
EE 4910 WEEKLY REPORT: 1

2/3/2026 – 2/17/2026

Group number: 06

Project title: Developing a Cost Effective Near VIS Spectrometer

Client &/Advisor: Avishek Das & Manojit Pramanik

Team Members/Role: Ryan Majstorovic, Evan Tamer, Dawson Posekany, Samar Gill

Weekly Summary

This week the team is laying out a plan to build a module-based spectrometer measuring from 400nm to 1000nm. Our first goals are split between two-man teams. Ryan and Dawson will work on integrating the CCD onto a driver board while Samar and Evan will work on programming for the STM32 MCU using STM32CubeIDE and initiate discussions about the required optics with Professor Jay Kim. Additionally, we will evaluate the pros and cons of LabVIEW, MATLAB, and Python for the display software.

Past week accomplishments

On February 5th and 16th, the team met with the project's contact, Avishek, so that the group could form a roadmap for the semester and define key deliverables and target deadlines. The project was broken down into three subsystems. Those being Optics, Analog CCD Detection, and the Digital Microcontroller. The system's end goal functionality is to be a VIS-NIR spectrometer operating in the 400–1000 nm range, using a white light source, slit, lens, mirror, and diffraction grating to disperse light onto a silicon CCD detector (1 x 3680 pixels). The analog CCD output is then digitized and sent to a PC via USB through the STM32F411 microcontroller. (See Images 1 & 2 for the system diagram and subsystem breakdown.)

The focus for the next few weeks is on the analog CCD and driver for PCB and the digital microcontroller interface, with the optics being revisited later. The immediate goal is to have a PCB design ready for review by next week, with the intent of placing an order shortly after. Tasks were also assigned, with Ryan and Dawson leading the analog PCB design, Evan working on the STM32F411 microcontroller programming, and Samar handling the optical subsystem research and organizing the electronics parts list. The team also received materials related to the optical components and CCD operation.

The previous 2 weeks have been focused on understanding the scope of the project and gathering information about the specific MCU and CCD that we will be using for our first design.

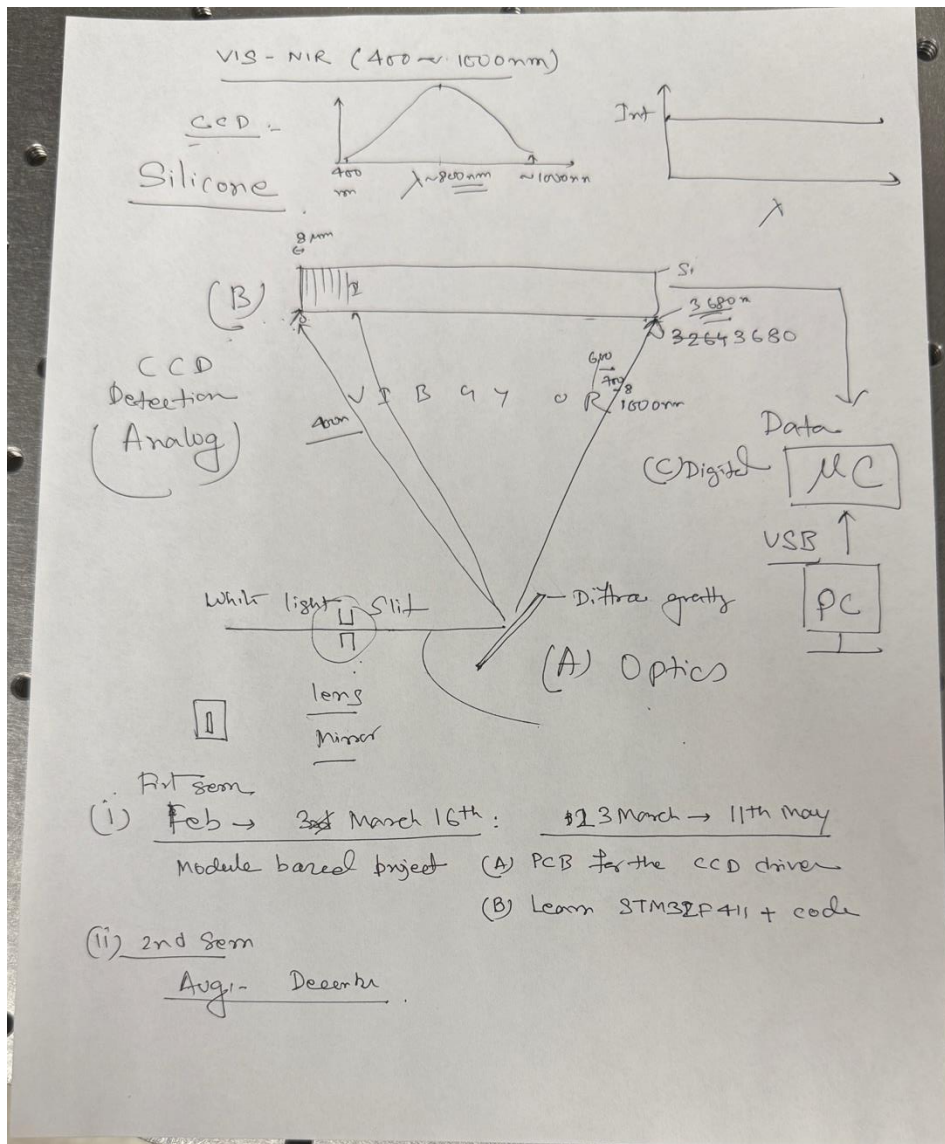


Image 1: Drawings used in Aid of Clarifying Project Scope, and Modularizing Development

