation. These demonstrate competence to communicate effectively, both orally and in writing.
How will GA 8 **(individual work)** be achieved? *(<=100 words)*
The student will take primary responsibility for successful completion of all aspects of the project.
How will GA 9 **(independent learning ability)** be achieved? *(<=100 words)*
For successful completion of the project, the student is required to acquire knowledge independently (from the literature or the internet, for example) and without the context of this required knowledge being fully specified in the project definition.

Signature acknowledging own responsibility to achieve GAs

	Signature	Date
Student		16 Feb 2024