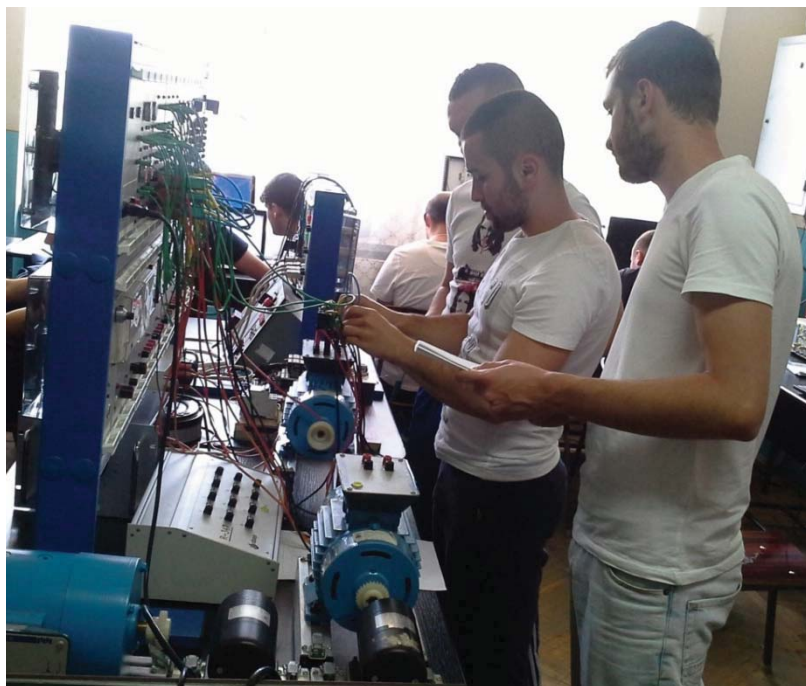


## PROJECTX N° 008

# “STARTING OF THE INDUCTION MACHINE”

## PRESENTATION



**Promoting school:**

University of Pitesti  
Pitesti, Romania



## A. GENERAL DESCRIPTION

### Title of the ProjectX

**STARTING OF THE INDUCTION MACHINE**

### Core area

GENERAL / KNOWLEDGE      **ELECTRICITY**

PARTICULAR / ACTIVITY:      **MAINTENANCE OF INDUSTRIAL ELECTRICAL INSTALLATIONS**

### Promoting school

UNIVERSITY OF PITESTI

### Schools participants in the revision of the ProjectX

LYSEE ISAAC NEWTON  
XABEC

### Reference to ECVET Credit System and EQF / NQF

ECVET	EQF	REFERENCE TO NATIONAL QUALIFICATIONS (NQF)						
		Spain	Finland	Romania	Portugal	UK	Turkey	France
1	4	4	4	3	4	3	4	4

### Learning Outcomes achieved (to be developed in the future related with ECVET credit system)

1. (TOPMOST: ELYAS07) Analyse the electric schematic for starting an induction machine
2. (TOPMOST: ELYAS06) Perform electrical installations and electrical maintenance for industrial
3. (TOPMOST: ATMAS04) Install programmable automated systems
4. (TOPMOST: ATMPL01, 04) Write simple PLC program for sequential control systems

### Time that is necessary to do the ProjectX (in hours)

Theory:      10 hours  
Practice:      20 hours

### Link to real companies in your region (it is just informative)

- |                           |                    |
|---------------------------|--------------------|
| 1. NAME: DACIA RENAULT    | WORKPLACE: PITESTI |
| 2. NAME: JHONSON CONTROLS | WORKPLACE: PITESTI |
| 3. NAME: METABET          | WORKPLACE: PITESTI |



## B. THEORY

### Objectives of the theoretical Knowledge

1. Read electrical installations drawings
2. Connect different electric apparatus in order to have a functional schematic
3. Program a PLC

