Protocol Laboratory: Electrical Engineering #1

Hochschule Rhein-Waal

Rhine-Waal University of Applied Sciences

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Course name:	Laboratory: Electrical Engineering
Group:	C
Faculty:	Communication and Environment
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Study questions

Question #1.1 – What types of tin-solder are available?

There are 2 types of tin-solder:

- Lead-free solder. Like the name suggests, has no lead (chemical symbol: Pb) in it.
- Lead solder.

Question #1.2 – What is meant with RoHS?

RoHS is short for: Restriction of Hazardous Substances Directive.

This directive restricts the use of certain hazardous substances in electrical and electronic equipment.

Question #1.3 – What temperature is needed for soldering?

Most solder melts from 180 °C to 190°C.

So, the soldering temperature we need on our soldering iron should be around 250°C.

Question #1.4 – What is the difference between leaded and lead-free tin-solder?
A leaded solder requires less temperature to melt compared to lead-free-tin solder.

The surface of the leaded solder joint after cooling down is shinier compared to lead-free-tin-solder.

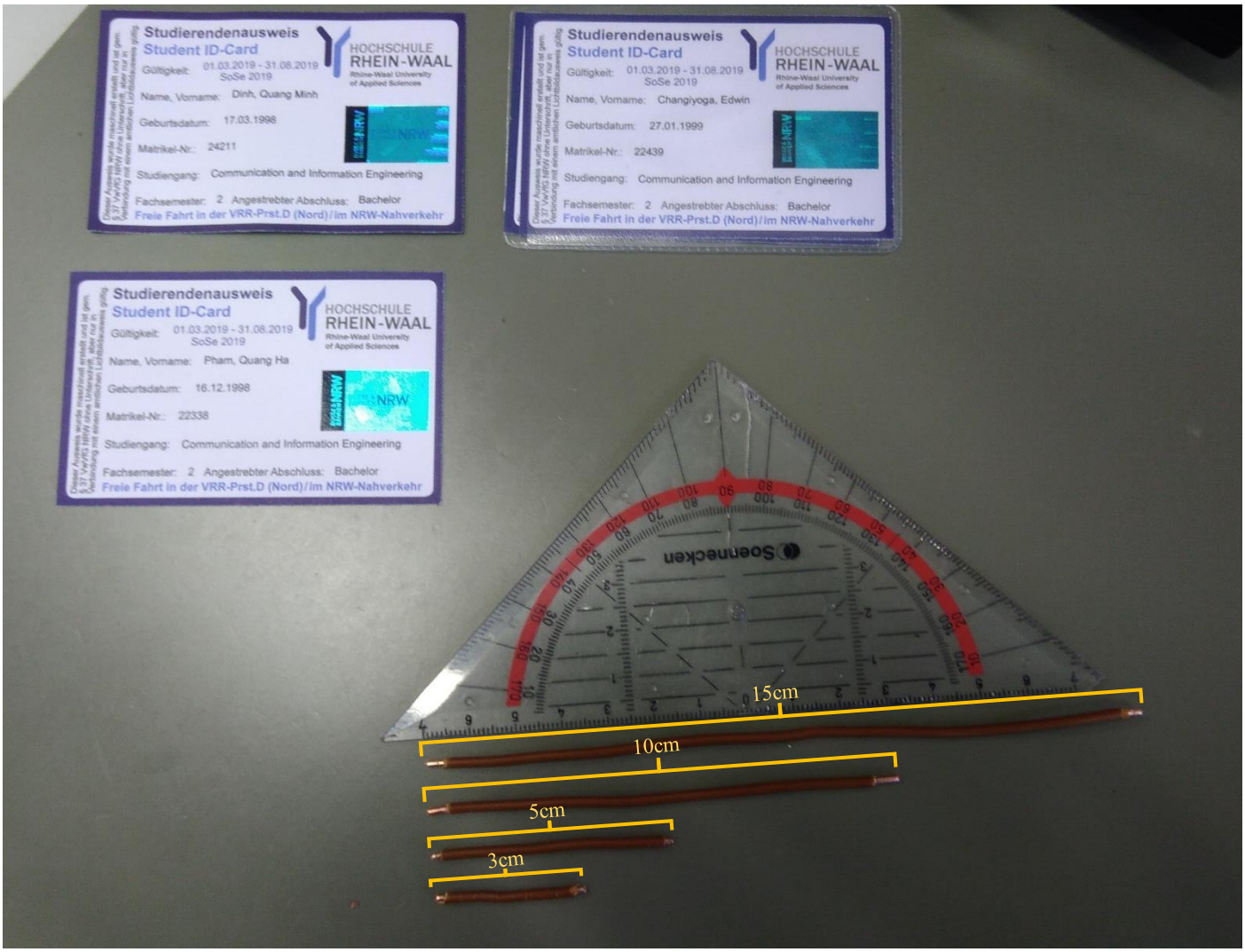
Challenge #1

Abstract:

We used the wire-cutter to cut 4 pieces of cable with the 4 measurements as required in the booklet. After that we have to remove the thick rubber exterior of the cable before we can strip off the isolation of the wire.

