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**VIRTUAL LEARNING ENVIRONMENT FOR THE STUDY OF
THEORETICAL MECHANICS**

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***Abstract:** The systems management courses allow editing and controlled access to e-learning materials. Editor is used HTML. HTML code allows the use of more complex construction, associated with various programming languages, Java, JavaScript, C#, C++, which may be placed text files, PowerPoint, images, audio files, video and animation.*

The course is the result of changing syllabus of the course proper mechanics taught at the Faculty of Technological Equipment Technical University of Civil Engineering.

In the last chapter of the book - one for individual study - contains applications do so for free vibrations, as well as for those forced, with or without amortization.

Keywords: HTML, Java, JavaScript, e-Learning, On-line Learning, Theoretical Mechanics

1. INTRODUCTION

Usually e-Learning is synonymous with On-line Learning, Web Based Learning - WBT, Internet Based Learning, Technology Based Learning, Open Distance Learning, Distributed Learning.

In the definition the European Community gives, e-Learning refers to the use of new technologies and of the Internet for improving the quality of learning through access to resources and collaboration.

Here is a definition condensed and suggestive, formulated by Elliott Masie. The Masie Center - <http://www.masie.com>: "e-Learning is the use of network technology to design, deliver, select, administer, and extend learning; we need to bring learning to people instead of bringing people to learning".[1]

The analogy found at Stuff Works - <http://www.howstuffworks.com>: E-learning is to classroom learning as cell phones are to a pay phone at the bus station.

e-Learning is a form of distance education, whereas the participants and the instructor can be in different locations, and the interaction is more or asynchronous. Unlike distance education, e-learning is highly interactive, achieving interaction at the following levels:

- participant – participant;
- participant – material;
- participant - instructor.[2]

e-Learning means access to the latest information, acquiring new knowledge, continual learning, new and effective methods of learning and collaboration.

The goal of online courses is to learn how to learn, to prepare you for learning throughout life, to gain skills management knowledge, such as searching, selecting and synthesing information and solutions.

2. TYPES OF E-LEARNING AND NECESSARY TECHNOLOGIES

Each person can differently see the definition of the on-line learning, this difference coming from their own experiences.

To continue, the following types of e-learning will be presented, from the description of their characteristics also resulting the necessary technologies:

- Individual study;
- Collaboration with a teacher;
- The virtual classroom;
- Study incorporated in activities;
- Online mentor. [2]

2.1. Individual study

What this model tries to achieve is a support based on experiments, for those who are trying to study individually, for self-educated men.

The content of such a system consists in web pages and multimedia presentations stocked on a web server and accessed through a browser. This way of studying is better than the computer based training where the courses are generally offered on a CD-ROM, because the one who studies can be tested and followed through stocking their actions in a database. But those who study are independent, there is no teacher but only steps that have to be taken. There are still mechanisms through which the participants can communicate with one another.

2.2. Collaboration with a teacher

This e-learning type is based on the web resources offered in learner-led e-learning, also using the facilities offered by the collaboration with a teacher. The teachers who collaborates, doesn't impose his working manner but just answers the questions and helps by giving solutions to the problem's which may appear all the time. The teacher can assess the student's level.

2.3. The virtual class

The model "the virtual class" uses the web technologies to produce conventional studies, in classrooms, for those who study at distance. A variety of technologies is used: video and audio conferences, chat, the application share, vote mechanisms virtual whiteboards.

The teacher presents slides and sustains various demonstrations. Those who study have the possibility of asking questions and receiving answers, either via chat windows or via e-mail. There is also the possibility of some audio conferences, but it is limited by the connections speed.

The main obstacle in such an e-learning method is the tape breadth (the speed at which data can circulate through connection in a second), reason why the video conferences are more rarely used on the internet, this being a solution adopted in case the course may take place in a local network, which offers the necessary bandwidth.

2.4. Study incorporated in activities

This type of learning is useful for the persons who have problems which urgently need being solved, like using a certain product for example.