### List of activities

1. Read the manual (provided by the teacher as electronic document – pdf)
2. Evaluation questionnaire
3. Drawing the schematic

## C. PRACTICE

### Brief description of the Practice

The student has to be capable to make the required electrical connections between different electric components according to an electric design  
The student has to be capable of connecting a PLC in a schematic and develop a simple program

### Steps or activities to be performed by the student

- |             |  |
|-------------|--|
| First:      | Read the technical documentation   |
| Second:     | Analyse the correctness of the schematic   |
| Third:      | Start to make connections between the required electrical apparatus according the schematic – command part |
| Fourth:     | Check the correctness of each step of the implementation of the schematic – command part                   |
| Fifth:      | Start to make connections between the required electrical apparatus according the schematic – force part   |
| Sixth:      | Check the correctness of each step of the implementation of the schematic – force part                     |
| Seventh:    | Connect the PLC in the schematic   |
|             | a.        Inputs   |
|             | b.        Outputs  |
| Eighth:     | Check the correctness of the PLC connections   |
| Ninth:      | Program PLC  |
| Tenth:      | Check the correctness of the program   |
| Eleventh:   | Run the program with the command schematic on and the force schematic off                                  |
| Twelveth:   | Run the program with the command schematic on and the force schematic on                                   |
| Thirteenth: | Final documentation  |



#### D. DETAILED DESCRIPTION OF LEARNING OUTCOMES.

<b>Learning Outcome:</b>	<b>(TOPMOST: ELYAS07) Analyse the electric schematic for starting an induction machine</b>
<b>Knowledge</b>	
-	To know the electrical symbols used in electric schematics
<b>Skills</b>	
-	Understand the function of schematic for starting electric motors
<b>Competences</b>	
-	Cognitive competence: to be able to read an electric schematic
-	Functional competence: to be able to analyse the function of a basic electric schematic
-	Personal competence: to be able to communicate with team members when analysing a schematic
-	Ethical competence: to be able to work in team

<b>Learning Outcome:</b>	<b>(TOPMOST: ELYAS06) Perform electrical installations and electrical maintenance for industrial</b>
<b>Knowledge</b>	
-	To identify the appropriate terminals of involved components in the force and command schematic
<b>Skills</b>	
-	Perform connections in the command and force schematics. Use the appropriate tools to detect a defect in a schematic: voltmeter, ohmmeter and ammeter
<b>Competences</b>	
-	Cognitive competence: to identify the appropriate terminals of the electric apparatus
-	Functional competence: be able to wire different apparatus in the schematic. To be able to connect in an electric circuit basic measurement apparatus: V, $\Omega$ , A
-	Personal competence: to be able to communicate with team members when analysing a schematic
-	Ethical competence: be able to work in team



<b>Learning Outcome:</b>	<b>(TOPMOST: ATMAS04) Install programmable automated systems</b>
<b>Knowledge</b>	
-	To identify the terminals of a certain PLC and the required voltages' levels to be applied
<b>Skills</b>	
-	Perform connection to the PLC terminals according the schematic
<b>Competences</b>	
-	Cognitive competence: to identify the appropriate terminals of the PLC using the manual
-	Functional competence: be able to wire different terminals of the PLC according the schematic
-	Personal competence: to be able to communicate with team members when analysing a schematic
-	Ethical competence: be able to work in team

<b>Learning Outcome:</b>	<b>(TOPMOST: ATMPL01, 04) Write simple PLC program for sequential control systems</b>
<b>Knowledge</b>	
-	To be able to understand basic instructions to program a PLC
<b>Skills</b>	
-	To be able to use basic instructions to program a PLC
<b>Competences</b>	
-	Cognitive competence: to identify different visual basic symbols used in PLC programming
-	Functional competence: be able to use visual basic instructions for PLC programming
-	Personal competence: to be able to communicate with team members when analysing a schematic
-	Ethical competence: to be able to work in team

