# Week 1 Submission Group: 19

Word limit=1000. Use bullet points and be concise. Cite reference

# Project Update: 1 point

1. What is the purpose and task in this step?

Define the problem and create the problem statement. In addition to this, the group needs to create a project plan, assign team roles, and determine conflict resolution procedures.

We need to properly define the problem so that all the future steps in the project can be carried out more effectively; there is a lower probability that we will have to return to step 1 during the iterative process.

1. What did you achieve in this step?

In this step we described our plan for the desk-top CNC soldering machine. The plan included a timeline for the completion of the design brief, when the following steps should be completed, and what those steps include. Design considerations, constraints, and success criteria for the defined problem were brainstormed for use in the design brief.

The meeting time of 12/1 – 2pm every Wednesday was set for discussing progress updates, task assignments, future steps, and any issues concerning the project. Team roles were assigned for each member as well as conflict resolution procedures for various situations.

# Homework: 1 point

1. Describe your project plan, such as project title, scope, delivery, novelty/ significance/ impacts, time schedule/weekly plan, team roles, rules, resources, risk mitigation, etc. Particularly, what rules would you follow to solve issues/ confliction, such as sick leave, individual contributions, inactive members, etc.? When and where to meet?

<https://knowhow.ncvo.org.uk/your-team/people-management-skills/teams/effectiveteam/roles>

<https://www.mindtools.com/ahlzx36/resolving-team-conflict>

<https://www.mindtools.com/pages/article/newTMM_79.htm>

**Desktop CNC Soldering Machine**

**Project**

**Context**

Designing a desktop CNC soldering machine for use on PCBs and microchips. The stakeholders in this project are the team members of this project. The CNC machine must be made with the limited materials provided as well as materials bought from a small budget.

**Design considerations and constraints**

* Size of the CNC soldering machine.
* Size of the PCB/object being soldered.
* Easy to assemble and disassemble.
* Extra materials must stay within our budget.
* Accuracy of the soldering iron / movement system (motors etc.).
* Weight of the components (e.g., soldering iron).
* Safety: electronic parts, mechanical/moving parts, the soldering iron itself.
* Operating conditions: Size of desk, location of operation.
* Maintainability.
* Longevity.
* Integration of mechanical and electrical components.

**Success criteria**

* Accurate movement so that it can solder individual components of a PCB without overlap or damage to the PCB.
* Smooth movement.
* Simple mechanical movement systems.

**Project plan**

**Step 1**

* Do research on CNC soldering machines: investigate existing models, look at research on google scholar, consult experts.
* Determine the context of the design.
* Determine constraints and success criteria.
* Determine what we are designing for (DfX).
* Create SMART goals/objectives.

We need to use the above information to construct a design brief which will include a problem statement, the success criteria, and the problem constraints. This should be completed before Monday the 24th of July.

**Step 2**

Once we have a design brief, we should move onto step two of the engineering process: generating solutions and ideas. There should be at least 3 final solutions to choose from at the end of the week starting Monday the 24th of July. Ideally as many solutions as possible will be generated from the research, design brief, and given materials.

Start modelling the given components in CAD so that we can integrate them into the design solutions. This should be finished by the end of step 3.

**Step 3**

* Use an appropriate tool (such as a decision matrix) to choose a solution out of the ones from step 2.
* Create bill of materials and assembly instructions.
* Develop any technical drawings and use CAD to model final design.

These processes should be finished by the end of week 3.

**Step 4**

* Create a prototype of the CNC soldering machine and test its operation - set up electronics.

**Step 5**

* Evaluate the final design. Can it be improved in any way? Is it fit for purpose, does it comply with all the constraints, and does it meet all the success criteria?

**Step 6**

* Present our final design.

**Problem statement:** Design a CNC soldering machine that is accurate, smooth, easy for the operator to assemble and disassemble, easy to transport, and fits on a desk. The machine must also be constructed from the materials provided or bought from a small budget.

**Administration**

**Meetings**

* Time: 12/1 – 2pm on Wednesday
* Location: MECH214 Mechatronics lab / Eng core
* More if needed.

**Conflict resolution procedures**

Group members not participating in group meetings.

* Determining the reason for their lack of participation, if the reason is unjustified then talk to the lecturer and inform them that one of the group members is not participating. If the absence is justified, then the other group members can inform them or summarise what happened in the meeting so that they are up to speed.

group members not carrying out their assigned tasks.

* Determining the reason for their lack of contribution, if the reason is unjustified then talk to the lecturer and inform them that one of the group members is not participating. If they are finding the assigned work difficult or are having trouble with it, then the group member should reach out to the project manager and ask them to re assign the roles so that everyone can contribute effectively.

harassing others in any manner.

* Major – inform the lecturer.
* Minor – having a group meeting to discuss the behaviour and how to move forward.

**Team roles**

* Reuben: Project leader
* Jack: Project manager
* John: Project coordinator
* Lucas: Project administrator

# Weekly Individual Contributions

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Contributions | Mark | Signature |
| Reuben Smitheram | Thoughts and filling in Submission 1 | 2 | Reuben |
| Jack Edwards | Thoughts and filling in Submission 1 | 2 | Jack |
| John-Luke Fenn | Thoughts and filling in Submission 1 | 2 | John-Luke |
| Lucas Kwan | Thoughts and filling in Submission 1 | 2 | Lucas |
|  |  |  |  |
|  |  | Sum=2\*N |  |

N: number of group members. Every group member is expected to take part in the whole process, not just work on one part, for example, report writing only.