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Subject: Project Management Assignment

Reflection

Project Management

Successes: During this last semester, the team made huge improvements in team communication and gained much success in project management. These successes that the team were able to achieve include:

- Growth in communication and collaboration over all aspects of the project
- Initiation of completing tasks towards projects
- Independent research of potential solutions and discussing validity of options in team meetings

Room for Improvements: Although the team has worked well with one another thus far, there is always room for improvement. The team must be well prepared for this upcoming semester and some of the things that could be improved for project management and team cooperation include:

- Continued communication enhancement (creation of documents and task management throughout the week)
- More initiative to start tasks early and complete them fully before the due date
- Preparation for different deliverables and using time efficiently when working towards set goals

Action Items:

1. **Check-ins/Weekly Meeting** - To further enhance the team's communication, weekly meetings will still be held with check-ins periodically to ensure that each member remains on task, improving project management within the team.
2. **Motivation/Self-Evaluation** - Managing not only each other's motivation towards completing tasks but our own motivation as well is key to keeping morality high within the team and maintaining a good performance level.
3. **Plan/Manage Time** - To work towards goals more effectively and efficiently, the team will work to better plan out our weeks as well as manage our time throughout the days towards working on the project, overall improving project management.

Remaining Design Efforts: The team has nearly completed the design process for the spectrometer system and plans to finish near the beginning of the semester. The last few remaining design efforts the team needs to finalize include:

- Optic system or mirror layout of the design to accurately diffract the required light spectrum within the given wavelength range (350-1000nm).

Gantt Chart

For the upcoming spring semester, the team created a new Gantt chart, which can be viewed in Figure 1, according to the tentative schedule provided. Each week has been laid out in sections that are color coordinated according to the team member(s) designated in completing them. According to the spring semester Gantt chart, the project management and engineering calculations summary will be completed within the first couple weeks. The team will then finalize optic design and begin production nearing the end of February when we will have our first website check. Testing will be done near the end of March, and the final CAD/model will be assembled in April. The results from testing as well as the final report will be completed along with the second website check mid-April and the final presentation at the end of April. The team hopes to then hand off the device for future applications in the beginning of May. If all goes according to plan, the team is sure to complete each assignment in an effective and efficient manner.

