

## Instruction Manual for “The Flying Dutchman” Project

‘Flying Dutchmen’ are go-karts with alternative propulsion systems. They are usually homemade from wood, steel, etc. A Flying Dutchman typically has a well thought-out, unique but strikingly simple design.

### Table of Contents

#### General

“The Flying Dutchman” project

- Design module 5 - 1.5 study points
- Drawing module 5/6 - 1.5 study points
- Business module 6 - 1 study point
- Dutch language module 6, “Presentation” - 1 study point

Work placement assignments:

- BPV module 5.1 - 3 study points
- BPV module 5.2 - 3 study points
- BPV module 6.1 - 3 study points
- BPV module 6.2 - 3 study points

Practical assignments:

- Machining module 5 - 2 study points
- Non-machining module 5 - 2 study points

Theory modules:

- Pneumatics module 5 - 1 study point
- Materials module 6 - 1 study point

Other:

- LLB module 5/6 - 2 study points
- Careers counselling module - 1 study point

Outside N@tschool

- Arithmetic - 2 study points
- Physics - 1 study point
- Dutch - 1 study point

Total: 30 study points

30 study points corresponds to an average study load for one semester (half an academic year) with a normal level of effort.

## Introduction

This instruction manual is a summary of several modules in the engineering programme for supervisory staff.

### Modular instruction

Modular instruction exposes you to other aspects which nowadays are required at school, in addition to the technical issues.

You are now part of a project group. You must hold work discussions in small groups. You often work according to a step-by-step plan. Since communicating and cooperating are important competencies, you will usually distribute the work amongst your group and help one another to find solutions.

Together with your careers counsellor, you discuss what exactly has to be done and take decisions in that regard.

It is important that you know what requirements have to be satisfied in completing a task as well as when the work has to be completed.

All of your work, whether fully or partially complete, is kept in a project room at N@tschool.

There are supervisors and instructors who can provide you with support and assistance in the learning process.

What should you be able to do?

- talk in a group;
- follow a step-by-step plan / project plan;
- work independently;
- consult sources of information.

## Step-by-step plan

The execution of each project can be divided into parts which we call modules. These modules can stand alone, but it is a lot more fun to combine them into a coherent whole!

Together with your careers counsellor, you determine the order of the activities.

### Step 1

Together with your careers counsellor, produce an overview setting out precisely what has been agreed about your project, such as what is expected of you, when the project must be completed, when the interim evaluations are, etc.

### Steps 2, 3, 4, etc.

As long as the project or module has not yet been completed, you will meet with your careers counsellor every week to show the progress you have made (in N@tschool!!) and to receive tips and comments about your work. To a large extent, you determine your own speed and progress.

### Step 5

If Step 5 is your last step, you will use it to complete the individual modules and/or the project.

A module can be completed in various ways, such as by means of a diagnostic test or a well-written report (sometimes both!). The requirements are not open to debate – they just depend on the module in question!

Once all modules have concluded, the project has been completed.

## Portfolio

You put all the assignments to be carried out in N@tschool. The supporting instructors evaluate the work done and, during a reflection interview, they will use your portfolio to determine whether you can proceed with the following modules (or project).

During the reflection interview, you will have the opportunity to explain your activities and how you carried out those activities.

## The structure of an extract (or report)

The goal of an extract is to present information in an easy-to-understand form. The extent to which this goal is achieved depends in part on how the extract is structured. A good extract is easy to read and is a good tool for mastering the learning material.

### Cover sheet

Every extract must have a cover sheet. The cover sheet provides the information that is important to the reader at a glance. The cover sheet must therefore always state:

- the title or the subject
- the name(s) of the author(s)
- the date when the extract was submitted
- etc.

The title page can be made more attractive by using drawings or images, as long as this is not at the expense of clarity (by which we mean that each part of the title page must remain clearly legible).

### Introduction

The introduction is important to both the reader and the author. The introduction informs the reader about the subject(s) covered by the extract. For the author, writing a good introduction helps him or her to fully understand the goal of the extract.

Please note: A good introduction can also be short! -

### Conclusion or summary

The summary is intended for the readers of the extract. By reading the summary, they should be able to easily understand what has been achieved by producing the extract.

Levels in our programme according to the Kenteq knowledge centre for technical expertise:

Level 3 (2-3 years) trains students to become 'technical officers'. Technical officers must be able not only to carry out a set of tasks independently, but also to supervise and monitor colleagues. The focus is on expanding professional skills.

Level 4 has two types of programmes: 'supervisory staff' (3-5 years) and 'specialists' (postgraduate course lasting 1-2 years). Supervisory staff can perform a wide range of activities and carry out their work entirely independently. The programme offers the opportunity to deepen your business and economic expertise for management positions in a particular field.

A qualifications file can lead to one or more job profiles. By marking which core tasks and work processes the various job profiles have in common, the matrix below helps to clarify where there is a relationship between the various profiles and where they differ.

The following is an overview of the core tasks for the "engineering" programme (Level 4).

Core task 1: design products or systems

1.1 Collecting and processing design data:

The professional checks whether the design data delivered (e.g. a Programme of Requirements) is satisfactory. He investigates the needs of a target Group, and he brings in experts where necessary. He processes and registers the data according to the applicable operating instructions. He talks to the customer and his manager to verify whether the recorded design data are complete and accurate.