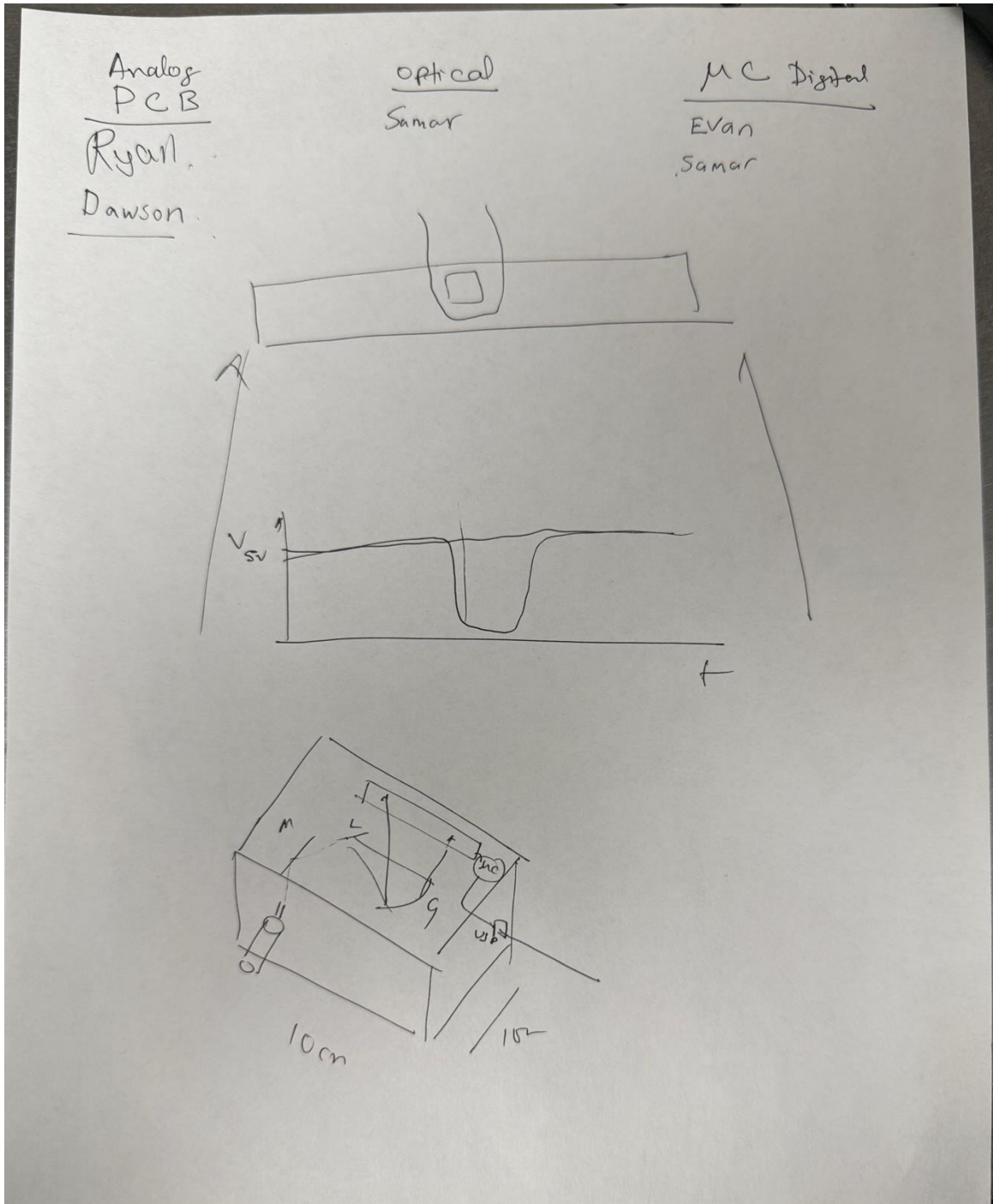


Image 2: Role Assignments for the Upcoming Week & Prototype Visualization

Pending issues

- **Deciding Meeting Time with Advisor:** We still need to synthesize a list of times when we can meet with Prof. Pramanik to discuss progress and ask for feedback. These will be sent to our advisor so that he has the option to fit our meeting into his schedule.

Individual contributions

<u>NAME</u>	<u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Ryan Majstorovic	Studied MCU and CCD data sheets. Started PCB Design	8	8
Dawson Posekany	Studied MCU and CCD functionality, PCB Design	6	6
Samar Gill	Studied Optics (Diffraction grating)	6	6
Evan Tamer	Studied MCU and CCD datasheets	6	6

Comments and extended discussion

With the career fair and classes that are picking up, we experienced some issues finding time to meet and be productive outside our advisor meeting. The team believes that this shouldn't be persistent since, now that we are getting into the thick of the project and are working on Software that can be accessed remotely, we feel like we have direction. We have also broken our team down into groups to achieve certain tasks, which helps.

Plans for the upcoming week

- Ryan Majstorovic: Design CCD driver board. Research the basics of optics for potential components in the project.
- Evan Tamer: Learn how to use Cube IDE for the MCU and determine approach for graphing measurements
- Dawson Posekany: Design driver board and research potentially useful components for the optical front end of the device.
- Samar Gill: Read the research paper and speak with Professor Kim to get an idea for the optical component of this project. Discuss the best components to get, approach to design, and any other helpful considerations.