

# EML2322L Frequently Asked Questions

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## Design Report 1 (Concept Generation)

- 1. How much detail is required on my conceptual design drawings?** This is clearly explained in the *Conceptual Design Generation* section of the [Design Report Template](#). After reviewing that material, you can refer to the [Report Examples](#) on the course website for feedback on drawings others have submitted for similar assignments in past semesters; however if you copy any of their work, you will receive a zero for the course assignment.
- 2. I'm not very good at hand drawing. Why can't I draw my conceptual design using CAD software?** The short answer is because we need the practice. When working at an internship or in industry you will often need to graphically communicate ideas. Many times you won't have the luxury of waiting until you return to your desk to use CAD tools. Therefore, it's imperative for each of us to become proficient at hand drawing. You may be asked to draw something in an interview as well, so use this assignment as intended: an opportunity to improve a valuable skill.
- 3. My robot is larger than 8-½" x 11", so how can I draw this to scale?** Drawing your robot to scale means **each** part of your robot is properly proportioned. The scale used should be clearly stated on each drawing. You must still include explicit dimensions, as instructed in the [Design Report Template](#).
- 4. Johnny Procrastinator didn't create a conceptual sketch. Am I going to lose points because of this?** Each student receives an individual grade on the first design report based on the work submitted; therefore, one person not submitting all of their conceptual drawings will not directly affect the others' grades. However, a poor or absent submission detracts from your group's ability to arrive at a good solution to the design project (since you now have one less idea to choose from), so it WILL have an indirect adverse effect on your group's success. This is why any students who receive < 60% on DR1 will fail the course per the instructor's discretion.
- 5. What is the purpose of the required page lifters and how can I obtain them?** [Page lifters](#) prevent the first and last pages in 3-ring notebooks from folding over and ripping out over time. You can buy page lifters at most office supply stores, or you can ask about them in lab, as we usually have some leftover from the previous semester.

## Design Report 2 (Selection of Design Concept)

- 1. I don't want to throw my teammate under the bus, but (s)he isn't contributing as much as our other team members. What should I do?** Talk with your TA and Mike, start using the [Group Meeting Templates](#) during your meetings (if you're not already doing so, as every group is required to do) and **be sure to fill out** the [Interim Peer Assessment](#) in the Design Report Template. The course project is too much work for someone to get the same grade as the rest of your group if (s)he doesn't invest equal effort. If the person received less than 60% on DR1, (s)he is likely going to fail the course anyway, so make sure you talk to Mike about the proper way to handle the situation.
- 2. How do we know if we have enough objectives in our evaluation matrices?** Each factor that affects your design choice should be included in the matrices. Each matrix should have five or six objectives. Four objectives are too few and seven or more are not usually necessary.
- 3. Do we have to perform motor torque calculations for every motor on each of our conceptual designs?** Your group must perform and report motor torque calculations for every motor used on your *final* design, since those are the only ones which matter.
- 4. We can't create matrices for the mobile platform, bucket manipulator, and ball hopper / sorter mechanism since these subsystems are not separable in some of our designs. Can we just have two decision matrices?** No. You should have separate matrices for each part of your design, but you can compare the highest average scores from two matrices if necessary.
- 5. Should the qualitative score assignment table be shown on the same page as the matrices?** Yes. But if that is not possible due to formatting, include it on the next page.
- 6. Which design do we choose if two designs are tied?** If the two designs are not virtually identical, select another objective to add to the matrix as the tie breaker.
- 7. The highest scoring design in one subsystem isn't compatible with the highest scoring design in another subsystem. What do we do?** Try to come up with a new hybrid design that uses the two highest scoring designs. If after a few honest hours of brainstorming you cannot come up with a new design that combines the two concepts, talk it over with a TA and then clearly explain the dilemma in the design report and select the second best design combination.

**8. How much does the checklist affect our grade?** The checklist is the grading rubric used to evaluate your decision matrices, so it has a MAJOR impact on your grade. If the checklist wasn't important, it would not be provided because your time is important. Items marked incorrect when your TA provides feedback on your first two matrices will be harshly penalized if not corrected prior to your final DR2 (or DR3) submission(s).

## Design Report 3 (Detailed Design)

- 1. Can we use print the OTS part drawings provided on the website in our design report or do we have to create our own?** You are encouraged to use the lab's drawings to allow you to focus on the parts you are designing. Our drawings also provide a good reference for making proper detailed part drawings. If you use our drawings, do not edit the drawer or designer name(s) in the title block, however feel free to change the drawing number(s) if you so desire.
- 2. Do personal parts brought into the lab (as opposed to purchased from the lab or outside vendors) count against the budget cost limit?** No: parts brought into the lab do not count against the budget as long as they are noted on the group's budget document. If you do bring in parts/materials, you are able to take them home at the end of the project.
- 3. Can we use 3D printed parts on our design project?** Since this is likely the only experience over 50% of the students coming through our Department will obtain in traditional manufacturing processes, the use of 3D printed parts is strongly discouraged. Instead of using 3D printed parts, we want you to modify your design to take advantage of the manufacturing resources provided in the lab (milling, turning, sheetmetal, welding, etc.). If a design cannot be modified in this manner, talk with your TA or Mike for an alternative suggestion, as explained in the course [3D Printing Guidelines](#) document. If an alternative solution cannot be quickly identified, then the use of 3D printing will be allowed; however, there will also be an associated cost (as noted in the guidelines document above). The second reason 3D printed parts are strongly discouraged is because threads in plastic are very weak and typically fail in use since plastic has a relatively low yield strength.