Spectral Forest Gantt Chart

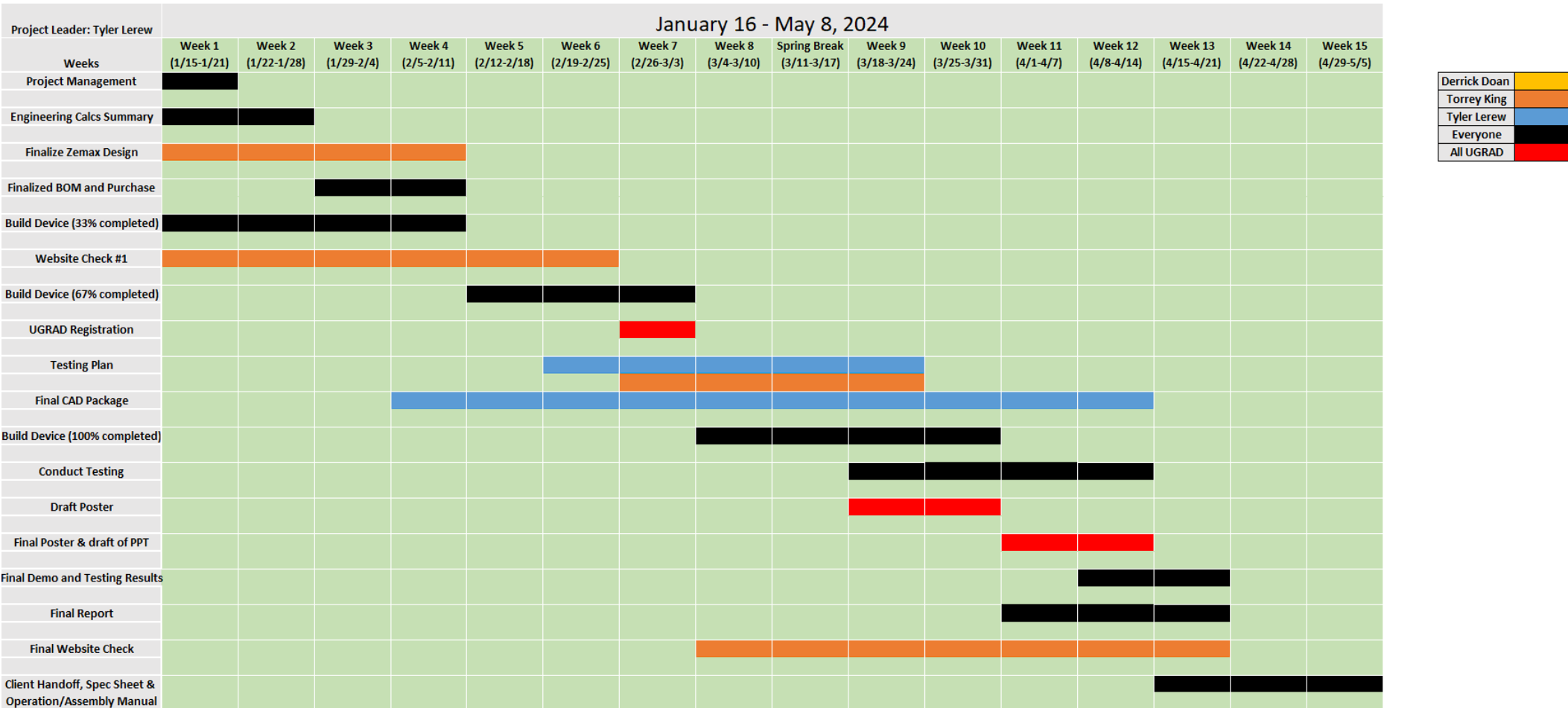


Figure 1: Spring Semester Gantt Chart

Purchasing Plan

Table 1: Bill of Materials: Purchased Items

Item #	Item	Item Description	Vendor & Part #	Quantity	Cost \$	Cost Per unit \$	Purchase or Manufacture	Weight [oz]
1	Polycarbonate CF filament	Filament that is used to print our device	Amazon	6	293.94	48.99	Purchase	N/A
2	18-8 Stainless Steel Button Head Hex Drive Screw	8-32 Thread Size, 3/8" Long	McMaster-Carr #92949A192	100	7.16	7.16	Purchase	.25
3	18-8 Stainless Steel Button Head Hex Drive Screw	3-48 Thread Size, 1/2" Long	McMaster-Carr #92949A900	100	10.10	10.10	Purchase	.25
4	18-8 Stainless Steel Flanged Button Head Screw	4-40 Thread, 1/2" Long	McMaster-Carr #97654A343	10	7.88	7.88	Purchase	.1
5	Medium-Strength Steel Coupling Nut	Zinc-Plated, Grade 5, 1/4"-20 Thread Size	McMaster-Carr #90977A130	1	5.67	5.67	Purchase	.25
6	Plastic Submersible Cord Grip	NPT Threads, for 0.39"-0.55" Cord OD, 1/2 Knockout Size	McMaster-Carr #69915K57	1	4.99	4.99	Purchase	1
7	UV-Resistant Thick-Wall PVC Pipe for Water	4 Feet Long, 1/4Pipe Size	McMaster-Carr #5066K38	1	13.60	13.60	Purchase	1
8	18-8 Stainless Steel Coupling Nut	8-32 Thread Size	McMaster-Carr #90268A009	3	6.84	20.52	Purchase	1
9	18-8 Stainless Steel Coupling Nut	3-48 Thread Size	McMaster-Carr #90268A204	4	11.00	2.75	Purchase	1
10	18-8 Stainless Steel Coupling Nut	4-40 Thread Size	McMaster-Carr #90268A205	4	13.12	3.28	Purchase	1
11	Chemical-Resistant Viton® Fluoroelastomer O-Ring	3/16 Fractional Width, Dash Number 362	McMaster-Carr #9464K624	1	14.52	14.52	Purchase	.1
12	Oil- and Abrasion-Resistant Polyurethane O-Ring	3/16 Fractional Width, Dash Number 347	McMaster-Carr #9558K348	1	17.31	17.31	Purchase	.1
13	Cosine Corrector	25.4mm Dia., 3mm Thick, ISP Optics CaF ₂ Infrared (IR) Diffuser	Thor Labs WG41050	1	101.03	101.03	Purchase	1.06
14	Diffraction grating	Richardson Gratings 1200 Grooves, 25 x 25mm, 400nm, Plane Ruled Reflection Grating	Thor Labs GT25-12	1	124.60	124.60	Purchase	0.96
15	Collimator	25.4mm Dia. x 25.4mm FL, VIS-NIR Coated,	Edmund optics	1	47.00	47.00	Purchase	1