1.2 Developing designs in detail

The professional develops design data into (partial) designs or product ideas according to operating instructions and statutory requirements. When necessary, he uses (CAD) computer programs to do so. He points out possibilities and impossibilities and consults with internal and/or external employees.

1.3 Choosing materials and parts

The professional chooses the necessary materials and parts and, if necessary, proposes alternatives. To this end, he produces an inventory of the requirements, possibilities and wishes regarding the materials and parts needed for the design.

1.4 Calculating costs

The professional estimates the cost of implementation as a reference point for a quote. He draws up an overview of the total costs and the costs per item. He consults with other departments and his manager about the estimate. He records agreements regarding implementation costs.

## Core task 2: Preparing production work

### 2.1 Collecting and processing design data

The professional finds out what data have to be available, such as lists of materials and implementation agreements. He either collects this data personally or brings in experts to do so. He processes and registers the data according to the applicable operating instructions. He checks with the customer and his manager to determine whether the recorded production data is complete and accurate.

### 2.2 Producing a drawing or a drawing package

The professional uses the production data to produce a complete drawing package consisting of working drawings and lists of materials. He consults the design and project specifications in order to do so. He discusses the contents of the working drawings and the degree of detail with his manager and/or the construction team.

### 2.3 Organising people and resources

The professional specifies the number of man-hours, the amounts of materials, parts and resources necessary to produce the product. He categorises the amounts in numbers and units, where necessary with specifications. In consultation, he determines the phases, order of implementation, use and availability of equipment, materials, people and resources and records this information in a work schedule according to the applicable company rules. He reports the results to his manager.

## Core task 3: Supervising production work

### 3.1 Supervising the production process

The professional discusses the production process with production employees and gives them advice, instructions and explanations. In the event of problems or delays in implementation of the work, he looks for an appropriate solution in consultation with his manager.

During production, the professional keeps track of the current status of the work and compares this status to the schedule. He records any deviations from the schedule and evaluates the consequences. Where possible, he looks for alternatives or solutions. He discusses the modified schedule with his manager and he communicates the consequences to those involved.

### 3.2 Monitoring the budget

The professional processes invoices and bills from suppliers for a project. He checks amounts, performances and deliveries and, in the case of excess expenditure, he consults management or work preparation staff. He makes proposals regarding action to be taken. He keeps a record of additional or reduced work and deductible amounts in agreement with his manager.

### 3.3 Carrying out quality controls

The professional ensures that a project is implemented according to the company's quality system. He gives instructions accordingly if this is not the case. He also records compliance with standards, regulations and quality requirements according to the company's quality management system.

### 3.4 Delivering work

The professional supports the delivery of work to the customer by working with his manager in the handing over of the work to the customer. He records the fact that the work has been carried out according to specifications so that it can be officially completed.

## Core task 4: Maintaining products and systems

### 4.1 Inspecting and testing products and systems

The professional inspects and tests products and systems, or has tests and checks performed, in order to assess the quality of these products and systems. These tests are conducted with a view to both preventive and corrective maintenance. The professional reports results, proposals and/or recommendations.

### 4.2 Optimising products and systems

The professional carries out repairs (in some cases temporary repairs) to products and systems based on a maintenance assignment. To do so, he analyses and locates failures based on information and observed abnormal performance. He carries out modifications as specified in modification descriptions. He tests and checks the work performed. He discusses the potential inconvenience caused by his activities with the customer.

We will re-enter these “variables” in a “configurator” which should provide the necessary reference basis for designing and building a Flying Dutchman.

The final result is a Flying Dutchman according to your own specifications.

We will build Flying Dutchmen in small groups in Phases 5 and 6 of our project. They don't have to look old-fashioned – they can be modern as well!

Before you begin building, you need a good idea of what the Flying Dutchman should look like. We therefore have to make agreements in that regard and stick to them.

The project consists of a number of modules which all relate to the Flying Dutchman. These modules can also stand alone, but in a project you see that they are connected to each other!

We will not be working with a project space in Periods 5 and 6. -

The modules that relate to this project are:

- Phase 5 Design
- Phase 5 Drawing
- Phase 5 Business
- Phase 5 Materials
- Phase 5 Machining
- Phase 5 Non-machining
- Phase 6 Dutch language, presentation

The order of the modules does not matter! The guideline for the duration of this project is six months. All parts must be completed within those six months.

Work can begin after the guidelines for the Flying Dutchman have been established for each project group. The drawings are produced in the drawing lessons. Instead of waiting until the drawings are ready, we begin building a "prototype" immediately. We incorporate the things learnt while building the prototype into the drawings so that they constantly improve. The business component concerns the cost of the Flying Dutchman: How much does the material cost and how many hours of work will be involved? How much does mass production cost? Etc. This project will focus more on the Construction module than the Machining module because there is significantly more construction work in this project. At the end of the project, the Flying Dutchman has to be presented. The Dutch language lessons will cover how this presentation is to be given.

Buying wheels and pedals is permitted. If necessary, the wheels of a baby buggy or something similar can also be used.