## SolidWorks

- 1. How do I create another sheet? I keep getting an error message that says, “The sheet format could not be located.”**
  - a. Right click the sheet in the Feature Manager Design Tree (by default, to the left of the display area)
  - b. Select “Copy”
  - c. Right click in the open space below the sheet in the Feature Manager Design Tree
  - d. Select “Paste”
  - e. Select the option you desire (often “Move to end”) and click “OK”
  
- 2. How do I edit the title block or drawing notes location manually? How do I adjust the tolerances?**
  - a. Right click the sheet area (not the title block)
  - b. Select “Edit Sheet Format”
  - c. Edit as desired (NOTE: when moving the drawing notes, be sure to select all notes and move them together. Allowing the title block to be directly editable when the title block is double clicked, required the notes to be broken into many text boxes in the templates.)
  - d. Right click the sheet area (not the title block)
  - e. Select “Edit Sheet”
  
- 3. If my version of SolidWorks prints a large educational watermark in the lower left quadrant of each drawing, how do I move it into the page border, as required for the course? See “Moving the SW Watermark into the Drawing Page Border” link under [SolidWorks Resources](#) on the course website. All drawings submitted in class should have no watermark or the watermark must be placed in the page border using the instructions linked above.**
  
- 4. The SolidWorks educational watermark is not appearing. Is this OK? Yes. Ideally, no drawings have the watermark; however, as long as the watermark is in the page border and not over the drawing sheet (i.e. you printed to pdf rather than saved to pdf) you will not lose points. This often happens when files are printed from a boot-leg copy of SolidWorks, a computer that previously had a full version of SolidWorks installed, or when using certain Macintosh computers.**
  
- 5. Some or all of my dimensions are gray when printed. How do I fix this? See “Black Versus Gray Dimension Lines” link under [SolidWorks Resources](#) on the course website.**

6. **How do I hide or show tangent edges?** See “Hide or Show Edges in SW Part Drawings” link under [SolidWorks Resources](#) on the course website.
  
7. **What is a good method for relabeling BOM part names?** When generating BOMs in SolidWorks, it is often necessary to relabel part names so they are more descriptive. For example, a fastener part model downloaded from [McMaster-Carr](#) or [3D Content Central](#) might have a part name that is not very descriptive (i.e. "92000A420") that you need to change so it fulfills the requirements for class (i.e. "1/4-20 x 1.5" hex head bolt").
  - a. Open part file
  - b. Select the Configuration Manager tab in the Feature Manager Tree Area to the left of the screen (by default)
  - c. Click on the configuration (under “part name” Configurations) twice as if it were a file on your computer you want to rename
  - d. Rename the configuration to the part drawing number (i.e. EML2322L-###)
  - e. Right click the configuration
  - f. Select “Properties”
  - g. Fill out the description appropriately (i.e. 80/20 Extrusion – 1" or ¼-20 x ½ BHCS)
  - h. Check the “Use in Bill of Materials” checkbox
  - i. Under Bill of Materials section, change to drop-down menu to “Configuration Name”

## Fasteners

1. All frequently asked questions are currently answered in the [Intro to Fasteners](#) lecture notes.

## BOM

1. **Is there a good example BOM I can look at for reference?** Yes, refer to the excellent [Mobile Platform Assembly Drawings and BOM Example](#) linked under [Report Examples](#) on the course website.
2. **For the BOM, can I skip balloon numbers or does every number have to be present?** Balloon numbers must always appear in sequential (or at least monotonic) order and be unique to each part; however, numbers may be skipped if doing so improves communication or better facilitates the design process. In practice, skipping numbers allows for inserting new parts into BOMs during testing and revision.
3. **Must I have a master BOM or are small BOMs on all my assembly drawings sufficient?** Sub-assembly BOMs are sufficient for the purposes of this course, as long as every part is shown in its appropriate location. A master BOM is useful to many teams (and virtually all real companies) for organizational purposes.
4. **Must BOMs appear on the same page as the related assembly drawing?** No, but they must appear as the page following the assembly drawing if the BOM is not included on the same page.
5. **Can I print larger B-sized sheets (11x17") for clarity and to reduce the number of smaller assembly drawings needed to clearly describe my design?** Absolutely; but fold larger pages so they fit nicely in the design report notebook.
6. **Does the Coriolis effect really change the swirl direction of water in a toilet depending on the location with respect to the equator 😊?** This is an odd question which has nothing to do with this course, but [let me Google that for you](#) anyway!

## Miscellaneous

1. **What is the difference between a fillet and chamfer?** A fillet is a rounded feature (📐) while a chamfer is a flat feature (📐). Fillet is pronounced like fill-it, NOT fill-ay (which just makes one hungry 😊).
2. **Why don't we use GD&T in EML2322L?** Two systems of dimensioning and tolerancing exist: traditional and geometric. Traditional dimensioning and tolerancing (TD&T) works quite well for simple parts, but becomes cumbersome when applied to complex parts. Geometric dimensioning and tolerancing (GD&T) is exactly the reverse: it is cumbersome when applied to simple parts and is excellent for more complex parts. Proper use of either D&T system requires a solid understanding of tolerances associated with modern manufacturing processes, which is one of the core topics covered in EML2322L. Due to the relatively simple nature of the parts designed in this course, TD&T is a better choice because it is much easier to understand given our limited experience levels.
3. **I can't find the document I want on the website...** As much as we strive to organize the information on the website, sometimes it is still challenging to find documents. Google has the ability to search a particular website for keywords. If, for example, I wanted to find the SolidWorks drawing templates required for this course, I would search:

[solidworks drawing templates site: http://www2.mae.ufl.edu/designlab](http://www2.mae.ufl.edu/designlab)

Note the search modifier "site:". Here are some additional [search tips and tricks](#).