



# Projects TE1

Second Semester 2020



# General Instructions

The projects have to be done in the groups ALREADY established in class. The date to present this report is October 12<sup>th</sup>/13<sup>th</sup> (The first of these two days in which you have class).

Only the coordinator or one representative of the group will upload the following documents to the UEDI Platform activity associated with this project:

- 1. A text editor document:** This is the digital report in Microsoft Word and a PDF format following the structure and requirements specified in this text.
- 2. A slide presentation:** This is a digital presentation in Microsoft PowerPoint developing the topic that has been chosen from this text.

You will choose **ONLY ONE PROJECT PER GROUP**, which is the one according to the dominant career of the members of your group. For example, in a group of 5 people, if you have three chemical engineering students you have to make the chemical engineering project because of the majority of members from that career. If there is a tie (empate) of the number of members (two dominant careers, for example 2 industrial, 2 chemical and 1 mechanical) choose in consensus one of the two careers that tied.

The following rubric must be included in the **second page** of the work.

Presentation	/ 15
Introduction	/ 15
Objectives (1 general and several specific)	/ 20
Investigation (framework)	/ 20
Conclusions	/ 25
Annexes	/ 5
References (APA Style)	

For this project, the following style and content of **cover page** has to be used:



## Environmental Engineering

### Environmental Laws in Guatemala (Option 1)

**Objective:** To learn and explain the most important environmental laws in Guatemala

**Activity:** To investigate and understand the environmental laws in Guatemala.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate the different types of environmental laws that exist in Guatemala.
- Each group will state the importance of these types of laws in Guatemala.
- Each group is going to investigate different enterprises that controls that these laws are applied in Guatemala
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed)
- A brochure may also be included summarizing your investigation.

## Technical English

### Environmental Engineering (Option 2)

- Subject: Environment
- Topic: Environmental problems
- Objective: To know the major environmental problems, their causes, effects and strategies to prevent them.
- Description: The project consists on researching an environmental problem. For example: air pollution, overpopulation, water pollution, etc.

For it you should interview people with a survey (10 questions and 10 surveys). For example, these questions can be:

- How the problem affects you in an everyday basis?
- Can you contribute in preventing this problem?

As part of your project you should include a “manual” where you explain the problem’s causes and effects and what strategies can be implemented to decrease its impact.

- Procedure:

The students are going to develop a Manual with the strategies that can be implemented to decrease the impact of the environmental problem with images, showing the causes and effects. The purpose is to show, through a presentation done in Power Point how to prevent the problem. The process must be described in a clear way in English and the students will also have to explain the causes, effects and one example of a real case in Guatemala.

- Students will present also a written investigation about the environmental problem they choose, and this must include:

1. **Index**
2. **Introduction**
3. **Objectives (1 General and 3 specifics)**
4. **Environmental problem’s Manual**
5. **Conclusions (coinciding with the objectives)**
6. **Annexes (surveys)**
7. **Bibliography**

- In the same way, the students have to present a VIDEO explaining the Environmental problem and the prevent strategies.

## Mechanical and Mechanical Industrial Engineering

### Choose one of the following topics

#### Thermal Treatments (Heat Treatment in metals)

**Objective:** To learn and explain the different types of thermal treatments in metals.

**Activity:** To investigate and show how thermal treatments are applied in metals.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate the different types thermal treatments in metals.
- Each group will explain each type of thermal treatment and how they are applied to metals and how their mechanical properties change.
- Each group is going to investigate different enterprises that do this kind of work in Guatemala.
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed)
- A brochure may also be included summarizing your investigation.

#### Thermochemical Treatments

**Objective:** To learn and explain the different types of thermochemical treatments in metals.

**Activity:** To investigate and show how thermochemical treatments are applied in metals.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate the different types thermochemical treatments in metals.
- Each group will explain each type of thermochemical treatment and how they are applied to metals and how their mechanical properties change.
- Each group is going to investigate different enterprises that do this kind of work in Guatemala.

- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed)
- A brochure may also be included summarizing your investigation.

## **Civil Engineering**

### **Choose one of the following topics**

#### **Types of Steel**

**Objective:** To learn and explain the different types steels.

**Activity:** To investigate and explain the variations of carbon in steel.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate the different types thermal treatments in metals.
- Each group will explain each type of thermal treatment and how they are applied to metals and how their mechanical properties change.
- Each group is going to investigate different enterprises that do this kind of work in Guatemala.
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed).

- A brochure may also be included, summarizing your investigation.

## **Hardness Tests and Mechanical Properties**

**Objective:** To learn and explain the different types of hardness test

**Activity:** To describe the different hardness test and explain the different mechanical properties.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate the different types of hardness test.
- Each group will explain the mechanical properties of materials.
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed).
- A brochure may also be included, summarizing your investigation.



## **Destructives Test and Nondestructive Test**

**Objective:** To learn and explain the different tests that a material can undergo.

**Activity:** To investigate and explain the destructive and nondestructive tests.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate the different types of destructives tests.
- Each group will investigate the different types of nondestructive tests.
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed).
- A brochure may also be included, summarizing your investigation.

## Electric, Electronic and Mechanical Electric Engineering

### Electromagnet

**Objective:** To learn and explain how an electromagnet works.

**Activity:** To investigate and make an electromagnet lighting a bulb.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate how an electromagnet works and describe it.
- Each group will make a sample of it working.
- Each group will investigate how this can be applied to engineering
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed).
- A brochure may also be included, summarizing your investigation.

## Science and System Engineering

### Installing an IDE

**Objective:** To investigate, install and display an IDE in a computer.

**Activity:** To learn how to install an IDE and display a window where mathematical functions are done.

**Description:**

- To make groups of 3 to 6 students
- Each group will investigate how to install an IDE.
- Each group will create a tutorial on how to install an IDE.
- Each group will create a window displaying mathematical functions such as addition, subtraction, division and multiplication.
- The window need to create another window showing the answer, a close button, a create button.
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
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- A brochure may also be included, summarizing your investigation.

## Industrial and Mechanical Industrial Engineering

### Statistical Report

**Objective:** To learn and explain how excel can be used for statistical purposes.

**Activity:** To go out in the field and create a survey and pass it on into the clients of a cafeteria and report their results.

**Description:**

- To make groups of 3 to 6 students

- Each group will create a survey with 10 questions asking them how they grade the service, the food and what will they want or expect in a cafeteria.
- Pass the survey at least to 20 persons in 2 different cafeterias.
- Each group will report the results in excel creating a graph per question and explain thus giving recommendations if possible of the results.
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- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**
  - **Conclusions**
  - **Annexes**
  - **References**
- A power point presentation is also required where this will only contain necessary information (images, tables, graphs, long texts are not allowed).
- A brochure may also be included, summarizing your investigation.
- A copy of the survey must be included in the report and the groups need to show during the presentation the surveys pass onto the clients.

## Chemical Engineering

### Chemistry Labs Instrumentation

**Objective:** To know the instrumentation used in the labs

**Activity:** To investigate the name and usage of the different instruments used in chemistry labs of the school of engineering.

**Description:**

- To make groups of 3 to 6 students
- Each group will research at least 6 different instruments used in the lab, how to use them, the margin of error of each instrument and other important issued about them.
- Each group will explain the different instruments; they will prepare posters, banners with the pictures and explanations of all of them.
- The students will write a written report that includes the following:
  - **Front Page**
  - **Index**
  - **Introduction**
  - **Objectives**
  - **Investigation**

➤ **Conclusions**

➤ **Annexes**

➤ **References**

- A power point presentation is also required where this will only contain necessary information (images, tables, and graphs, long texts are not allowed).
- A brochure may also be included, summarizing your investigation.