Then we used the wire-stripper to strip 5mm and 2mm isolation off of both ends of 10cm and 3cm cable respectively. We repeat the wire stripping procedure to strip 5mm and 2mm isolation off of both ends of 15cm and 5cm cable respectively, but this time we used the wire-cutter instead of the wire-stripper. We felt that using the wire-stripper to strip off the isolation is much easier than using the wire-cutter.

Pictures:



Challenge #2

Abstract:

Our group found out that we can turn on the soldering station by flipping the switch to ON position. We can also adjust the soldering iron temperature by twisting the temperature knob in front of the soldering machine. However, we have to wait for a little bit before the soldering iron can reach its temperature from a cold start, for that we found out there is an LED on the front of the soldering machine that will blink when the soldering iron has reached the specified temperature.

Challenge #3

Abstract:

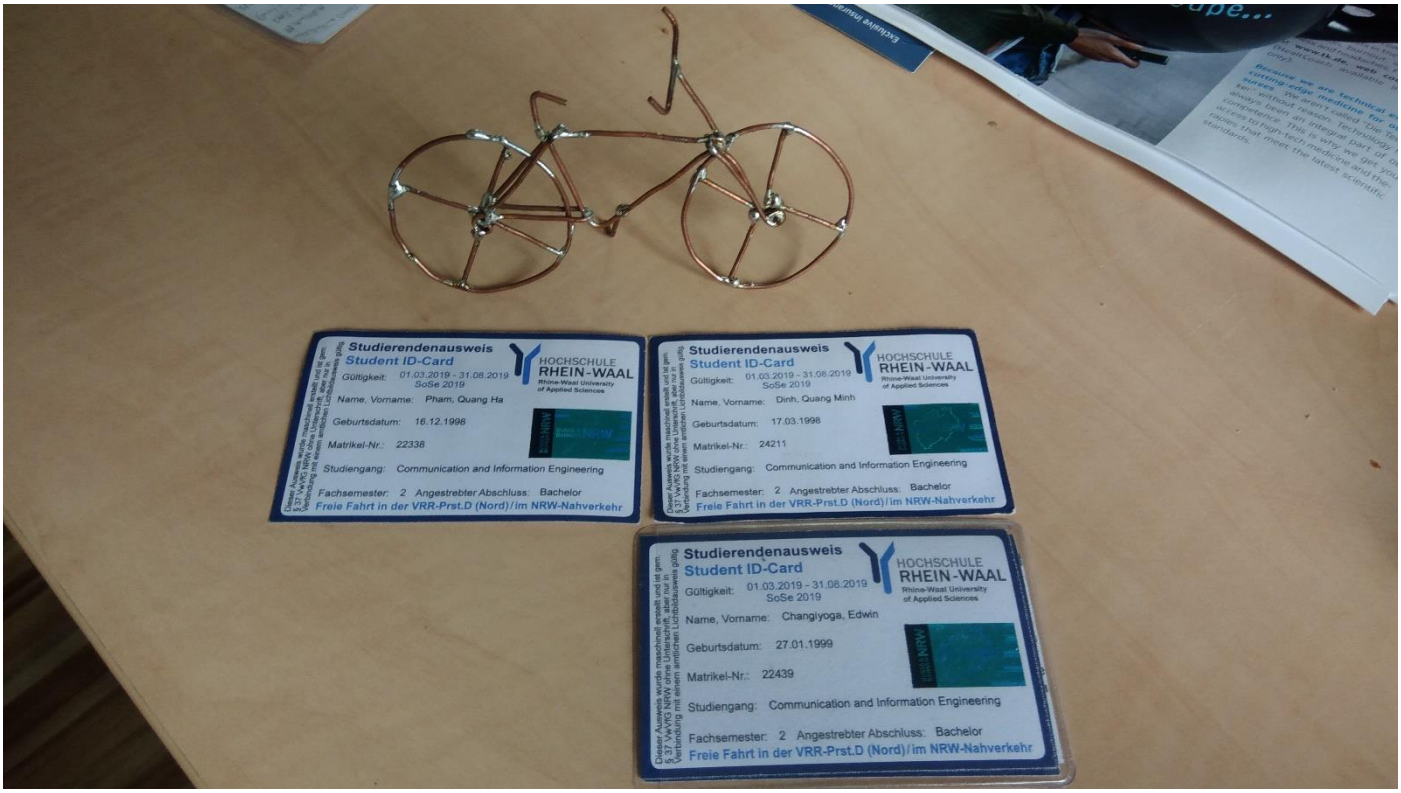
Using the knowledge that we got from challenge 1, our group managed to gather the wires as specified in the booklet and bend them into shape by using pliers.