		Plano-Convex Lens	#62-599					
16	Focusing Lens	25mm Dia. x 25mm FL Protected Aluminum, Concave Mirror	Edmund optics #43-465	1	46.00	46.00	Purchase	1
17	Round Lens Mount	SM1-Threaded Kinematic Mount for Thin Ø1" Optics	Thorlabs KM100T	2	152.54	76.27	Purchase	3.84
18	Kinematic Rectangular Optic Mounts	Kinematic Mount for 1/2" Tall Rectangular Optics, Right Handed, 8-32 Tap	Thorlabs KM05S	1	78.33	78.33	Purchase	3.84
19	Silicone	Chip Quik Electronic Grade Silicone	Digi Key #EGS10C-20G-ND	1	4.95	4.95	Purchase	.5
20	USB-C Rubber Seal	Würth Elektronik CONN COVER FOR USB-C	Digi Key #732-11387-ND	1	.63	.63	Purchase	.1
21	USB-C Panel Mount Connector	Panel-Mount USB Cord	McMaster-Carr #4872N19	1	13.17	13.17	Purchase	4
22	Plasti Dip	11 oz. White General Purpose Rubber Coating Spray	Home Depot	1	8.98	8.98	Purchase	.5
23	Plasti Dip Flexible	Protective Rubber Coating Black 11oz Spray Paint	Walmart	1	7.88	7.88	Purchase	.5
24	Foam	Fill PVC pipe so only air can pass through and nothing else	McMaster-Carr #1298N4	1	14.69	14.69	Purchase	.1
25	Latex balloon	Will be attached inside box to PVC pipe	Walmart	1	1.00	1.00	Purchase	.1
26	Silica pellets	Will be inside box to absorb any moisture in the air	McMaster-Carr #2189K16	10	8.84	8.84	Purchase	0.21
27	3D printer	Used to print the final product	Amazon	1	400-600	400-600	Purchase	N/A
28	Diamond backed nozzle	Used to print the CF filament	Amazon	2	190	95	Purchase	N/A

Table 2: Bill of Materials: Manufactured Items

Item #	Item	Item Description	Vendor & Part #	Quantity	Cost \$	Cost Per unit \$	Purchase or Manufacture	Weight [oz]
1	Final 3D printed device	Will house all internal components	In house	1	N/A	N/A	Manufacture	~1.2lbs
2	Prototype device	Will be used for testing purposes	In house	1	N/A	N/A	Manufacture	~1.2lbs
3	Prototype device	Will be used for testing purposes	In house	1	N/A	N/A	Manufacture	~1.2lbs
4	Prototype device	Will be used for testing purposes	In house	1	N/A	N/A	Manufacture	~1.2lbs

Action Items:

1. **Identify similar items to be purchased together** – This is self-explanatory, looking at the BOM the team will identify what items fall into similar categories and should be purchased together for easy assembly when the time comes.
2. **Creating a strict plan for purchasing** – The developed Gantt Chart will be followed closely to keep the team on track for purchasing. Due to the uniqueness of our project, we are getting all our items purchased through the space grant so once we finalize the lens selections, we will send the BOM over to be purchased all at once. Once we have all the items needed to complete our project, we will assemble the prototypes and then spend most of our time testing and making any necessary changes. This way we will have plenty of time to acquire new parts and implement them into the final version device.

Manufacturing Plan

Action Items:

1. **Assign assembly roles and a timeline** – Again due to the uniqueness of this project we may not be manufacturing anything ourselves we may be having someone else print our device, but we may use our grant funds to purchase a 3D printer and print all our prototypes and final design ourselves. All other purchases needed to complete our device will be done by the holder of the grant funds. We will define who will assemble each part of the assembly which will be just one or two members as the device is not overly complex. The assembly will be on a very tight schedule many weeks ahead of ME 486C so we have to time to make sure it works and if not, we will have time to make a correction and implement it.