It often refers to the help files which can be found in the computer programs or from networks, but it can also be an EPSS component (Electronic Performance Support System).

These objects are usually associated and installed together with the programs.

For situations in which the help file is much bigger and the user decides not to install it on his PC, this can access the tutorial existent on Web.

2.5. Online mentor

It combines the use of the latest technologies for teaching with the remotest form of teaching. There are used video-conferences, the instant transmission of messages to help mentors guide their students. Relationships based on a mentor's existence tend to become long, joining the entire period of a career development.

3. THE E-LEARNING PLATFORM

The access to a certain course can be restricted using of accounts and passwords (Fig. 1 and 2).

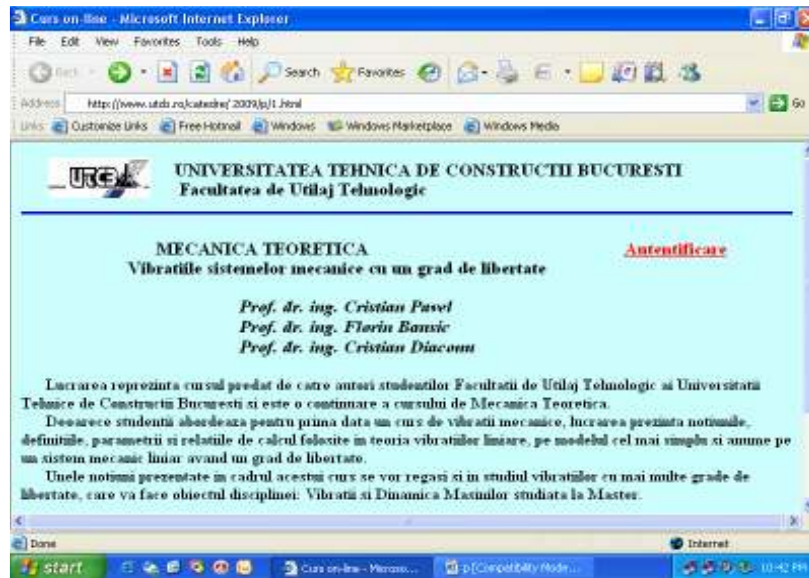


Figure 1: Link to login



Figure 2: Authentication accounts and passwords

The program contains the following modules: information, calendar, students, forum, chat, tutorials, platform administration (Fig. 3).

3.1. Information

At a department level there is a page which contains the latest news. For each announcement ad can display the date, title and content. To read them one can enter a site and make a link to obtain announcements in RSS format, with the help of a RSS program READER.

3.2. Calendar

To highlight the main events a calendar may be introduced, through which the course days, the exam days and even the meetings with teachers or other events can be watched.



Figure 3: Platform modules

3.3. Students

For better knowledge of the course colleagues and for better communication in this page the students and their e-mail addresses are introduced.

It is also from here messages can be transmitted to the addresses selected by every student depending on whom they are addressed to.

3.4. Forum

The forum allows the user's communication with the teacher. The moment the user enters the forum he sees the number of questions and answers received for every domain. When selecting a domain, then a question the user can see all the answers to that question. After selecting a question, this can be erased or modified. In the user's case these operations are permitted just for their own questions.

3.5. Chat

This type of communication permits sending short messages among persons working in the network; the messages are stocked on a server until they are received. This service can be compared to the e-mail, with the difference that communication is synchronous here, the messages appearing automatically on the involved person's screen. This way of communication is useful for organizing conferences between two or more users, in the conditions of a bandwidth of limited tape.

3.6. Tutorials

The editor contains the most used elements for creating a course, options to add files on the site as well as the possibility to introduction HTML code if the use of some more complex constructions is wished. [3], [4]

The files that contain these lessons can be as: text, HTML, Power Point.

The tutorial page contains a set of lessons divided in chapters (Fig. 4, 5). [5]

When checking the level of understanding the presented information can be done with the help of a final self-assessment test or with points.

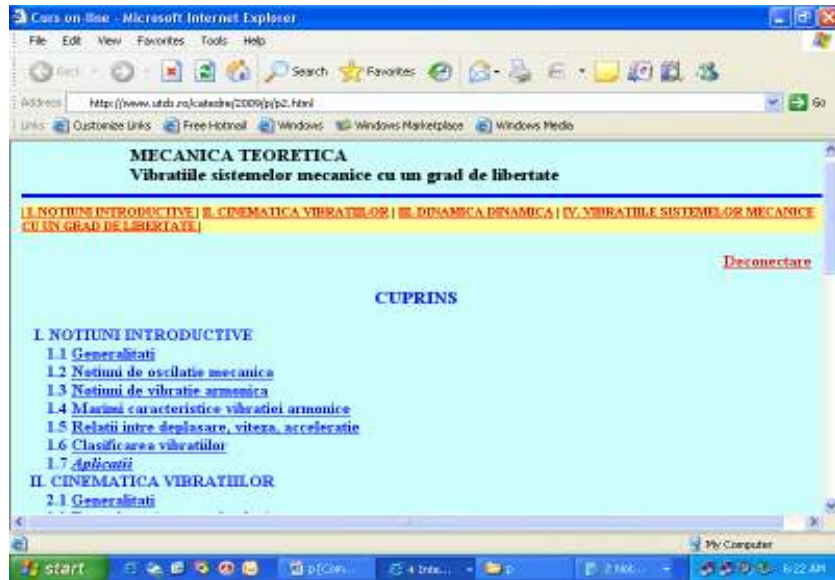


Figure 4: Division the chapters of the course



Figure 5: Presentation on-line course in HTML format

4. CONCLUSIONS

e-Learning presents the following advantages: reduced costs for training; disappearing geographical barriers, distribution fast of materials required, a single material is used by more people the flexibility to modify or change the content, circulation fast of information and its use in developing new projects, use of animations for the understanding of complex processes and phenomena; using accounts and passwords for the security of certain information.

REFERENCES

- [1] Microsoft® Security Guidance Training for Developers II, Microsoft, U.S.A., 2002;
- [2] Carmen Holotescu - *Tehnologii Internet (curs)* (UPT, 2003);

- [3] Michael Morrison - *HTML & XML for Beginners*, Microsoft Press, Redmond, Washington, 2001;
- [4] *Introduction to Programming*, Microsoft, U.S.A., 2004;
- [5] Florin Bausic, Cristian Pavel, Cristian Diaconu – *Mecanica Teoretica*, Editura MATRIX ROM, Bucuresti, 2007;
- [6] Janine Warner, Paul Vachier – *Dreamweaver 4*, Editura Tehnica, Bucuresti, 2003;
- [7] Marquis, A., Courter, G. - *Ghidul dumneavoastra pentru Microsoft Office Professional pentru Windows 2000*, Editura All Educational, Bucuresti, 1999;
- [8] Simona Marilena ILIE - “*MEDII VIRTUALE DE ÎNVĂȚARE*” - A XII-A SESIUNE DE COMUNICĂRI ȘTIINȚIFICE A CADRELOR DIDACTICE DIN UNIVERSITATEA ROMÂNNO-AMERICANĂ CU PARTICIPARE INTERNAȚIONALĂ: ‘CREȘTEREA COMPETITIVITĂȚII ECONOMICE A ROMÂNIEI ÎN CONTEXTUL INTEGRĂRII ÎN UNIUNEA EUROPEANĂ’, organizată de UNIVERSITATEA ROMÂNNO-AMERICANĂ, București, 25-26 Mai 2007, pag. 129-138;
- [9] <http://www.comsys.ro>;
- [10] <http://www.icvl.ro>;
- [11] www.softnews.ro;
- [12] www.softrom.ro;
- [13] <http://www.unap.ro>;
- [14] <http://www.cursurionline.ro>;
- [15] <http://www.academiaonline.ro>.