

# INTEGRATING ICT IN DISTANCE TRAINING OF PRACTICAL ENGINEERS

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**Abstract** – The School of Technology is training practical Engineers in Electronics, Industry and Management and Software Engineering using self-study and distance learning methods. In the last few years the school has been integrating into its distance learning system a variety of ICT: Web Based Learning, “Virtual Labs” and Problem Solving self-developed courseware in areas of Control and Telecommunications. The ICT are introduced in order to update the study methods, improve the learning process and better prepare the students to the future work environment. The new methods and the pedagogic and professional considerations are discussed and analyzed.

**Index Terms** – Distance Learning, Web Based Learning, Simulation Software, Electronics, Software in Engineering, Courseware.

## INTRODUCTION

The School of Technology of the Open University of Israel is a distance learning Engineering education institution. In the past the learning methods were based on written units, home labs, computers for programming and applications, group sessions in study centers, project work assignments and semestrial examinations. In the last few years computerized and IT methods were introduced. Some of the methods came in addition to the conventional methods and others replaced some of the methods.

## ICT IN THE LEARNING SYSTEM

- **Web Based Learning** which includes the establishment of Web sites for the courses through which communication and information exchange between students and tutors take place, as well as various kinds of learning activities. The activities include learning materials, links to manufacturer’s sites, examples and updates for downloading, web based assignments and team projects. The system is asynchronous but experiments are conducted with synchronous add on software that will allow for “live lessons” on the Internet.

In some Electronics courses, problems are posed on the site, and hints and partial solutions help students reach full solutions. In some Software Engineering courses, examples, solved problems, and programs can be downloaded from the

course sites as well as summaries, main points and technical terms vocabulary which are available through the sites.

- **“Virtual Labs”** consisting of simulation software which have a data base not only of components and devices but also of measuring instruments. One can connect the instruments in circuits and systems built virtually, and measure various physical quantities with it. These virtual labs are good substitutes to the hardware labs used largely in the past. Self study experiments guides which we developed make the use of the software easy and user friendly. The fault finding is also introduced using the simulation software. Virtual Labs are used mainly in Electricity, Electronics and Digital systems.
- **Problem solving courseware** were developed by us in two main areas: Control Systems and Telecommunication. The courseware are “closed” in the sense that they respond to mistakes done by the student, but they are also “open” in that they supply many tasks and problems to be solved by the student. The interactive software uses the system approach, includes tasks and assignments and has multimedia features including audio processing.

The above mentioned methods are not only updating the study means but also improving the learning process in the distance learning system and giving the student proper computerized tools for better integration in the work environment of the future practical Engineer.

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