Level A: Constructing the three flor elevator

Task Details

TASK

Task Authors: TEACHER / MENTOR

Date: 25.02.2010

Task Type: Product / constructing

Programme: Mechatronic operator

Related Tags:

Time Resource: half year project

Frame Work Verbs:

Mechatronics is a science which combines three important technical fields: electrotechnic, machinery and ICT. Renovated program for mechatronic operator consist of 17 modules from which 7 are general and 10 professional.

Goal of learning situation is connection of different professional modules within programme Mechatronic operator.

Pedagogic Aim – Summary

Our task has the title: Making of personal elevator model.
Chosen task relates to desired goal because there are integrated professional modules within: technical communication in profession, materials and their handling in profession, using controlling devices, designing and testing of mechatronic systems and some content from other modules which together form unique unit. Result of all that is useful learning tool.

Learning outcomes

During the process of designing and production of the product students get important skills, knowledge and competences useful for their further study and work.

- Production and using technical documentation
- Using modern ICT tools for technical documentation production
- Search in different catalogues to find new components or combinations
- Get acquainted with good communication among colleagues and managers
- Get acquainted with working place settled with order
- Get acquainted with different materials
- Get acquainted with different technologies and ways of handling material
- Get acquainted with the meaning of accuracy and preciseness
- Work with different machines and tools
- Learning of hand skills
- Get acquainted with basic laws of electrotechnic
- Working with instruments
- Connecting electrical components
- Recognize usage of controlers
- Recognise different types of switches – sensors
- Learning of programming

Section One

Information for Teacher/ Lecturer

Task Description: Description of task – steps

- Teacher identify the basic requirements and details for the elevator.
  (height of the lift, No. stores, drive type, controller type which is available ...)
- Students using the internet looking for ideas and gather information.
- Students draw a basic sketch of the lift with the dimensions and the essential requirements.
- They choose type of materials and looking for corresponding components.
- Determine working steps, the functions of individual team members and the time frame
- Calculations
- Drawing of components.
- Inventory and order of needed material and other components.
- Production of component assemblies
- Assembly - assembly of mechanical components.
- Mounting and connecting electrical components.
- Executing of electrical control scheme.
- Wiring controlers and other components.
- Programming controllers.
- Tests of activities and operation - elimination of possible errors.
- Completion of construction and demonstration activities.

Task instructions: Instructions for students ... ... sketch, diagram, working material .....

Technical Communication: Using an internet students review possible existing examples, ideas and concepts. They study collected ideas and decide for solution that will be performed.

Technical Documentation: Students freehand draw a sketch of the lift. Based on the drawings, requirements and calculations, they decide on appropriate materials and components. Based on the drawings, components and requirements available they calculate all other necessary technical data, such as lifting speed, maximum load, etc.. Students regularly produce the appropriate documentation. With adequate software they draw elementary components and produce drawings, parts lists, and supplements that are needed to order materials.

Manufacture of main component parts: in workshops students produce main components on the basis of previously drawn documentation. They get acquinted with different materials and gaining experience in the processing thereof. Milling, turning, drilling are the basic technological processes in the formation of individual assemblies and subassemblies. In practical work on the machines they get the feeling for working environment, learn about the importance of maintaining machinery, etc..

Fitting: Fitting of manufactured components is an important step in the formation of the product as it is here that show different problems and errors that have occurred in the very process of formation of parts. Students learn concepts such as precision, accuracy, aesthetics, etc. working environment.

Production of electrical schemes and control integration: Knowing the basics of electrical engineering are essential for understanding the operation of electrical machinery and appliances, as well as the elevator. Students produce lift control scheme by using the knowledge of electrical engineering and control engineering. Correctly drawn diagram is a condition for the proper wiring, which is the next step in the creation of lift.

Controller Programming: Is a very interesting part, where students meet with de modern approaches in creating controls, such as simulation of action, modern computer programs and also an associate language skills and understanding of engineering standards.

TESTING:

PRESENTATION:

Evaluation Criteria: Setting minimal standards.

Evaluation of individual steps achieved by students.

Section Two

Deliverable(s): Anexes (pictures, sketches, drawings, films)

Reference Material: books, magazines,literature, articles, web…..

Activity /Workshop: Type of activity; experiment, guided work, team work, project etc.….

Section Three

Quality Control

Content Checked By Control over students – teachers, mentors

Comments: Comments on execution, support (mentor, teacher), additional instructions

Section Four

Activity sketch, plan, technical description

Personal experiences

Supervision and control of the process, work

EXPERIENCE	NAME	BRIEF DESCRIPTION
Description and evaluation of individual steps		
Choosing the theme and argumentation		
Technical documentation – machine part		
Production of individual parts – working procedures		
Fitting - accuracy and preciseness		
Documentation – electrical part		
Wiring – considering standards, harmonical working and aesthetics		
Testing – abolition of mistakes		
Presentation, demonstration of project working		

BACKGROUND MATERIAL …. Direct to already prepared product like examples.