PCB Layout

ECE 401 - Homework #6

Due: Week #12

1) Create a detailed schematic using Fusion360

- You must use Fusion360. Kicad and other programs are not allowed
- Reference Designators must be shown on all parts
- All reference designators in a uniform and readable position.
- Text should not overlap the reference designators.
- Show values of all components.
- Schematic must have text showing Project Name and Project # (ex. SD401-Sp22-xx)
- Generate the bill of materials from Upverter
- Test points should be available for measurement {9V, 5V, ground, Input, Output, and Collector(s)}

The schematic must be saved and printed using Fusion360 both as a

- Schematic PDF
- High Res Schematic PNG

2) Once your schematic is approved, create Gerber files

- Using Fusion360

Your PCB must be

- 2.000" x 2.000"
- Mounting holes 200 mils in each corner
- Power & Ground Traces: 40mils
- Ground plane on the bottom side of PCB
- Other Traces: 20mils
- Silk-Screen designators in correct order
- Board must show the project name & team designation (SD401-F22-XX)
- (Font15 recommended for font size)

Send pdf, PNG, the bill of materials, and Gerber files to Jeffrey.Erickson@ndsu.edu for verification.

Note: In ECE 401, you have some constraints that will be lifted in ECE 403/405

	ECE 401	ECE 403/405
PCB Size	2" x 2"	up to 60 square inches
Mounting Holes	200 mils	200 - 250 mils
Ground Plane	yes	yes
Power Plane	yes	Depends upon design
Trace Width: Power	40 mils	8 mils to 600 mils
Other Traces	20 mils	8 mils to 600 mils
Test Points	yes Through Hole	yes Surface Mount or Through Hole
Components	Through Hole	any (0805, TSOP, DIP recommended)
Silk Screen (top)	yes include date & group number	yes include date & group number
Silk Screen (bottom)	no	yes if components placed on both sides of board
Font Size	50 mil or larger height/10 for thickness	50 mil or larger height/10 for thickness
Digikey Trace Width Calculator	optional	Longest trace with highest current
LEDs	5mm Through Hole 10mA current Power, Signals	Any size, any number 0805 recommended Power, Signals
Power	9V battery 7805 to step down to 5VDC	any
Fuse	1 Ohm resistor Add reverse polarity protection	optional