For the wheels of the bicycle, we have to bend the wire so that it resembles a big circle first, then we solder the two ends of the wire together to hold the circle in place. Then we use 8 of the 2cm wires to make two crosses to put in the middle of the bike wheels and connect the cross with the wheel by soldering.

After that we make the bicycle body by soldering the remaining stuff slowly on to the big triangle piece that we have bended, except for the handle bars because they will prevent us from laying the bicycle body flat on the table.

Finally, to get the complete bike we laid the wheels and the bicycle body flat on the table, then we push the wheels in between the bars connecting the body and the wheel and solder them together. After everything was done, we connect the handle bars to the rest of the components to complete the bicycle.

Pictures: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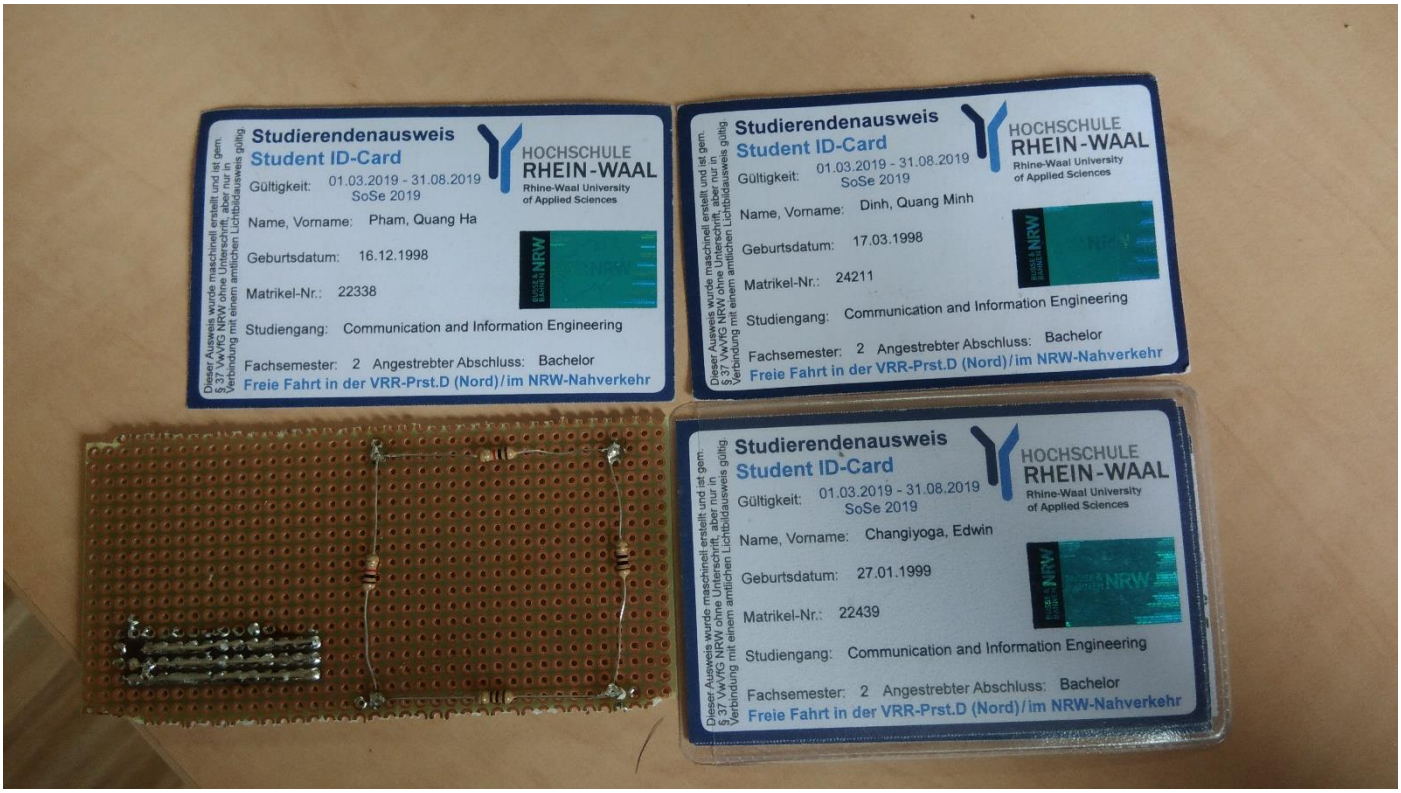
Challenge #4

Abstract:

To make a track on a PCB, first we solder one hole at a time to form a line of dots. Then we solder in the gaps between the solder joints we just made to fill it up. After that we solder some finishing touches to create the illusion of a line of solder on the PCB board, but in reality, it is just a series of little solder dots connected together.

Pictures:



Challenge #5

Abstract:

We start by twisting the three legs of the transistor to make it into one leg, because we think it will be easier to solder that way. Then we complete the body by soldering the arms, legs, body and head of the little man together. We made the weights separately by twisting the two diode's legs together and solder it. To complete the little man, we twist the two arms into the weights handle bars and solder them together to create a connection.

Pictures: