

THE COMPUTER ENGINEERING PROJECT COURSE

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Abstract - Nowadays, with the technological progress, it is extremely important that the students begin the professional involvement early in the program, mainly envisioning their performance as future professionals and the potentialities that can be reached. This should happen as early as possible and, preferably, in the first year of the program, so that the students have a clearer vision of the program, knowing the directions that can be taken in the academic life so that they have a professional formation more adapted to their aspirations. In this direction, the Computer Engineering program, at UnicenP, already implemented in the first year, a course denominated Computer Engineering Project, which main objective is to awake the student to its formation and to the program, inducing the development of critical thought on the profession and, mainly, on the professional future. This is based on the idea that the student is a professional in training, who, after the conclusion of the program, will be entering professional life, and this insertion doesn't happen automatically, it requires professional maturity on the part of the student.

Index Terms – Computer Engineering, Projects, course, teams, future professional.

INTRODUCTION

Nowadays, with the technological progress, it is extremely important that the students mainly envisioning their performance as professionals and the potentialities that can be reached. This should happen as early as possible and, preferably, in the first year of the program, so that the students have a clearer vision of the program, knowing the directions that can be taken in the academic life so that they obtain a formation more adapted to their aspirations.

These objectives serve to motivate and to incentive that the students evolve as soon as possible. They are common to several institutions and a lot of initiatives were proposed as described in [1],[2],[3] and [4].

In this sense, the Computer Engineering program [5], of UnicenP, implemented in the first year a course denominated Computer Engineering Project, which main goal is to awake the student for its formation and for the program, propitiating the development of critical thought on the profession, and mainly as professional, that has to be tuned in with the world that is every day more global and in constant change.

THE COURSE

The course has a total of 80 hours, and it is organized in 2 weekly hours, distributed in 40 weeks which encompass two semesters.

The Computer Engineering Project Course aims to create a discovery environment on the part of the student on the program, and on the engineering in a general way. In these lines, a view is traced on the engineering in Brazil and its several branches. They are also seen the elements that compose the projects, as the norms, methodologies for the elaboration and documentation of the projects.

The main idea is that the students begin feeling as future engineers, and for this divided the 70 students' group in work teams, with at the most five students. For each one of the teams a subject was given, together with a brief description and a basic bibliography for reference. In these projects, the students accomplish a bibliographical rising on the state of the art and to position the project inside of the area of action of the Computer Engineering.

Course Content

The content of the course is divide in five groups: Introduction to the Engineering, Elaboration of Projects, Scientific Methodology, Elaboration of Documents and last the guided projects of Computer Engineering.

The course has the following objective: To study the engineer's role, its attributions, with the intention of forming a professional in the development of computational projects, through guided projects, following the whole scientific methodology, elaboration of projects and documentation.

To proceed we present the several groups of the course with the objective and basic content of each one:

- **Introduction to Engineering** - Contextualize engineering in view of computers, in the current world, the attributions of the Computer Engineering, the aspects of the legislation and the expected ethical conduct.
- **Elaboration of Projects** - To awake the students for the several necessary aspects of the elaboration of projects, such as reasoning, study methods and research, model, simulation and creativity.
- **Scientific Metodology** - To supply all the formalism that a scientific research should have by means of the scientific methodology and research.

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- **Elaboration of Documents** - To verify the several formats and norms for the presentation of research results as papers, monographs and reports.
- **Computer Engineering Projects** - In this topic the students will elaborate the first draft on the proposed theme, the research on the state of the art as well as the development of the project under the instructor's supervision. The projects integrate several courses of the program, with oral presentation (seminar) as well as practical defense.

THE PROJECTS

The projects embrace so much of Hardware aspects as of Software, with several levels of performance that depend on the complexity of the project, for example:

- **Use of the biometrics for access to computational systems** - *The biometrics is the study of the use of the characteristics of the human body, such as hands, retina, voice and etc; for its application in equipment. The idea of this work is to analyze the application of this resource type for the access to the computational systems, guaranteeing and checking the user's access.*

The Stages of the Project

The assignments must possess the following parts:

- **First Draft:** Preliminary study on the theme with the objectives, justification and necessary resources for the elaboration of the project.
- **Revision of the Literature:** Verification of the state of the art on the theme, as well as the theory on the subject.
- **Specification:** Based on the first draft and in the references, the team should make the specification of the project to be accomplished.
- **Project:** Based on the specification, a technical description of the project is made towards the physical implementation of the software and hardware.
- **Implementation:** The detailed project is implemented physically in hardware and software, using the available resources in the laboratories.
- **Results and Conclusions:** Results obtained with the implementation of the project, as tests and simulations; and also the coming conclusions of all the stages of development of the project, relating the problems and solutions that have happened.

Presentation of the Projects

At the end of the course the students should make an oral presentation, in the seminar form. They should also make the practical defense of the project for the other students and for the professors.

The presentation takes place with the all the other students' participation, professors and guests, with the

objective of providing the presenters with the opportunity to lose the inhibition of speaking in public to order the ideas so that the audience understand the project.

Documentation

Besides all the formalism in the presentation, the project has to be very well documented, and this happens by means of the monograph, obeying the norms, a project summarized in the form of paper and the manuals of the implementation and an internet page on the project.

THE ORIENTATION

The projects are developed under the professors' supervision that guide the teams in the development of its projects, from the elaboration of the first draft to the public presentation of the project, going through the physical implementation of the software, of the hardware or both.

THE EVALUATION

The projects are appraised in several stages and with several inclusion levels, from the evaluation of the first draft to the oral presentation (seminar), as well as of the physical implementation of the project.

With the project it was already mentioned it is evaluated in a gradual and continuous way, because, besides the formal presentation and of the delivery of the demanded documentation, the advisor weekly accompanies the development of the project by means of meeting with the team, where the latter should present the evolution of the project and receive the orientations of the advisor.

CONCLUSION

It was observed that the students were much motivated and also more interested, because they could know, already in the first year, a little better the course, and its field of the practice.

Besides, there was a paradigm change on the part of the students, because they could verify that is necessary a mentality change passing from a passive agent to an agent that participates actively in the learning process.

Another point that was verified is that the students developed concepts as work in teams, leadership and trust, besides the cooperation sense, that is fundamental for the development of activities in team.

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