Abstract: This paper aims to propose a solution for the graduation student from Materials Science and Engineering, Engineering and Sciences of Environment and Industrial Engineering to become specialists with cognitive competences, practical – applicative and also with communication skills and behavior relationships. To reach this aim we projected a master degree in the field of environmental protection in materials industry.

Key-Words: behavior relationships, communication, competences, skills.

1 Introduction
Nowadays, at internal as well as international level, engineering contributes, with an important percentage, to the society progress and ensuring the environmental and life quality, an engineer being considered as a “change manager”. Thus, the establishing of the educational needs in accordance with economical needs and ensuring the resources destined to their fulfilling suppose a correct evaluation of these ones. The superior educational system assessment by establishing the role and the dimensions of the specialty in the national as well as European context suppose a major joint action of the ministry and university. Also, a correlation between recent approved specialty and the qualification nomenclature that will be established in accordance with the one existent at European level.

The Bologna process implementation in high level education supposes:

- specialty adjustment function of the scientific progress, economical and social;
- specialities correlation with the qualification, function of work forces requirements;
- establishing of the specific competences which will be able to exercise the graduate student of a particular field;
- curricular design: proposal of courses on a common branch on a specialty knowledge comprising: basic courses, course for engineering formation and optional courses [1].

Thus by implementing the Bologna Process, we propose encouraging and increasing of the young people especially, the interest for engineering field that can be realized also by changes in the educational system in order to obtain a more attractive one, in accordance with the tendencies manifested nowadays.

An important role should be carried out for continuous education, by the presences of the offers for the one that require the qualification and requalification, for actualizing the professional knowledge of even for a second job. In Romania the continuous formation system is in a small measure approached being appreciated at less than 2% from the high qualification personnel following this type of education in comparison with 22% in other European countries [1]. An activity like that should become good to ensure as stable as possible links with the industry and supplementary sources.

2 Master degree implementation
In this context, in our faculty a master program was developed and designed in the field of environmental protection in materials industry. With this program we intent to create a formal, rigorous scientifically based frame and also with high applicative relevance in order to form future specialists in the field of environmental protection in materials industry [2].

Specialty in this program targets the amelioration of the fundamental preparation of the graduated students based on the following coordinates:

- Knowing and application of the last generation techniques for characterization and identification of the pollutant substances;
Developing of a new recycling (recirculation) techniques of secondary materials and energetically (secondary energy resources RES and renuvable energy sources)

Conceiving and application of the modern eco-technologies in the vital sectors for fabrication and use of metallic materials;

Fundaments of processes for pollutants generation using the chemistry, physics and mathematics;

Exploitation of the industrial ecosystems based on modern informatics (optimal conducting of ecosystems and informational systems in industrial ecology);

Consolidation of the strategies and environmental policy based on the principals of the concept of sustainable development, of improving the process and products quality and amelioration of the life quality [2]. By following this program the students will achieve a set of general competences as: elaboration of a study or a scientifically report, team working skills, creative use of the general industrial ecology knowledge achieved, will develop the potential of implementing specialty knowledge on a wide profile in poliqualification systems, meaning the elastic possibility of adjusting to the changes propose by the science and techniques, will achieve the capacity to independent acting and creative problem solving, will learn to use the socio – human nature knowledge and managerial ones to increase the efficiency of the ecosystems referring to the quality life’s indicators.

Also the students will achieve a series of scientifically competences as: information and knowledge in the field of monitoring and analyze by laboratory techniques of the pollutant emissions, the ability of application of the knowledge regarding the kinetics and dynamics of the processes of scrap generation in metallic materials industry, perception at a superior level for projecting the equipments and technologies for prevention and control of pollution, developing of the engineering profile to act in the purpose of preservation of the natural capital by optimizing the engineering potential and recycling secondary materials, solid knowledge referring the operational management, environmental laws and informatics in industry of metallic materials, capacity of conceiving and operation sustainable eco-technologies in metallurgy.

Achieving the competences by students drive to the improving specific cognitive abilities supposing:

Application of the concept, theories and investigation methods fundamentals in the field of environmental protection in materials industry, for formulation of projects and professional steps;

Critical assessments of a new research, by attraction of the students in research work, using the superior endowments in the laboratories accredited according to ISO 17025;

The summarizing and interpretations of an information set skill, problem solving and evaluation of the possible conclusions;

Independent analyze of a problem and capacity of communication and demonstration of de chosen solution by alternative formulation and proofing their relevance

The capacity of complex problem assessment and communication in demonstrative way the results of the own evolution;

initiative in analyzing and solving problems.

3 Material base

To develop this master program a new, modern materials base was conceived. This will be used for didactic as well as for research activities.

The student can achieve knowledge regarding the pollution prevent and control under close supervising of the professors, in the Laboratory for pollution prevent and control [3]. This laboratory has a spectrophotometer with optical emissions type GNR METAL LAB 75 – 80 (fig.1) with a measuring spectral filed between 120 – 800 nm. The equipment is endowing with a specialized soft, on three basis (Fe, Al and Cu) and allows the quantitative analysis effected for determining chemical composition of the metallic alloys.

Fig.1 Optical emission spectrometer type GNR Metal Lab 75 – 80
Preparing samples, that will be analyzed by optical emission spectrometry, realized with the aid of two machines for cleaning the samples, one for the ferrous samples (fig.2) and one for nonferrous samples.

For achieving some information and knowledge necessary in the field of monitoring and analyzing by laboratory techniques, the students will have access in the Characterization and analysis of pollutants laboratory [3], where can be effected analyses with the aid of very good equipments as: spectrometer of atomically absorption, type GBC 932 AB PLUS (fig 3), destined for analyzing of the metal content ($\text{Fe}_{\text{total}}, \text{Ni}, \text{Cu}, \text{Pb}, \text{Zn}, \text{Cd}, \text{Mn}, \text{Au}, \text{Ca}, \text{Cr}$ etc) from water soil scraps and powder samples and a molecular absorption spectrometer type GBC Cintra5 UV – VIS (fig 4) destined for analyzing the pollutant contents present in samples of water and soil ciano type, sulphites, nitridies, phosphates.

To determine the persistent organic compound presenting a risk factor on the environment and that need pursuing imposed by the new legislation in the field of environmental protection, the students will have the opportunity to gain access in the Laboratory for characterization the environmental factors water and soil by gas chromatography and mass spectrometry. Here they can use the equipments consisting in gas chromatograph type Konik – Tech HRGC 4000B (fig 6) for quantitative analyzve and a mass spectrometer type KONIK QMASS 12 (fig 5) for qualitative analyses.
For sample preparation for gas chromatograph the students will use a rotavapor (fig 7) destined for phase separation, purification and concentration of the water and soil samples.

The students will achieve solid knowledge referring to the operationalization of the environmental law management and informatics in metallic materials industry but also the capacity of conceiving and operate sustainable metallurgical eco-technologies in the Laboratory for identification of the products of sustainable eco-technologies. Here we can identify the crystalline phases by X rays diffraction method, for every type of crystalline material, with the aid of a X ray diffractometer type Xpert PRO Philips (fig. 8).

For the elementary analyses of different types of liquid samples and/or solid (even as powders) will be used a X rays fluorescence spectrometer type S8 Tiger (fig 9).

4 Conclusions

The aim of this master program is to provide competitive work forces on a labor market. The students will achieve very good scientifically knowledge as well as they will develop their social skills. They will learn how to be creative, to team work, to communicate. The communication abilities will be well appreciated on the labor market. Also the students will learn and develop
their skills regarding time management. The professors involved in this master program will be also motivated to improve themselves and thus this master program will be completely in the line of Bologna Process.

References:
