

**Declaration by the Beneficiary**

**Financial agreement number:**

**2979- IC - 4 - 1999 - 1- PT - ERASMUS-EPS**  
**~~10063- CP - 1 - (99)2000 - 1 -PT- ERASMUS-ETNE~~**

"I, the undersigned, certify that all the information and financial data contained in this Final Report is correct and has been approved by the persons responsible within each of the partner organisations involved in the activities referred to herein."

Signed in: Lisbon, Portugal

on 16 / 10 / 2001

*Signature of the Beneficiary's legal representative*

Seal/stamp of the organisation

*Name and function in capital letters*

PROF. DR. JOSÉ LOPES DA SILVA  
RECTOR OF UNIVERSIDADE TÉCNICA DE LISBOA



## Part 1: Confirmation of project data

### Project Partnership

- The consortium responsible for this project is composed by:

- 47 European universities (E-18)
- 19 universities belonging to the PECOS countries
- University of Mariupol - Ukraine,
- Bogazici University, Istanbul - Turkey,
- University of Tangiers, Morocco.
- 1 European association EAEEIE
- an enterprise Giunti Interactive Labs S.r.l from Genoa, Italy

**An approved list of the full project partnership for the first year is presented in *Annex A.1*.**

The dissemination of project results and objectives in international conferences, workshops etc increased the number of institutions that applied to join our Thematic Network THEIERE.

**The total number of partners for the second year now amounts to 53 E-18 and 23 PECOS higher education institutions.**

During the eligible period the President of EAEEIE (European Association for Education in Electrical and Information Engineering) has changed. EAEEIE is now represented by Prof. Pentti Lappalainen, the new president of EAEEIE. The representative of the University of Hertfordshire (UK) also changed; the representative is now Prof. John Stobo.

For further information concerning the project partners please refer to *Annex A.1*.

---

If applicable, please give the project's website address below, along with any login names and passwords required to access its internal sections.

<b>Website address</b>	<b><a href="http://www.eaeeie.org/theiere">http://www.eaeeie.org/theiere</a></b>
Login name (if applicable)	
Login password (if applicable)	

## Part 2: Description of project activities

### 2.1 Summary of activities undertaken (maximum 2 pages)

#### start and end dates

- September 2000 to end of September 2001

#### type of activity

##### **General activity**

- Two plenary meetings: Co-ordinating team and Lead site co-ordinators meetings, virtual meetings
  - Maintenance of the THEIERE web site installed on a new server: <http://www.eaeie.org/theiere> and installation of a list server dedicated to the Thematic Network activities.
  - A server dedicated to the Web-based courses/modules. This server is available free of charge and is distributed, in the sense that each partner is responsible for its own course or module. All the pedagogical resources available can be reached from the central web-server located in Nancy. <http://www.eaeie.org/theiere>
- Dissemination of our work via some International and national conferences.
- Participation of some THEIERE TN partners to the 12<sup>th</sup> Annual EAEEIE Conference, EAEEIE01Nancy (Innovations for Education in Electrical and Information Engineering), hosted by Université Henri Poincaré Nancy 1, France.

The partners' activity in THEIERE TN, for the first year was divided into two tasks:

**TASK 1** A survey and analysis of EIE education at a European level, concerning organisation, pedagogical issues, new pedagogical tools, and main trends in education systems in EIE.

**TASK 2:** Development of course modules available through the Internet, which are available at the THEIERE web -site, for the general public. These modules continue the work performed in our previous thematic network INEIT-MUCON, and represent a continuous effort to build a European virtual university in EIE, with a consensual syllabus that comes from the contribution of the representatives of the participating institutions in this network

- **TASK 1 activities:**

Due to the complexity of educational structures in Europe This TASK 1 was subdivided into work packages **WP's** concerning the level of studies.

*WP1 bachelor studies (Valence (France)+Bratislava(Slovakia) are co-ordinators)*

*WP2 master studies (Nancy (France)+Wroclaw (Poland) are co-ordinators)*

*WP 3 doctoral studies (Limerick (Ireland)+EUDIL (France)+Prague (Czech Rep) are co-ordinators)*

- Building a questionnaire for each of the three levels of study contemplated in the 3-5-8 Model, to allow an efficient survey of European Curricula.
- Summarising the results obtained in graphical form to facilitate the apprehension of the educational structures in Europe.
- In *Appendix A.2* a graphical form of the survey is included, as well as the questionnaires
- A database on Control and robotics degree was launched and some data from 4 countries is already available. This database will be extended and completed along the second year of the project.

- **TASK 2 activities:**

Development of common tools, usable by all INEIT-MUCON Partners and eventually by other Thematic Networks.

This activity was co-ordinated by the **Universidad Politecnica de Valencia** and the **Universidad de Vigo**, both from Spain.

- Production of some THEIERE TN packages <http://www.eaeie.org/theiere>
- A division into specialities was performed in order to achieve the maximum consensus, and efficiency. The activities inside each speciality were co-ordinated by the so-called LEAD SITE Leaders, two for each speciality. The groups considered are:
  - Computers, Telecommunications, Electronics, Power Systems and EMC,
  - Fundamental Concepts, Instrumentation and Sensors, Internet Services and Applications, Virtual labs.

- Besides these another group was suggested by the University of York, dealing with non-technical skills (Behavioural Skills) that are essential for the future performance of engineers. These skills include Report writing, Public speaking, Project management, Time management, Information searching and management, Problem solving, Working creatively, Working in teams and Managing meetings.
- Implementation of a number of short demonstration modules, available at the Theiere website. Some of the modules are available in the mother tongue, others in English to facilitate the peer review and assessment. As an example we have printed some of the available Internet-based courses. They are included in **Annex A.3**.

### Aims

What we plan to achieve inside this thematic network is a reflection on how to adapt our curricula in Electrical and Information Engineering in order to facilitate the adaptation of our present curricula to the 3-5-8 format recommended by the European countries ministers for education. To meet this challenge we will:

- Make an overview of the curricula available in EIE in Europe.
- make an overview of the ECTS available, which can be helpful in our quest ,
- A reflection on the best practices of high engineering education in the specific field of electrical and information engineering in a European perspective.
- Design and production of Web-based modules disseminated through the Internet, which are available free for students and academic staff and the general public.

### location(s) of meetings

- Physical meetings in connection with EAEEIE events
  - ◆ THEIERE Thematic Network general meeting in Rennes- France (February 10<sup>th</sup> 2001)
  - ◆ THEIERE Thematic Network general meeting in Nancy-France, May 2001 together with the 12th EAEEIE Conference.
- Co-ordinating team meetings in: Lisbon (January 2001), Sesimbra (August 2001), Portugal
- Virtual meetings via Internet (use of list server and e-mail)

### expected benefits

- The work developed in Task 1 will be a useful tool to adapt our curricula to the 3-5-8 format recommended by the European countries ministers for education. Survey will help to understand the differences and can provide guidelines to achieve a harmonisation of curricula in EIE.
- Course materials reachable via Internet in 8 main topics.
- Improvement of teaching in EIE in Europe with the help of a common curriculum
- Improvement of co-operation between Higher Education institutions

### outcomes and results

- A database on Control and robotics degree is available and will be extended in the second year
- Survey on existing educational structures in Europe (<http://www.eaeeie.org/theiere>)
- THEIERE TN packages. **(Please refer to Part 3, Sections A, B and C)**
- Database about Information Technology Tools for Education in the field of Electrical and Information Engineering (more than 100 references). **(Please refer to Part 3, Sections A, B, C)**
- Common tools for WWW curriculum development

### partner(s) responsible(s)

- 3 circles
  - Co-ordinator
  - Lead Sites and
  - Partners of THEIERE TN

### Other organisations/contacts involved

Club EEA (France)- Contact Person: Prof. Olivier Bonnaud  
 SINTEF (Norway)- Research Organisation  
 Norwegian Chartered Engineers. Association  
 BITRIND- IF TECH Network- information providers  
 Ordem dos Engenheiros (Portugal)  
 Careerspace

## 2.2 Description of activities

---

### Aims and objectives for the first year

According to our initial proposal, the **first** year of THEIERE Thematic Network was devoted to:

- Survey on the kinds of curricula available in Electrical and Information Engineering throughout Europe. (*See annex A-2, for results of survey and questionnaires*)
- Installation of a database, with information on educational structures and institutions in Europe (work in progress).
- Installation of central server (<http://www.eaeie.org/theiere>) and Lead-site servers to assure efficient communication inside the network.
- Installation of a list-server ([theiere@eaeie.org](mailto:theiere@eaeie.org)), to exchange information between the project partners.
- Definition of a common template, navigation and interactivity requisites, which is available at the Theiere website and can be used by all the partners to implement the Internet courses with a common format.

The objectives have been achieved, despite the time limitations due to the late approval of the project. Peer review has been used to monitor the progress of the different activities. This continuing monitoring reflected in a positive manner in the overall development of the project enabling us to meet the objectives.

### Organisational approach and structure

- We have used the same management system as in our previous Thematic Network INEIT MUCON: Co-ordinator and the so-called Lead Sites  
The overall project management is guaranteed by the Co-ordinator, assisted by the TN Lead Sites Committee.
- Each lead site is formed by one or two co-ordinators, which are responsible by monitoring the work, performed in his/hers domain and partners who are in charge of developing and testing the work attributed to the group during the first general meeting.
- All the lead sites co-ordinators report directly to the General co-ordinator, who is responsible for the overall project development and management.

- **Internal communication**

The same decentralised structure was used for the exchange of information. Web sites are the **cornerstones** of our internal information exchange system; completed by the heavy use of electronic mail and electronic transfer of information:

Due to the size of the network a decentralised structure with specific tasks attributed to each lead site, with fast feedback provided by fast transfer of information between the partners, proved to be very useful. The project development in each working group is under the responsibility of each Lead Site with the help of the associated partners, under the control of all partners through internal dissemination procedures:

This structure proved to be well adapted to our activities and allowed an efficient development and management of our activities.

### Educational and teaching approaches

The curricula developed are based on the following approaches:

- **Theoretical courses** as hyper-text which are used with several levels and approaches, the practical means consists in developing these theoretical courses using Internet and the new tools which give the ability for a student to "navigate" in a course as a function of its own level and difficulties. The lectures include several links to other web sites, used to illustrate the Virtual **Library** and invite
- **interactive simulations** using Java-tools for instance
- **demonstrations** and **illustrations** within the courses, using multimedia tools,
  - **interactive exercises** with questions and feedback hints that guide the student to find the correct answer.
  - Built-in **self-evaluation** for the students,
  - **laboratory** works that are proposed either as:
    - **Distant labs** (remote access to existing laboratories)
    - Tele-labs (simulation of real laboratory experiments)

### Tools and technology:

The use of new technologies is the core of our project. Within the project:

- development of teaching material using new technologies, (TASK2)
- Development of a web site including some tools such as fora, newsgroup, mailing list, chat rooms for co-operative work.

The new technologies are also extensively used in the Internet-based courses, by means of:

- Organisation of curricula around this scheme, using new technologies
- Main course with several levels (HTML and PDF pages, dynamic slides)
- Interactive exercises with several corrections levels
- Simulations to help in understanding some theoretical concepts
- Distant access to some practical labs

### Evaluation

- Due to time limitations that arose from the late approval of TNs, and the fact that it is the project's first year, we are trying to integrate the partners' different contributions and approaches. Therefore, the process of evaluation is still internal to the network of partners.
- Demonstration of draft packages has been made during the TN meetings, which allowed for peer review and criticism.
- **Using course material in curricula of partners' universities, probably during 2002 will do validation by EAEEIE and a first stage of evaluation.**
  - Integration by partners of THEIERE TN packages in their own curricula during the project's duration
  - Looking for other institutions, who are not TN members to get a more objective point of view, especially in the field of Continuing Education.
  - Establishment of a methodology of evaluation and validation ; including namely:
    - Definition of a protocol for using TN packages in academic curricula in order to formalise the way of getting "feed backs" from both academic staff and students
    - Writing of a questionnaire devoted to academic staff, in order to have common criteria for analysing the contributions and lacks of TN packages in teaching process,
    - Writing of a questionnaire devoted to the students, in order to get real feedback from final users These questionnaires will obviously be distributed and collected through Internet.
    - The definition of a set of **accreditation criteria** will be done at a later stage and represents a very important step for course acceptance and the use of distributed curricula. At this stage that definition seemed premature.

### Dissemination:

Dissemination of projects results and outcomes was done in several ways (*see also annexes A-4 and A-5 on the statistics of the use of the web-site of THEIERE and also some information on the dissemination of the former INEIT-MUCON Thematic Network*).

- Web site presenting our activities and the library of pedagogical resources reachable through Internet: <http://www.eaeeie.org/theiere>
- Peer review in International Conferences, meetings and workshops. Some of these conferences had a strong participation from the members of THEIERE TN.  
*A list of publications is presented in pages 16-18 and also in Part 3-A.* Nevertheless we can emphasise the following:
  - **12th EAEEIE Conference Nancy 2001**, May 14 - 16, 2001, Nancy, France, "Innovations for Education in Electrical and Information Engineering", **31 papers** connected with the activities achieved within or around the thematic network have been presented during the conference (<http://www.eaeeie.org/theiere/conferences.html>) and some specific sessions, connected with THEIERE activities, have been organised during the conference:
    - ◆ Legal aspects on copyrights, Chair and organisation: M. Diprose (UK)
    - ◆ Harmonisation of curricula on a European level, Chair and organisation : M. J. Martins (PT)
    - ◆ Technology transfer in remote areas, Chair and organisation : A. García (ES)

- ◆ **Jahrestagung der Deutschen Gesellschaft für Akustik DAGA Oldenburg 2000**
- **4th IFAC International Symposium on Intelligent Components and Instruments for Control Applications**, Buenos Aires, Argentina, 2000.
- **ITHET2001**, 04-06 July 2001, Kumamoto (Japan).  
6 papers connected with the activities achieved within or around the thematic network have been presented during the conference
- **Simposio Internacional de Informática Educativa (2º Puertollano, Ciudad Real, 2000). Informática y educación para una sociedad interconectada**
- **IEEE Interdisciplinary Conference on Electrical, Electronics and Computer Engineering Education**
- **4th UICEE Annual Conference on Engineering Education**, Bangkok, Thailand, 7-10 February 2001
- **PHYTEB 2000**, Barcelona, Spain, 27 Aug.- 1st Sept. 2000
- The strong partnership with EAEEIE (<http://www.eaeeie.org>) is a useful channel for dissemination. A partnership has also been initiated with some national associations: in 2001, particularly, the 12<sup>th</sup> EAEEIE conference, which was sponsored by the THEIERE thematic network, was organised in a partly joint event with the 41<sup>st</sup> French Club EEA congress in Nancy. This was the opportunity to present and disseminate the THEIERE (and former INEIT-MUCON) thematic network to 100 European participants and more than 170 French participants. The French Club EEA regroups 1000 members, teachers in Electronics, Power System and Automatic Control and is a good way to send some information at a French national level. As a complement, we may say some works are achieved by a working group within the Club EEA in order to make a census on ECTS and multi-national diploma available in France. Some members are also members of THEIERE which means that the co-operation between the thematic network, the European association and a national association are useful and fruitful for present and future works (*see also Annex A-6*).

### Open and distance learning

The contribution to building a European Virtual University in EIE, which is one of the aims of this project, seems to be well adapted for Open and Distance Learning. The modules or products developed in THEIERE TN will be put at the disposal of ODL institutions.

The contribution of these institutions, as external evaluators as well as during the validation and accreditation phases will be very useful.

### Qualitative description of the project results and products,

Contact person for information about the global project:

Co-ordination:	Prof. Maria J. Martins Instituto Superior Tecnico Avenida Rovisco Pais 1 1049-001 Lisboa Portugal Tel : +351 21 8419203 Fax: +352 21 846 4455 E-mail: pcjoaom@alfa.ist.utl.pt
----------------	--

The outcomes of the project consist can be summarised as:

- **THEIERE Thematic Network survey on EIE Education**  
(URL: <http://www.eaeeie.org/theiere/outcomes.html> (available freely).
- **THEIERE database of courses in Instrumentation and Control**
  - search engine of courses according to:
    - country, university, type of course, lectors and key words
- **THEIERE Thematic Network modules**,  
(URL: <http://www.eaeeie.org/theiere/outcomes.html> (available freely).

## Common framework for structuring didactic materials

*Contact person:* Félix Buendía-García

Institution: E.U. Informática. Universidad Politécnica de Valencia

Address: Camino de Vera s/n

Post code: 46022 Town: Valencia Country: Spain

Tel.: + 34 963877575 Fax: + 963877579 E-mail: fbuendia @disca.upv.es

THEIERE TN Database of Courses in Instrumentation and Control*Contact person :* Jan Ligus

Institution: Technical University of Kosice

Address: Letna 9

Post code: 040 01 Town: Kosice Country: Slovakia

Tel.: + 421 95 6022575 Fax: + 421 956022575 E-mail: ligus@tuke.sk

THEIERE TN Teaching Module on Measurement and Control*Contact person:* Jan Ligus

Institution: Technical University of Kosice

Address: Letna 9

Post code: 040 01 Town: Kosice Country: Slovakia

Tel.: + 421 95 6022575 Fax: + 421 956022575 E-mail: ligus@tuke.sk

THEIERE TN The Virtual Laboratory – part 2 – the digital multimeter*Contact person:* M.F.Diprose

Institution: University of Sheffield, Department of Electronic and Electrical Engineering,

Address: Mappin Street,

Post code: S32 3XB. Town: Sheffield. Country: U.K.

Tel : +0044 114 222 5356 Fax: +0044 114 272 6391

E-mail: m.f.diprose@ sheffield.ac.uk

THEIERE TN Teaching Module on Control & Instrumentation Telelaboratory  
“Control and monitoring of the campus heating system”*Contact person:* W. Grega

Institution: Department of Control, University of Mining and Metallurgy

Address: Mickiewicza Av

Post code: 30-059 Town: Krakow Country: Poland

Tel : +48126172096 Fax: + E-mail: wgr @ia.agh.edu.pl

THEIERE TN Instrumentation Amplifiers			
<i>Contact person :</i>		George Georgiev	
Institution:	Rousse Univ.		
Address:	8, Studentska street		
Post code:	701	Town: Rousse	Country: Bulgaria
Tel.:	+ 35 9 8244507 256	E-mail: gsg @ru.acad.bg	Fax: +

THEIERE TN Teaching Module on Microsensors for Process Industry			
<i>Contact person :</i>		Saba Mylvaganam	
Institution:	Telemark University College		
Address:	Kjoelnesringt 56		
Post code:	N-3914	Town: Porsgrunn	Country: Norway
Tel.:	+ 47 35575151	Fax: + 47 35575250	E-mail: sabam@pors.hit.no

A Computer Aided Learning Package for Tolerance Analysis			
<i>Contact person :</i>		A. E. Ward	
Institution:	University of York		
Address:	Department of Electronics		
Post code:	YO10 5DD	Town: York	Country: England
Tel.:	+ 44 1904 433021	Fax: + 44 1904 432335	E-mail: aew@ohm.york.ac.uk

THEIERE TN Outil Pédagogique d'initiation à la microélectronique			
<i>Contact person :</i>		Olivier BONNAUD	
Institution:	Université de Rennes 1		
Address:	Campus de Beaulieu		
Post code:	35042	Town: Rennes cedex	Country: France
Tel.:	+ 33 (0)2 99 28 60 71	Fax: + 33 (0)2 99 28 16 74	E-mail: olivier.bonnaud @univ-rennes1.fr

Behavioural (non-technical) Skills Report			
<i>Contact person :</i>		A. E. Ward	
Institution:	University of York		
Address:	Department of Electronics		
Post code:	YO10 5DD	Town: York	Country: England
Tel.:	+ 44 1904 433021	Fax: + 44 1904 432335	E-mail: aew@ohm.york.ac.uk

Behavioural (non-technical) Skills Web resource			
<i>Contact person:</i>		A. E. Ward	

Institution:	University of York		
Address:	Department of Electronics		
Post code:	YO10 5DD	Town: York	Country: England
Tel.:	+ 44 1904 433021	Fax: + 44 1904 432335	E-mail: aew@ohm.york.ac.uk

THEIERE TN Teaching Module on :THE CONTRIBUTION TO THE DEEPER UNDERSTANDING OF THE FIELD OPERATORS IN THE ELECTROMAGNETIC FIELD THEORY

<i>Contact person :</i>	Assoc. Prof. Jozef Jasenek		
Institution:	Slovak University of Technology, Faculty of Electrical Engineering and Information Technology		
Address:	Ilkovicova St. No. 3		
Post code:	812 19	Town: Bratislava	Country: Slovakia
Tel.:	+421 2 60291737	Fax: +421 2 65420415	E-mail: jasenek@elf.stuba.sk

THEIERE TN Teaching Module on Educational Media

<i>Contact person :</i>	Fanny Klett		
Institution:	Ilmenau Technical University		
Address:	P.O. Box 10 05 65		
Post code:	98684	Town: Ilmenau	Country: Germany
Tel.:	+49/3677/69 26 71	Fax: +49/3677/69 12 55	E-mail: Fanny.Klett @ RZ.TU-Ilmenau.DE

THEIERE TN Teaching Module on Pulse Modulation

Contact Person:	.Prof.Dr. Dimiter Tz. Dimitrov		
Institution:	Technical University of Sofia,Bulgaria		
Address:	Student town-Sofia, P.O.Box 27, 1799 Sofia, Bulgaria		
Post code:	Post code: 1799	Town: Sofia	Country: Bulgaria
Tel.:	+ 359 (2) 9652278	Fax: + 359(2)758786	E-mail: dcd @vmei.acad.bg 812 19Town:

GDE – Tool Supporting Application Development for Message-Passing Environments

Name:	Jan Kwiatkowski		
Institution:	Wroclaw University of Technology, Computer Science Department		
Address:	50-370 Wroclaw, Wybrzeze Wyspianskiego 27, Poland		
Post code:	50-370	Town: Wroclaw	Country: Poland
Tel :	+48 713203602	Fax: + 48 713211018	E-mail: kwiatkowski @ ci-1.ci.pwr.wroc.pl

## THEIERE TN Teaching Module on Parallel Matrix Multiplication Algorithm – Multimedia presentation on Internet

Name: Jan Kwiatkowski  
 Institution: Wroclaw University of Technology, Computer Science Department  
 Address: 50-370 Wroclaw, Wybrzeze Wyspianskiego 27, Poland  
 Post code: 50-370 Town: Wroclaw Country: Poland  
 Tel : +48 713203602 Fax: + 48 713211018 E-mail: kwiatkowski @ ci-1.ci.pwr.wroc.pl

## THEIERE TN Teaching Module on Sensors

Name: Michel Robert and Jean-Marc Thiriet ([http://www.eaeie.org/theiere\\_sensor/](http://www.eaeie.org/theiere_sensor/))  
 Institution: Université Henri Poincaré Nancy 1  
 Address: CRAN, 2, rue Jean Lamour  
 Post code: 54500 Town: Vandœuvre Country: France  
 Tel : +33 3 83 50 33 14 Fax: + 33 3 83 54 21 73 E-mail: michel.robert@esstin.uhp-nancy.fr

## THEIERE TN Teaching Module on Signal Processing

Name: Jean-Marc Thiriet ([http://www.eaeie.org/theiere\\_signal/](http://www.eaeie.org/theiere_signal/))  
 Institution: Université Henri Poincaré Nancy 1  
 Address: CRAN, 2, rue Jean Lamour  
 Post code: 54500 Town: Vandœuvre Country: France  
 Tel : +33 3 83 50 33 14 Fax: + 33 3 83 54 21 73 E-mail: jean-marc.thiriet@esstin.uhp-nancy.fr

## THEIERE TN RF Transmission Line Simulator

Contact person: Maria Joao Martins  
 Institution: Instituto Superior Tecnico  
 Address: Av. Rovisco Pais 1  
 Post code: 1049-001 Town: Lisbon Country: Portugal  
 Tel : +351 21 8419203 Fax: + 351 21 846 4455 E-mail: pcjoaom@alfa.ist.utl.pt

## THEIERE TN Development of a E-Learning Platform

Contact person: Joaquim Filipe  
 Institution: Escola Superior de Tecnologia  
 Address: Campus de Estefanilha,  
 Post code: 1049-001 Town: Setubal Country: Portugal  
 Tel : +351 21 65790 000 Fax: + 351 21 657 21 869 E-mail: jfilipe@bocage.ips.pt

## LIST OF PUBLICATIONS

(2000-2001)

- BENLLOCH, J.V.; BUENDÍA, F.; AGUSTÍ, M.; GIL, J. A. & RODAS, A.: Developing Web-based Courses on Computing Using a Hypermedia Model [CD-ROM].- In MONTGOMERIE, Craig & VITELI, Jarmo (Eds.): Proceedings of ED-MEDIA 2001 World Conference on Educational Multimedia, Hypermedia & Telecommunications (Tampere, 2001).- Norfolk, VA, (USA): Association for the Advancement of Computing in Education, 2001, pp 129-130.
- BURGUILLO, J.C.; BENLLOCH, J.V.; SANTOS, J.M.; RODRÍGUEZ, D.A. & BUENDÍA, F.: X-Quest: An Open Tool to Support Evaluation in Distance Learning [CD-ROM].- In MONTGOMERIE, Craig & VITELI, Jarmo (Eds.): Proceedings of ED-MEDIA 2001 World Conference on Educational Multimedia, Hypermedia & Telecommunications (Tampere, 2001).- Norfolk, VA (USA): Association for the Advancement of Computing in Education, 2001, pp 220-221.
- BUENDÍA, F.; DIAZ, P.; SAHUQUILLO, J.; BENLLOCH, J.V.; GIL, J. A. & AGUSTÍ, M: XEDU, a Framework for Developing XML-based Didactic Resources.- In Proceedings of Euromicro 2001Conference. Workshop on Multimedia and Telecommunication (27th, Warsaw (Poland), 2001). 2001: A Net Odyssey.- Los Alamitos, California: IEEE Computer Society, 2001, pp 427-434.
- BENLLOCH, J.V.; BUENDÍA, F.; LEMUS, L.; AGUSTÍ, M.; & RODAS, A.: Los simuladores como núcleo de los recursos didácticos multimedia accesibles desde Internet [CD-ROM].- En Jornadas de Innovación Educativa. Metodologías activas y evaluación (I, Valencia, 2001).- Valencia: Instituto de Ciencias de la Educación, Universidad Politécnica de Valencia, 2001.
- BUENDÍA, F.; BENLLOCH, J.V.; GÓMEZ, J.M.; BURGUILLO, J.C. y RODRIGUEZ, D.: Herramientas para la gestión de recursos didácticos accesibles desde Internet, en un contexto europeo.-En Simposio Internacional de Informática Educativa (3er, Viseu (Portugal), 2001). (accepted to be published).
- Le réseau thématique THEIERE : nouvelles technologies et harmonisation des cursus pour l'université de demain - THIRIET, J.M.; MARTINS M.J.; ROBERT M. - Colloque CETSIS-EEA, Clermont-Ferrand, France, 29-30 octobre 2001 (accepted to be published).
- Remote Data Acquisition over Internet - LEMUS, L.G.; BENLLOCH, J.V.; BUENDÍA, F.; GARCÍA, J.M. y BAYO, J.L.: - En ESTEVE DOMINGO, M. ; GUERRI CEBOLLADA, J.C. and PALAU SALVADOR, C. (Eds.): *Annual Scientific Conference on Web Technology, New Media, Communications and Telematics Theory, Methods, Tools and Applications. (6th, Valencia, 2001)*.-Delft (The Netherlands): SCS Europe Publication, 2001.- pp. 39-42.
- Desarrollo de recursos didácticos multimedia, accesibles desde Internet, en un contexto europeo - BENLLOCH, J.V.; BUENDÍA F.; GÓMEZ J.M.; LEMUS, L.; AGUSTÍ, M. y RODAS, A.: - International Workshop on Multimedia Applications (1st, Valencia, 2001) (proceedings in print).
- Design of 3D Anatomical Models for Medical and Multidisciplinary Educational Activities - F. Klett, D. Dimitrov, S. Hoene - World Conference on Telemedicine Toulouse 2000, Proceedings pp. 84-85.
- Multiple Darstellung der akustischen Wahrnehmung in der universitären Akustik-Lehre - F. Klett, S. Hoene, D. Mayer-Ullmann - 26. Jahrestagung der Deutschen Gesellschaft für Akustik DAGA Oldenburg 2000, Tagungsband pp. 734-735.
- Hypermedia and the Communication Aims in Engineering Learning Environments - F. Klett - IEEE Interdisciplinary Conference on Electrical, Electronics and Computer Engineering Education Davos 2000. (proceedings in print).
- Simulation und Interaktion in Real-Time-3D-Lernumgebung für akustische Lehrinhalte - F. Klett - 27. Jahrestagung der Deutschen Gesellschaft für Akustik DAGA Hamburg 2001.
- A framework for Design and Interaction in 3D Real-time Learning Environments - F. Klett - IEEE International Conference on Advanced Learning Technologies Madison/Wisconsin 2001. (proceedings in print).
- A novel approach for teaching electrodynamics - M. HOFFMANN - ISTET 2001, Linz (Austria), 19th-22nd August 2001.
- Enterprise training and development in an electronics undergraduate programme - A. WARD - 4th UICEE Annual Conference on Engineering Education, Bangkok, Thailand, 7-10 February 2001.
- A transform method to teach Maxwell-Theory - M. HOFFMANN - 4th UICEE Annual Conference on Engineering Education, Bangkok, Thailand, 7-10 February 2001.
- A computer aided learning package for tolerance analysis - T. WARD & K. SHAWWA - ITHET2001, 04-06 July 2001, Kumamoto (Japan).
- A novel approach to higher education in Electrical, electronics and Information Engineering - M. HOFFMANN, ITHET2001, 04-06 July 2001, Kumamoto (Japan).

- Visualization of Assembly - Code conversion into machine code - P. LAPPALAINEN - ITHET2001, 04-06 July 2001, Kumamoto (Japan).
- Why a Virtual Campus in technical and technological teaching? - O. BONNAUD, Y. DANTO - ITHET2001, 04-06 July 2001, Kumamoto (Japan).
- Microelectronics Technology Course for a Virtual Campus - O. BONNAUD - ITHET2001, 04-06 July 2001, Kumamoto (Japan).
- Interactive Microelectronics Technology Course Available on Website - O. BONNAUD, P. MÜNSTER, H. LHERMITE, C. DIACONESCU - MSE01, Poster, Las Vegas – NV (USA) June 2001, Proc. IEEE Int. Conf. on Microelectronic Systems Education.
- 12th EAEEIE Conference Nancy 2001, May 14 - 16, 2001, Nancy, France, "Innovations for Education in Electrical and Information Engineering",
  - M.J. MARTINS, M. ROBERT, J.M. THIRIET - THEIERE: a thematic network focused on harmonisation of curricula - pp. 1-5.
  - B. de FORNEL, J.M. THIRIET, O. BONNAUD - The French Club EEA Commission for International relationships - pp.7-10.
  - A.J. GARCÍA - Information technology and higher education: a critical review - pp. 11-16.
  - M.J. MARTINS, J. ESTEVES, J. PALMA, M. PEREIRA - Profile characterisation of final year graduate students in EIE - a fundamental tool for qualify certification - pp. 33-36.
  - M. MILOSZ, A.WAC WLODARCZYK - Applied informatic, a new degree course elaborated by two co-operating universities - pp. 37-40.
  - M. MILOSZ - E commerce: the new post-graduate studies at Lublin Technical University - pp. 59-60.
  - L. TRYBUS, M. WYSOCKI - Control systems teaching focusing on practical design - pp. 91-96.
  - M. DIPROSE - Publishing teaching software - an Academic author's perspective - pp. 97-101.
  - J.C. BURGUILLO, J.M. SANTOS, D.A. RODRÍGUEZ, F. BUENDÍA, J.V. BENLLOCH, J. RODRÍGUEZ - A questionnaire-authoring tool to support computer based training through distance evaluation - pp. 115-120.
  - M.H.W. HOFFMANN - An evaluation concerning customers' acceptance of internet-based teaching material - pp. 137-142.
  - M.H.W. HOFFMANN - A novel approach to higher education in electrical, electronics and information engineering - pp. 159-163.
  - M. GUERRA, A. SUAREZ - Learning tools for diode-based circuits for microwave and RF applications - pp. 165-168.
  - Y. DANTO, O. BONNAUD, H. YAHOU, B. de FORNEL - Towards a European harmonisation of electrical engineering background curricula - pp. 169-175.
  - M. PEREIRA, M.J. MARTINS, A.S.C. FERNANDES - Quality assessment of Internet based courses - pp. 177-181.
  - P. LAPPALAINEN - The structure of engineering education programs in Finland - pp. 183-187.
  - M.FM DIPROSE, T.A. HALL - Towards developing electronic examinations - pp. 211-215.
  - O. BONNAUD, P. MUNSTER, C. DIACONESCU - Microelectronics technology course on website: dissemination beginning of this INEIT-MUCON tool - pp. 255-260.
  - O. ZYNOVCHENKO, A. ZYNOVCHENKO - Teaching computer science using intellectual interactive learning computer system - pp. 261-266.
  - S. MYLVAGANAM, J. TIMMEMBERG - Usage of IT tools in the teaching of science mathematics and electrical engineering subjects, lessons from an EU project - pp. 285-290.
  - D.C. DIMITROV, V. KOSTADINOVA - Information system for telemedicine - pp. 343-347.
  - A. LUUKKO, K. KYLÄHEIKO - The regional role of Lappeenranta University of Technology in Eastern Finland - pp. 365-370.
  - P. DILLON, C. BURKLEY - Approaches to technology transfer in the Irish Shannon region - pp. 371-377.
  - B. CONRARD, M. BAYART - Process simulator: an economical solution for practical Electrical and Information Engineering teaching - pp. 437-442.
  - I. SLAIDINS, A. KAPENIEKS, G. LAUKS - Distance learning technologies in Riga Technical University - pp. 455-459.
  - M.F. DIPROSE - A model for implementing global e-learning: the student controlled summation of separate learning experiences to pass a registered examination - pp. 477-480.
  - P. GEND, E. GNAEDINGER - A sample reflection about functionalities and technical aspects of a distributed web design system applied to European curriculum development - pp. 481-484.
  - J. LIGUS, J. HORANSKA - The principle of direct communication in distributed control systems design - pp. 485-490.
  - F. BUENDÍA, J.V. BENLLOCH - XEDU, a XML-based framework for developing didactic resources - pp. 515-520.

- J. PALMA, J. ANTUNES, F. SIMOES, J. ESTEVES, and M.J. MARTINS - Hybrid process simulation: a powerful resource for industrial automation laboratory - pp. 551-555.
- M. CHIRICO, G. DONZELLINI, D. PONTA - Network based project learning for digital electronics - pp. 569-574.
- F. KLETT - Authoring for web-based educational activities - pp. 575-580.
- Interconnecting Courseware Modules Via WWW J.C. Burguillo, L. Anido, J.V. Benlloch, F. Buendía - "Computers and Education in the 21st Century" - Kluwer Academic Publishers ISBN 0-7923-6577-1, pp119-126, 2000.
- Desarrollo de recursos didácticos basados en la simulación para enseñanza no presencial. [CD-ROM] - BUENDÍA GARCÍA, F.; BENLLOCH DUALDE, J.V. y GÓMEZ SORIANO, J.M.: .- En ORTEGA, M. y BRAVO, J. (Eds.): *Simposio Internacional de Informática Educativa (2º Puertollano, Ciudad Real, 2000). Informática y educación para una sociedad interconectada.*- Asociación para el Desarrollo de la Informática Educativa (ADIE), 2000.
- 6èmes Journées pédagogiques du CNFM, JPCNFM'2000, Saint-Malo, France, 29 novembre-1er décembre 2000 - O. BONNAUD, S. VERMEULEN, P. MUNSTER, S. CAMPION, D. DANILOVIC - "Cours de technologie microélectronique interactif sur Internet : une nouvelle approche de la discipline".
- IV Congreso de Tecnologías Aplicadas a la Enseñanza de la Electrónica TAAE'2000, 13-15 Septiembre 2000, Barcelona, España - J. V. BENLLOCH, J. M. GÓMEZ, F. BUENDÍA "Recursos didácticos para la enseñanza de la instrumentación electrónica a través de la red", Vol II, pp 365-368, ISBN 84-600-9596-7.
- 4th IFAC International Symposium on Intelligent Components and Instruments for Control Applications, Buenos Aires , Argentina, 13-15 September 2000 - J.M. THIRIET, M. ROBERT, B. CONRARD - "Curricula reachable via Internet for teaching intelligent instruments" - pp. 189-194.
- GIREP 2000, Barcelona, España, 27 Aug., 1st Sept. 2000 - M. J. MARTINS, M. ROBERT, J.M. THIRIET - Linking teachers and students via WWW.
- Colloque international TICE 2000 (Technologies de l'Information et de la Communication dans les Enseignements d'Ingénieurs et dans l'Industrie), Troyes, France, 17-20 octobre 2000. - M. ROBERT, J. M. THIRIET, P. GEND - Vers un cursus européen en "Electrical and Information Engineering", le réseau thématique SOCRATES INEIT MUCON

## 2.3 Evaluation of the work undertaken (maximum 6 pages)

---

### Difficulties

Encountered difficulties or problems can be split into 3 categories:

- Management difficulties
- Technical difficulties
- Intrinsic difficulties

### Intrinsic difficulties

- The main one was lack of time due to the late approval of the Thematic Networks programme.
- In the case of **TASK 1-Survey of Engineering curricula in EIE**,
  - The lack of national statistics was a major obstacle that delayed considerably the work plan activities.
  - The manifold of educational structures that exist in the European space contributed to difficulting our task.

### Management

- The size of the network and the diversity of specialities and interests from the partners represented a difficulty for the efficient management of the network. We think however that the decentralised structure that we have used contributed in a great deal to achieve a satisfactory result to a certain degree.
- The hiring of students by the industry at an early stage of their education returns students from the university and therefore from the educational activities which are the core of this Network.
- Difficulties to stimulate partners who are not active within the network. Several contacts have been established but in some cases there was no response.
- A clear definition of copyright issues sometimes led to lack of co-operation from academic partners, even within our own institutions. This problem led us to form a group devoted to establishing a common copyright scheme that could be accepted by all the academic partners

### Technical

- Retrieval of information was sometimes difficult due to problems in browser accessibility and different operating systems.
- Difficulties to **directly** design THEIERE modules in **English language**
- Some tools, used for the development, are not so consistent. For instance Browsers and Java development tools evolve continuously, so, the different versions are not full compatible and from time to time the results, and especially graphical functionalities depend on the target computer. It's a minor problem because this kind of tools is generally available free of charge for academic institutions, and because we try to use as soon as possible the updated version.
- Difficulties to propose a homogenous form for the Internet-based courses/modules.  
Due to the late start of our activities the technical support group could only produce a final version of a general template by the middle of the eligible period. So, each development team has proposed an individual way for designing and develops a package or a sub-package using the tools and techniques they are familiar with. So the form of the modules is still remains inhomogeneous for the time being, but the creativity is necessary to produce attractive pedagogical resources. This will be resolved, thanks to the use of a common template defined by the Technical Support group during the second THEIERE meeting in Nancy, May 2001.

### Outcomes

The main outcomes are summarised in the table below. It is also indicated the target population for each outcome. Due to the reduction in the working period, caused by the late approval of the Network, the first meeting only took place on February 2001 instead of October 2000, as initially planned.

For further information on the **THEIERE outcomes** please refer to **Part 3-Sections A, B and C**

OUTCOMES	TARGETS
◆ a survey and analysis of EIE education at a European level, concerning organisation of studies in the main three levels (Bachelor, Master and Doctorate degrees)	Teachers, institutions
◆ Starting a database with information on courses in Electrical and Information Engineering in Europe. This database, can be used either by academic staff and students for mobility exchange programs	Teachers, students institutions,
◆ Teaching packages in the form of short courses available via internet or on CD-ROM. Pedagogical resources in EIE around "the minimum an engineer has to know"	Teachers, learners
◆ Building a site for each of the participating partners, with links to the TN packages already developed, links giving access to sites of professional engineering associations and networks. This site will also rely on communication tools such as a resource centre on internet, new-letters, internet forums or newsgroups...	TN partners,
◆ Communications in international or European conferences	Participants to those conferences (continuous dissemination action)

In **TASK 1 – Survey of Engineering curricula in EIE**, we have performed the development of questionnaires that were available at our website and accessed by all the partners. This methodology proved successful and allowed the lead site leaders to summarise the results in graphical form. This presentation enables a quick retrieval of information and will be useful in issuing recommendations for the transition to the 3-5-8-model application in Europe. Please refer to *Annex A1* to a full description of the results obtained.

**For further information please refer to Annex A-1.**

In **TASK 2 – Development of Pedagogical Internet-based Modules**, our work was based in the results already obtained in our previous Thematic Network-INEIT-MUCON.

Besides the groups contemplated already in INEIT-MUCON, we have added new technical areas, namely:

- The first one is the technical working group, who has defined a structure. A model structure was build that will serve as a framework to insert the courses. **SG1. Technical aspects:** The representatives from the *universities of Valencia and Vigo (Spain)* are co-ordinators
- The second group **SG2** will deal with **copyright aspects** and will work out didactical aspects. This group is co-ordinated by the *university of Sheffield, UK*
- The technical areas were divided into eight specialities, which are indicated in the table below.

Name of the package	Lead site
Computer and Information systems	<b>Univ. Oulu (Finland)</b>
Communication	<b>Uni. Of Ulm (Germany)</b>
Electronics	<b>Univ. Rennes 1 (France), Univ. of Cantabria (Spain)</b>
Power systems	<b>IST (Portugal) FEUP (Portugal)</b>
Instrumentation and control	<b>Telemark College (Norway)and Univ. Kosice (Slovakia) Univ. Rzeszow (Poland)</b>
<b>Internet services and applications</b>	<b>Univ. Ilmenau (Germany) Univ. Cagliari (Italy)</b>
Fundamental Concepts	<b>Technical Univ. Sofia (Bulgaria) and University of Sheffield (UK)</b>
<b>Virtual labs</b>	<b>Univ. of Rouse (Bulgaria)and KdG Antwerp (Belgium)</b>

- Besides these we have also included a non-technical area, entitled **“Behavioural skills”**, which covers a diversity of skills that are fundamental to the future professional performance of engineers. These skills include: Report writing, Public speaking, Project management, Time management, Information searching and management, Problem solving, Working creatively, Working in teams and Managing meetings (**For Further information refer to Annex A. -7).**

**Elements of good practice identified, by-products obtained and discoveries made.**

A side effect of the lack of homogeneity is the experience acquired and exchanged by the Lead Sites, on the use of Internet tools to produce and disseminate pedagogical resources. Several techniques and tools have been tested, and so we are able to evaluate to compare them and this experiment can also be shared with other Thematic Networks and used in the framework of other programmes.

The possibility offered by the Commission to use students and to remunerate them in order to help us in the production of THEIERE modules is very interesting.

The average duration of the remunerated work was 2 months and each student got 500 EURO.

(See below the corresponding table)

**TABLE OF STUDENTS GRANTS**

Institution	Responsible	Student name
Univ. Politec. Valencia	Felix Buendia/J. Bennloch (Tech. Support)	Empar Bisbal Asensi (embisas@inf.upv.es) Jose Manuel Gomez Soriano (jogoso@inf.upv.es) Manuel Lluesma Camps (mallcam@inf.upv.es)
Univ. Vigo	Juan Burguillo	Juan Manuel Santos Gago, Judith Rodríguez Estévez, Manuel Caeiro Rodríguez, Daniel A. Rodríguez Silva, Sebastián Olivares Suarez
Telemark University College	Saba Mylvaganam	Marius Wåge Urmila Datta
Krakow university of technology	Wojcieh Grega	1.Pawel Skruch 2.Piotr Targosz The job to be performed: "Development of English version of the www page: wg.ia.agh.edu.pl (industrial tele-laboratory)"
Tallinn Technical University	Raimund Ubar	1. Artur Jutman 2. Elmet Orasson The title of their work: Interactive laboratory course "Design and Test of Digital Systems"
Ilmenau	Fanny Klett	Matthias Sauer Sascha Rissmann
Cantabria	Almudena Suarez	Mario Guerra (double duties)
Wroclaw	Jan Kwiatkowski	Daniel Abrich and Tomasz Linda, Dariusz Konieczny An educational tool for designing programs under PVM environment.
Setubal	Joaquim Filipe	Roberto Silva Paulo Graça
Nancy	Michel Robert, Jean-Marc Thiriet	<ul style="list-style-type: none"> <li>Romuald HENRY, Christian HENRICH : Development of Java applets for signal processing</li> <li>Benoît CROISSANT : Updating and use of THEIERE templates for the " sensor " sub-package</li> <li>Rachid EL OUAHABI : Updating and use of THEIERE templates for the " digital signal processing " sub-package</li> </ul>
Bielsko -Biala	Januzs Jaruzsek	1. Marcin Czernek 2. Krzysztof Augustynek building links to the FEM packets Developing soft tools for distant lab. -
Univ. Malaga	Angel Garcia	Patricia Bernal Campos Beatriz Quintana Rodríguez
IST	Jorge Esteves	Alex Pereira, J. Broga Development of Course on Electrical Drives
IST	Prof. M.J. Martins	Luis Gonçalves, Francisco Veiga Development of Transmission Line course Development of Java applets for simulation
Bratislava	Jozef Jasenek	Marcel Mican, and Martin Mydla: "The deeper understanding of the field operators in electromagnetic field theory"
Sheffield	Mike Diprose & Clive Woods	N. Swinglehurst: m/media presentation for the web based explanation of basic principles of measurement
Rousse	G. Georgiev & S. Stefanova	Emil Penchev Penchev: "Configuration and installation of the

		Web server: Configuration of network adapters; Configuration and compilation of kernel Stanislav Yordanov Yordanov: "Construction of the "Virtual Labs" Web-site: Design of the HTML pages; Building of the HTML pages; Filling up the information" Emil Aleksandrov Stoyanov: "Curriculum on "Electrical Measurement" and information about the course Theoretical materials on the topic: "Instrumentation Amplifiers" in English and Bulgarian <a href="http://www.tie.ru.acad.bg/">http://www.tie.ru.acad.bg/</a>
Kosice	Jan Ligus	2 students working in the data base for Instrumentation and Control
Sofia	D. Dimitrov	Atanas Dimitrov Dimitrov and Georgi Angelov Shalafov: Pulse modulation

## Divergence

According to the initial work plan the objectives for this first year were:

**1<sup>st</sup> year:** Survey on the kinds of curricula available in Electrical and Information Engineering throughout Europe, with a particular focus on the multinational curricula or the curricula specially open or designed for exchanges of students (ECTS...). Installation of central and Lead-site servers to assure efficient communication inside the network. The proposed work plan as appeared in the first year application is included below.

In the table below, the "grey-coloured" boxes show the modifications, versus the original work-plan

	DATE	Activity	Partners involved	Outcomes
	Oct/Nov.2000	First Meeting-Methodology discussion and Task division	All	Definition of Lead sites co-ordination and working teams
<b>1<sup>st</sup></b>	Nov.2000/ Feb. 2001	Establishment of Central and Lead site servers and links to all the partners <b>1st meeting- Rennes, France, February 2001</b>	Co-ordinator + Lead sites co-ordinators	Web servers with software accessible by all partners
<b>Y E</b>	Feb./Jun 2001	<b>2<sup>nd</sup> Meeting-</b> Survey on EIE curricula development and perspectives in each country <b>May 2001-Nancy, France</b>	All	Report with survey on EIE Curricula in Europe
<b>A R</b>	Jun /August 2001	Development of open - learning modules, integrated in application	All	Internet modules available at TN web site

Due to the late approval of Thematic Networks, the **first meeting** planned for the **14th October in Nancy** was postponed and the **first meeting only took place in Rennes (France) in February 2001**. There was an overall delay of our activities, which caused some difficulties in the completion of our objectives.

- In **TASK 2** – Development of Pedagogical Internet-based Modules

We have added new technical areas, and two horizontal groups that will interact with all the partners, namely:

- The first one is the **Technical Support group, SG1**, who has defined a model structure. A model was build that will allow the insertion of the courses with a uniform appearance, navigation and interactive features. **Technical aspects:** The Lead sites are the *universities of Valencia and Vigo (Spain)*.
- The second group **SG2** will deal with **copyright aspects** and will work out didactical aspects. This group is co-ordinated by the *University of Sheffield, UK*.
- The technical areas were divided into eight specialities, which are indicated in the table below.
- The two packages indicated in **boldtype** are two new areas that were added due to their interest and future application.

**Distant labs/Telelabs**  
**Internet Services and Applications**

## Technical Areas

Name of the package	Lead site
Computer and Information systems	Univ. Oulu (Finland)
Communication	Uni. Of Ulm (Germany)
Electronics	Univ. Rennes 1 (France), Univ. of Cantabria (Spain)
Power systems	IST (Portugal) FEUP (Portugal)
Instrumentation and control	Telemark College (Norway)and Univ. Kosice (Slovakia) Univ Rzeszow (Poland)
<b>Internet services and applications</b>	Univ. Ilmenau (Germany) Univ. Cagliari (Italy)
Fundamental Concepts	<b>Technical Univ. Sofia (Bulgaria) and University of Sheffield (UK)</b>
<b>Virtual labs</b>	<b>Univ. of Rousse (Bulgaria)and KdG Antwerp (Belgium)</b>

- Besides these we have also included a non-technical area, entitled “**Behavioural skills**”, which covers a diversity of skills that are fundamental to the future professional performance of engineers.
- These skills include: Report writing, Public speaking, Project management, Time management, Information searching and management, Problem solving, Working creatively, Working in teams and Managing meetings. *(Please refer to Annex A. -7, where a more detailed description of this work package and a scheme for possible inclusion of these skills in the curriculum is presented).*

### Recommendations to the European Commission

A very important aspect that might be crucial to the development of this kind of work in the future is the **recognition of pedagogical work in career evolution**. All the partners complained that the activities carried in the framework of this Network were very important and even crucial for the development of a common educational practice in Europe. However academic institutions do not recognise this kind of work, which is not considered also for career promotion.

In the same line of behaviour, dissemination of our activities in International conferences is also difficult since the **conference fees** are in most cases **not eligible** for funding in academic institutions. It would be a great benefit for the future activity of Thematic Networks if the **conference fees** could be considered as **eligible** in the dissemination budget.

The Thematic network activity is a very important one and the partnerships formed in Europe can act as service providers for global building of educational structures in Europe.

The work performed by this Thematic Network can be considered as a very useful tool to adapt our curricula to the 3-5-8 format recommended by the European countries ministers for education. The survey on EIE curricula in Europe will help to understand the differences and can provide guidelines to achieve a harmonisation of curricula in EIE.

This kind of work can be achieved only through a representative network of institutions. In this sense, the consortium we propose is composed of more than 60 institutions from all around Europe, and lays on the **EAEIE (European Association for Education in Electrical and Information Engineering - <http://www.eaeie.org>.)** this association of teachers in EIE in Europe being a very useful tool for dissemination.

**Part 3: Project results and products**  
**Section A - Summary tables**

<b>Table 1: Conferences and seminars</b>			
Title of event	Location (use country codes on p. 2)	Number of participants	Type of dissemination of results C codes
Colloque <b>CETSIS-EEA</b> , Clermont-Ferrand, France, 29-30 octobre 2001 (accepted to be published). Le réseau thématique THEIERE : nouvelles technologies et harmonisation des cursus pour l'université de demain - THIRIET, J.M.; MARTINS M.J.; ROBERT M.	FR		C3
<b>Annual Scientific Conference on Web Technology, New Media, Communications and Telematics Theory, Methods, Tools and Applications.</b> (6th, Valencia, 2001).-Delft (The Netherlands): Remote Data Acquisition over Internet - LEMUS, L.G.; BENLLOCH, J.V.; BUENDÍA, F.; GARCÍA, J.M. y BAYO, J.L.: - En ESTEVE DOMINGO, M. ; GUERRI CEBOLLADA, J.C. and PALAU SALVADOR, C. (Eds.): SCS Europe Publication, 2001.- pp. 39-42.	NL		C3
<b>International Workshop on Multimedia Applications</b> (1st, Valencia, 2001) (proceedings in print). Desarrollo de recursos didácticos multimedia, accesibles desde Internet, en un contexto europeo - BENLLOCH, J.V.; BUENDÍA F.; GÓMEZ J.M.; LEMUS, L.; AGUSTÍ, M. y RODAS, A.	ES		C3
<b>World Conference on Telemedicine Toulouse 2000</b> , Design of 3D Anatomical Models for Medical and Multidisciplinary Educational Activities - F. Klett, D. Dimitrov, S. Hoene - Proceedings pp. 84-85.	FR		C3
<b>Jahrestagung der Deutschen Gesellschaft für Akustik DAGA</b> Oldenburg 2000, Multiple Darstellung der akustischen Wahrnehmung in der universitären Akustik-Lehre - F. Klett, S. Hoene, D. Mayer-Ullmann - 26. Tagungsband pp. 734-735.	DE		C3
<b>IEEE Interdisciplinary Conference on Electrical, Electronics and Computer Engineering Education</b> Davos 2000. (proceedings in print). Hypermedia and the Communication Aims in Engineering Learning Environments - F. Klett.	CH		C3
<b>ISTET 2001</b> , Linz (Austria), 19th-22nd August 2001. A novel approach for teaching electrodynamics - M. HOFFMANN.	AT	120	C3
<b>Jahrestagung der Deutschen Gesellschaft für Akustik DAGA</b> Hamburg 2001 Simulation und Interaktion in Real-Time-3D-Lernumgebung für akustische Lehrinhalte - F. Klett - 27.	DE		C3

<p><b>IEEE International Conference on Advanced Learning Technologies</b> Madison/Wisconsin 2001. (proceedings in print). A framework for Design and Interaction in 3D Real-time Learning Environments - F. Klett.</p>	US		C3
<p><b>12th EAEEIE Conference</b> Nancy 2001, May 14 - 16, 2001, Nancy, France, "Innovations for Education in Electrical and Information Engineering", 31 papers connected with the activities achieved within or around the thematic network have been presented during the conference (<a href="http://www.eaeeie.org/theiere/conferences.html">http://www.eaeeie.org/theiere/conferences.html</a>) .</p>	FR	101	C3
<p><b>Simposio Internacional de Informática Educativa (2º Puertollano, Ciudad Real, 2000). Informática y educación para una sociedad interconectada.</b>- Asociación para el Desarrollo de la Informática Educativa (ADIE), 2000. Desarrollo de recursos didácticos basados en la simulación para enseñanza no presencial. [CD-ROM] - BUENDÍA GARCÍA, F.; BENLLOCH DUALDE, J.V. y GÓMEZ SORIANO, J.M.: .- En ORTEGA, M. y BRAVO, J. (Eds.).</p>	ES		C3
<p><b>4th UICEE Annual Conference on Engineering Education</b>, Bangkok, Thailand, 7-10 February 2001.</p> <ul style="list-style-type: none"> <li>• A transform method to teach Maxwell-Theory - M. HOFFMANN</li> <li>• Enterprise training and development in an electronics undergraduate programme - A. WARD</li> </ul>	Thailand	190	C3
<p><b>ITHET2001</b>, 04-06 July 2001, Kumamoto (Japan).</p> <ul style="list-style-type: none"> <li>• A computer aided learning package for tolerance analysis - T. WARD &amp; K. SHAWWA</li> <li>• A novel approach to higher education in Electrical, electronics and Information Engineering - M. HOFFMANN</li> <li>• Visualization of Assembly - Code conversion into machine code - P. LAPPALAINEN</li> <li>• Why a Virtual Campus in technical and technological teaching? - O. BONNAUD, Y. DANTO</li> <li>• Microelectronics Technology Course for a Virtual Campus - O. BONNAUD</li> </ul>	Japan	200	C3
<p>MSE01, Poster, Las Vegas – NV (USA) June 2001, Proc. <b>IEEE Int. Conf. on Microelectronic Systems Education</b>. Interactive Microelectronics Technology Course Available on Website - O. BONNAUD, P. MÜNSTER, H. LHERMITE, C. DIACONESCU</p>	USA	120	C3
<p><b>6èmes Journées pédagogiques du CNFM</b>, JPCNFM'2000, Saint-Malo, France, 29 novembre-1er décembre 2000 O. BONNAUD, S. VERMEULEN, P. MUNSTER, S. CAMPION, D. DANILOVIC - "Cours de technologie microélectronique interactif sur Internet : une nouvelle approche de la discipline".</p>	FR	100	C3
<p><b>IV Congreso de Tecnologías Aplicadas a la Enseñanza de la Electrónica TAEE'2000</b>, 13-15 Septiembre 2000, Barcelona, España J. V. BENLLOCH, J. M. GÓMEZ, F. BUENDÍA "Recursos didácticos para la enseñanza de la instrumentación electrónica a través de la red", Vol II, pp 365-368, ISBN 84-600-9596-7.</p>	ES		C3

<p><b>4th IFAC International Symposium on Intelligent Components and Instruments for Control Applications</b>, Buenos Aires , Argentina, 13-15 September 2000  J.M. THIRIET, M. ROBERT, B. CONRARD - "Curricula reachable via Internet for teaching intelligent instruments" - pp. 189-194.</p>	Argentina		C3
<p><b>PHYTEB 2000</b>, Barcelona, España, 27 Aug., 1st Sept. 2000  M. J. MARTINS, M. ROBERT, J.M. THIRIET - Linking teachers and students via WWW</p>	ES	400	C3
<p><b>Colloque international TICE 2000</b> (Technologies de l'Information et de la Communication dans les Enseignements d'Ingénieurs et dans l'Industrie), Troyes, France, 17-20 octobre 2000.  M. ROBERT, J. M. THIRIET, P. GEND - Vers un cursus européen en "Electrical and Information Engineering", le réseau thématique SOCRATES INEIT MUCON.</p>	FR		C3
<p>Microsensors in process industry (national seminar), S. MYLGAVANAM, Porsgrunn</p>	NO	27	C3
<p>International Metrology Conference</p>	Bucharest (Romania)	150	C3
<p>Metrology Conference</p>	Sozopol (Bulgaria)	80	C3
<p>Seminar in Rousse by professor Roth on tele-labs</p>	Rousse (Bulgaria)	30	C3
<p>2º Simposio Internacional de Informática Educativa. SIIE'2000. Informática y educación para una sociedad interconectada. Puertollano, Ciudad Real, 15-17 Noviembre, 2000.  BUENDÍA GARCÍA, F.; BENLLOCH DUALDE, J.V. y GÓMEZ SORIANO, J.M.: <i>Desarrollo de recursos didácticos basados en la simulación para enseñanza no presencial [CD-ROM]</i>.</p>	ES	150	Evaluation
<p>Sixth Annual Scientific Conference on Web Technology, New Media, Communications and Telematics Theory, Methods, Tools and Applications. Euromedia'2001. Valencia, April 18-20, 2001.  LEMUS, L.G.; BENLLOCH, J.V.; BUENDÍA, F.; GARCÍA, J.M. y BAYO, J.L.: <i>Remote Data Acquisition over Internet</i>, pp. 39-42.  Society for Computer Simulation.</p>	ES	250	Evaluation
<p>Intermedia 2001. International Workshop on Multimedia Applications. Valencia, May 2-4, 2001 BENLLOCH, J.V.; BUENDÍA F.; GÓMEZ J.M.; LEMUS, L.; AGUSTÍ, M. y RODAS, A.: <i>Desarrollo de recursos didácticos multimedia, accesibles desde Internet, en un contexto europeo [CD-ROM]</i>.</p>	ES	300	Evaluation
<p>ED-MEDIA 2001. World Conference on Educational Multimedia, Hypermedia &amp; Telecommunications. Tampere, June 25-30, 2001.  BENLLOCH, J.V.; BUENDÍA, F.; AGUSTÍ, M.; GIL, J. A. &amp; RODAS, A.: <i>Developing Web-based Courses on Computing Using a Hypermedia Model</i>, pp 129-130.  BURGUILLO, J.C.; BENLLOCH, J.V.; SANTOS, J.M.; RODRÍGUEZ, D.A. &amp; BUENDÍA, F.: <i>X-Quest: An Open Tool to Support Evaluation in Distance Learning</i>, pp 220-221.  Association for the Advancement of Computing in Education</p>	FI	1000	Evaluation

27 <sup>th</sup> Euromicro Conference. Workshop on Multimedia and Telecommunication. Warsaw, September 4-6, 2001. BUENDÍA, F.; DIAZ, P.; SAHUQUILLO, J.; BENLLOCH, J.V.; GIL, J. A. & AGUSTÍ, M: <i>XEDU, a Framework for Developing XML-based Didactic Resources</i> , pp 427-434. IEEE Computer Society, 2001,.	PL	200	Evaluation
Jornadas de Innovación Educativa. Metodologías activas y evaluación. Valencia, 24-27 Septiembre, 2001. BENLLOCH, J.V.; BUENDÍA, F.; LEMUS, L.; AGUSTÍ, M.; & RODAS, A.: <i>Los simuladores como núcleo de los recursos didácticos multimedia accesibles desde Internet [CD-ROM]</i> . Instituto de Ciencias de la Educación, Universidad Politécnica de Valencia.	ES	700	Evaluation
3 <sup>er</sup> Simposio Internacional de Informática Educativa, Viseu, 26-28 Septiembre, 2001. BUENDÍA, F.; BENLLOCH, J.V.; GÓMEZ, J.M.; BURGUILLO, J.C. y RODRIGUEZ, D.: <i>Herramientas para la gestión de recursos didácticos accesibles desde Internet, en un contexto europeo europeo [CD-ROM]</i> .	PT	150	Evaluation
Information technology for teaching process (local university event), J. LIGUS, Kosice	SK	15	C3

<b>Table 2: Materials, publications, modules, courses, reports, studies etc.</b>		
<b>Type of product</b> A codes *	<b>Title of the product</b>	<b>Type of dissemination</b> C codes
A6	Curriculum Survey on Instrumentation and Control	C6
A1	Common framework for structuring didactic materials	C6
A1	Teaching Module on Microsensors for Process Industry	C6
A1	Teaching Module on Measurement and Control	C6
A1	Database of Courses in Instrumentation and Control	C6
A1	Instrumentation Amplifiers	C6
A6	Curriculum on Electrical Measurements	C6
A4	A Computer Aided Learning Package for Tolerance Analysis	C6
A1	Control & Instrumentation Telelaboratory "Control and monitoring of the campus heating system"	C6
A2	Behavioural (non-technical) Skills Group Activity Report	C8
A11	Behavioural (non-technical) Skills Web resource	C6
A1	Radio Frequency Transmission Line Simulator	C6
A1	Electronic noise in Wireless RF and Microwave systems	C6
A 2	Paper: " Computer restoration of medical images with noise spectrum" IWK, TU-Ilmenau, Germany ,24-27September	C3
A2	An Internet project to achieve Curricula Harmonisation	C2
A1	Outil Pédagogique d'initiation à la microélectronique	C2,C3,C6
A1	THE CONTRIBUTION TO THE DEEPER UNDERSTANDING OF THE FIELD OPERATORS IN THE ELECTROMAGNETIC FIELD THEORY	C6, C2
A5	The virtual Laboratory - the digital multimeter	C6
A1	Module Educational Media	C6
A1	Parallel Matrix Multiplication Algorithm – Multimedia presentation on Internet	C6
A1	GDE – Tool Supporting Application Development for Message-Passing Environments	C6
A 2	1.Paper: "System for telemedicine", 12 <sup>th</sup> International Conference EAEEIE2001 , Nancy,France 14-16 May 2001	C3
A1	Course on "Pulse modulation"	C6
A1	Course on "Sensors"	C6
A1	Course on "Digital Signal Processing"	C6

## Part 3: Project results and products

### Section B: Course/module profile

#### Course/module title

Common framework for structuring didactic materials

#### Course/module objectives

One of the *Theiere* goals is the development of pieces of pedagogical tools available through the Internet. One of the main difficulties to be achieved is to co-ordinate a high number of sparse partners developing different educational resources on multiple fields. The current proposal intends to provide a common framework in order to structure and to organise these resources.

The framework defines a hierarchical structure for the project, which can be divided into 8 main areas: Computers and Information Systems, Communications, Electronics, Power Systems, Instrumentation and Control, Internet Services and Applications, Fundamental, and Virtual Labs. Each area has a lead site which co-ordinates the development of didactic resources performed by its members.

This hierarchical structure is divided into several levels. The first level is represented by the "package" entity and it is associated to each project area. The next level is represented by the "subpackage" entities and they have to be developed by the area members. Both are defined as XML-based documents, which can be distributed and interchanged between the partners.

Units that point to the final educational contents compose the "sub-package" entities. These contents can be implemented using any Internet standard such as HTML, PDF, or XML-based documents. In the last case, it would be advisable that these documents were compliant with learning object standards such as IMS.

Finally, the global THEIERE package information can be published in a Web page.

#### Course/module profile

Location (town and country)	Course profile G codes	Language 1 (use language codes on p. 2)	Language 2* (use language codes on p. 2)	Date planned
Valencia. Spain	G5, G8	EN	ES	2001-2003

#### Profile of participants

Nationality/is (use country codes on p. 2)		Sector D codes	Category E codes	Subject area(s) F codes
country	number of participants			
All TN partners	120	D5	E 4, E 10, E12, E 13	F 6

**Course fee in EUR per participant**

free

**Further information on the course/module may be obtained from:**

Name:	Félix Buendía-García		
Institution:	E.U. Informática. Universidad Politécnica de Valencia		
Address:	Camino de Vera s/n		
Post code:	46022	Town: Valencia	Country: Spain
Tel.: + 34 963877575	Fax: + 963877579	E-mail: fbuendia @disca.upv.es	

**Course/module title**

Instrumentation Amplifiers

**Course/module objectives**

To teach students what is an instrumentation amplifier, why it is used, the basic circuits, the main parameters and how each of the schemes work and where it is used in the practice.

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile</b> G codes	<b>Language 1</b> (use language codes on p. 2)	<b>Language 2*</b> (use language codes on p. 2)	<b>Date planned</b>
Rousse, Bulgaria	G2	EN	BG	September 2001

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

<b>Nationality/is</b> (use country codes on p. 2)		<b>Sector</b> D codes	<b>Category</b> E codes	<b>Subject area(s)</b> F codes
country	number of participants			
BG	200	D5	E4	F6

**Course fee in EUR per participant**

0

**Further information on the course/module may be obtained from:**

Name:	George Georgiev		
Institution:	Rousse Univ.		
Address:	8, Studentska street		

Post code: 701	Town: Rousse	Country: Bulgaria
Tel.: + 35 9 8244507 256	E-mail: gsg @ru.acad.bg	Fax: +

**Course/module title**

Curriculum Survey on Instrumentation and Control

**Course/module objectives****Report:**

According to the project assignment we have surveyed the available curriculum in the area '**Instrumentation and Control**' in Universities and University Colleges in **NORWAY, UK, GERMANY** and **SLOVAKIA** for students. The main aim of this project was to help the prospective students to get the detailed information in related course in these countries and help for mobility of exchange programme. They can also acquire the basic level to attend those courses.

**Norway:**

In Norway the '**Instrumentation and control**' related courses are found in four Universities and four University Colleges in Postgraduate level and in 10 other University Colleges in Undergraduate levels. The courses are all taught in Norwegian. The pedagogical tools such as type of course, course content, duration, teaching method, evaluation, prerequisites etc are noted. There are about 28 courses found in 18 institutions.

**UNITED KINGDOM:**

In UK the '**Instrumentation and Control**' related 88 courses are found in 44 Universities and Colleges. The courses are all taught in English. Detailed information about type of course, course content, duration, level of the course etc are noted.

**GERMANY:**

In GERMANY the '**Instrumentation and Control**' related 37 courses are surveyed in 19 different Universities and in all these courses German language is the medium of instruction.

**SLOVAKIA:**

In GERMANY the '**Instrumentation and Control**' related 28 courses are surveyed in 3 different Universities and in all these courses Slovak language is the medium of instruction.

**Course/module profile**

Location (town and country)	Course profile G codes	Language 1 (use language codes on p. 2)	Language 2* (use language codes on p. 2)	Date planned

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

Nationality/is (use country codes on p. 2)		Sector D codes	Category E codes	Subject area(s) F codes
country	number of participants			

--	--	--	--	--

**Course fee in EUR per participant**

--

**Further information on the course/module may be obtained from:**

Name:	Saba Mylvaganam		
Institution:	Telemark University College		
Address:	Kjoelnesringt 56		
Post code:	N-3914	Town: Porsgrunn	Country: Norway
Tel.: + 47 35575151	Fax: + 47 35575250	E-mail: sabam@pors.hit.no	

**Course/module title**

Teaching Module on Microsensors for Process Industry
--

**Course/module objectives**

<p><b>Report:</b></p> <p>This course was planned in conjunction with SINTEF and Telemark University College. The aim of the course was to give an introduction to the principles, fabrication of micro sensors and case studies involving their usage in the process industry. Types of sensors discussed were traditional Pt-100 sensors in micro sensor form, Hall sensors, pressure sensors developed for high temperature and high-pressure applications. Case studies involving their usage in the molten metal industries and their process simulation and in the sub-sea drilling activities were also discussed.</p> <p>The participants were mainly from the industry and from the academia including some PhD D students.</p>
---

**Course/module profile**

Location (town and country)	Course profile G codes	Language 1 (use language codes on p. 2)	Language 2* (use language codes on p. 2)	Date planned
Porsgrunn	G1			June 2001

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

Nationality/is (use country codes on p. 2)		Sector D codes	Category E codes	Subject area(s) F codes
country	number of participants			
Norway	27	D13	E4, E13, E 15	F6

**Course fee in EUR per participant**

Free
------

**Further information on the course/module may be obtained from:**

Name:	Saba Mylvaganam
-------	-----------------

Institution:	Telemark University College		
Address:	Kjoelnesringt 56		
Post code:	N-3914	Town: Porsgrunn	Country: Norway
Tel.: + 47 35575151	Fax: + 47 35575250	E-mail: sabam@pors.hit.no	

**Course/module title**

Teaching Module on Measurement and Control

**Course/module objectives****Report:**

Module consists of the following:

**1. presentation of DISTRIBUTED CONTROL SYSTEM**

presentation consists of five slides

- general scheme of distributed control
- the possibilities of instrumentation connections
- methods of basic design of closed-loop circuits

**2. presentation of INFORMATTED SUBSYTSEM OF CONTROLLED SYSTEM**

presentation consists of one slide because it is more detailed

**3. web page with description of the DDE COMMUNICATION**

this reference page consists of more web pages which involve subject of DDE Communication, I would like to emphasise applications ( downloading of program modules)

**4. pd. file with description of the SENSORS (elements)**

there are about twenty pdf file to demonstrate you sensors structure

**5. mathematics background of control (control)**

solving of differential equation, many examples and homework's

**6. real presentation (applications)**

there are presentations of real company on the portal

**7. web tests page (test)**

there are about seven test web pages to check-up your acquired knowledge

**Course/module profile**

Location (town and country)	Course profile G codes	Language 1 (use language codes on p. 2)	Language 2* (use language codes on p. 2)	Date planned
Kosice, Slovakia	G11 (Internet course)			

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

Nationality/is (use country codes on p. 2)		Sector D codes	Category E codes	Subject area(s) F codes
country	number of participants			
Slovakia	NA	D4	E4	F6

**Course fee in EUR per participant**

Free

**Further information on the course/module may be obtained from:**

Name:	Jan Ligus		
Institution:	Technical University of Kosice		
Address:	Letna 9		
Post code:	040 01	Town: Kosice	Country: Slovakia
Tel.: + 421 95 6022575	Fax: + 421 956022575	E-mail: ligus@tuke.sk	

**Course/module title**

Database of Courses in Instrumentation and Control
--

**Course/module objectives**

<p><b>Report:</b></p> <p><b>Objective of the module</b></p> <p>Module of database for work with curriculum of courses and relevant materials is determined for the followed purposes:</p> <ul style="list-style-type: none"> <li>• search engine of courses according to: <ul style="list-style-type: none"> <li>○ Country, university, types of course, lectors and key words.</li> </ul> </li> <li>• Administrator work with courses: <ul style="list-style-type: none"> <li>○ Adding the course, modifying the course, deleting the course.</li> </ul> </li> <li>• work with users, create new user</li> </ul>
---

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile G codes</b>	<b>Language 1 (use language codes on p. 2)</b>	<b>Language 2* (use language codes on p. 2)</b>	<b>Date planned</b>
Kosice, Slovakia	G11 (Internet course)			

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

<b>Nationality/is (use country codes on p. 2)</b>		<b>Sector D codes</b>	<b>Category E codes</b>	<b>Subject area(s) F codes</b>
<b>country</b>	<b>number of participants</b>			
Slovakia	NA	D4	E4	F6

**Course fee in EUR per participant**

<b>Free</b>
-------------

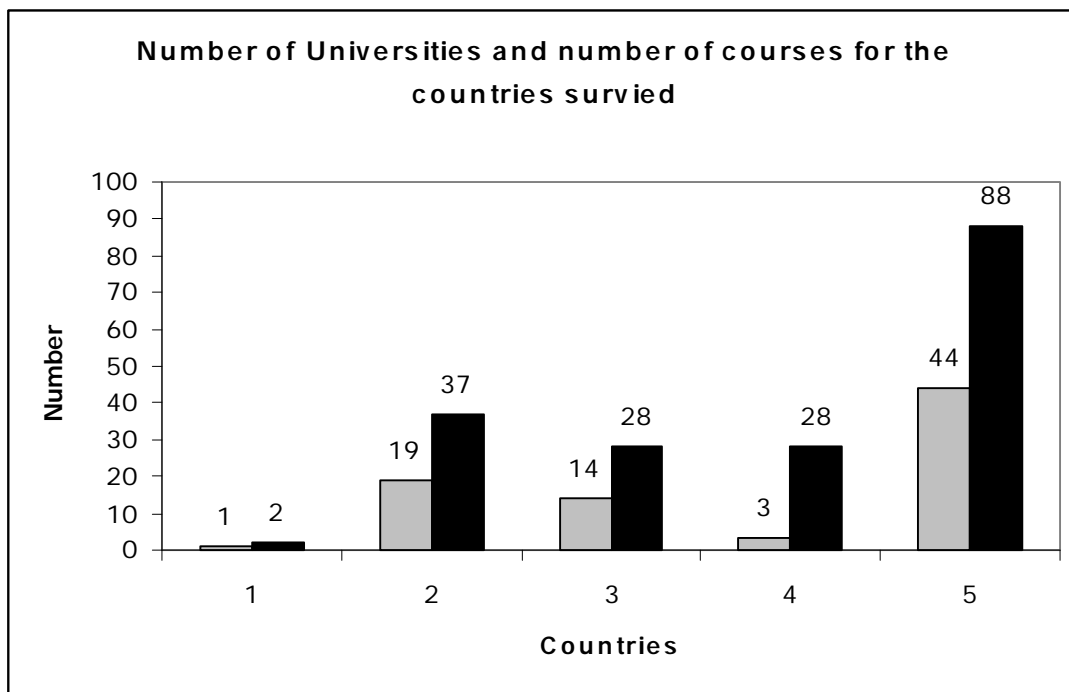
**Further information on the course/module may be obtained from:**

Name:	Jan Ligus
Institution:	Technical University of Kosice

Address:	Letna 9				
Post code:	040 01	Town:	Kosice	Country:	Slovakia
Tel.:	+ 421 95 6022575	Fax:	+ 421 956022575	E-mail:	ligus@tuke.sk

**Table 1. Survey of courses in instrumentation and control in selected countries**

Country	France	Germany	Norway	Slovakia	United Kingdom
Number of Universities	1	19	14	3	44
Number of courses	2	37	28	28	88



**Countries**

- 1. France
- 2. Germany
- 3. Norway
- 4. Slovakia
- 5. United Kingdom

**Color:**

- Number of universities
- Number of courses

**Figure 1. Number of universities and number of courses used in the survey**

**Course/module title**

A Computer Aided Learning Package for Tolerance Analysis

**Course/module objectives**

The objective of this project was to develop a Computer Aided Learning package to support students in the learning of electronic circuit tolerance analysis. The package includes an introduction to tolerance analysis and examples of some of the different methods of tolerance analysis that can be applied to electronic circuits. The objective of the project was to take CAL package design a stage further than simply creating a package presenting technical material. Consideration has been given to pedagogical aspects such as how the learner can gain the information required in the most appropriate way for them. This has been achieved through the use of a simple psychometric learning style preference assessment, the output of which can be used to guide the student through the course content in a style sympathetic to their individual preference. Further consideration has been given to inclusivity across the student population by considering, and providing for some of the more common disabilities. At the practical level the CAL package has been written in HTML and JAVA script. The final product has been initially tried on students in their second year of undergraduate study, with very good feedback.

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile G codes</b>	<b>Language 1 (use language codes on p. 2)</b>	<b>Language 2* (use language codes on p. 2)</b>	<b>Date planned</b>
York, England	G4	UK		June 2001

**Profile of participants**

<b>Nationality/is (use country codes on p. 2)</b>		<b>Sector D codes</b>	<b>Category E codes</b>	<b>Subject area(s) F codes</b>
<b>country</b>	<b>number of participants</b>			
UK	86	D5	E4	F6

**Course fee in EUR per participant**

0

**Further information on the course/module may be obtained from:**

Name: A. E. Ward  
 Institution: University of York  
 Address: Department of Electronics  
 Post code: YO10 5DD Town: York Country: England  
 Tel.: + 44 1904 433021 Fax: + 44 1904 432335 E-mail: aew@ohm.york.ac.uk

**Course/module title**

Outil Pédagogique d'initiation à la microélectronique

**Course/module objectives**

Initiation to the microelectronics technology for undergraduate and graduate students. It prepares the students to work in a clean room. The aims of this tool is to improve the qualitative understanding physical and technological phenomena with the helps

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile</b> G codes	<b>Language 1</b> (use language codes on p. 2)	<b>Language 2*</b> (use language codes on p. 2)	<b>Date planned</b>
FR	G4, G8, H8, J1, J2, J3, J4, J5	FR, EN, RO, FI		2001: FR, RO 2002: EN, FI

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

<b>Nationality/is</b> (use country codes on p. 2)		<b>Sector</b> D codes	<b>Category</b> E codes	<b>Subject area(s)</b> F codes
<b>country</b>	<b>number of participants</b>			
FR	200	D4,D5,D9	E1,E2,E4,E15	F6
RO	46	D4,D5,D9	E1,E2,E4,E15	F6

**Course fee in EUR per participant**

Free
------

**Further information on the course/module may be obtained from:**

Name:	Olivier BONNAUD		
Institution:	Université de Rennes 1		
Address:	Campus de Beaulieu		
Post code:	35042	Town: Rennes cedex	Country: France
Tel.: + 33 (0)2 99 28 60 71	Fax: + 33 (0)2 99 28 16 74	E-mail: olivier.bonnaud @univ-rennes1.fr	

**Course/module title**

Behavioural (non-technical) Skills Group Activity Report
--

**Course/module objectives**

Report on the activities of the Behavioural (non-technical) skills group. The report provides a set of definitions for the behavioural skills and the start of a list of books, papers and articles and web resources that can be used by students and teachers as part of the development of behavioural skills. The skills include Report writing, Public speaking, Project management, Time management, Information searching and management, Problem solving, Working creatively, Working in teams and Managing meetings.
---

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile</b> G codes	<b>Language 1</b> (use language codes on p. 2)	<b>Language 2*</b> (use language codes on p. 2)	<b>Date planned</b>
York, England	G4	UK		June 2001

**Profile of participants**

<b>Nationality/ies</b> (use country codes on p. 2)		<b>Sector</b> D codes	<b>Category</b> E codes	<b>Subject area(s)</b> F codes
<b>country</b>	<b>number of participants</b>			
UK	350	D5	E4	F6

**Course fee in EUR per participant**

Nil
-----

**Further information on the course/module may be obtained from:**

Name:	A. E. Ward		
Institution:	University of York		
Address:	Department of Electronics		
Post code:	YO10 5DD	Town: York	Country: England
Tel.: + 44 1904 433021	Fax: + 44 1904 432335	E-mail: aew@ohm.york.ac.uk	

**Course/module title**

Behavioural (non-technical) Skills Web resource
---

**Course/module objectives**

Web resource for the Behavioural (non-technical) skills group. The web pages provides the start of a list of books, papers and articles and web resources and learning notes that can be used by students and teachers as part of the development of behavioural skills. The skills include Report writing, Public speaking, Project management, Time management, Information searching and management, Problem solving, Working creatively, Working in teams and Managing meetings.
--

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile</b> G codes	<b>Language 1</b> (use language codes on p. 2)	<b>Language 2*</b> (use language codes on p. 2)	<b>Date planned</b>
York, England	G4	UK		June 2001

**Profile of participants**

<b>Nationality/ies</b>	<b>Sector</b>	<b>Category</b>	<b>Subject area(s)</b>
------------------------	---------------	-----------------	------------------------

(use country codes on p. 2)		D codes	E codes	F codes
country	Number of participants			
UK	350	D5	E4	F6

**Course fee in EUR per participant**

Nil
-----

**Further information on the course/module may be obtained from:**

Name:	A. E. Ward		
Institution:	University of York		
Address:	Department of Electronics		
Post code:	YO10 5DD	Town: York	Country: England
Tel.: + 44 1904 433021	Fax: + 44 1904 432335	E-mail: aew@ohm.york.ac.uk	

**Course/module title**

THE CONTRIBUTION TO THE DEEPER UNDERSTANDING OF THE FIELD OPERATORS IN THE ELECTROMAGNETIC FIELD THEORY
---

**Course/module objectives**

<i>The primary goal of the package</i> is to explain in detail the mathematical and particularly the physical meaning of the main field operators – gradient, divergence, curl and Laplace’s operator and consequently to contribute to their deeper understanding by the students of electrical engineering in the basic period of their university study. According to many years experience this topic belongs to the critical points in the teaching of electromagnetic fields solution in the closed region and with the defined boundary conditions. Therefore <i>the secondary goal of the package</i> is to help the students to cope with this topic and consequently to attract them to study of electromagnetic field theory.
--

**Course/module profile**

Location (town and country)	Course profile G codes	Language 1 (use language codes on p. 2)	Language 2* (use language codes on p. 2)	Date planned
Bratislava, Slovakia	G4	EN		2001

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

Nationality/ies (use country codes on p. 2)		Sector D codes	Category E codes	Subject area(s) F codes
country	number of participants			
SK	28	D5	E4	F6

**Course fee in EUR per participant**

500. -

**Further information on the course/module may be obtained from:**

Name:	Assoc. Prof. Jozef Jasenek		
Institution:	Slovak University of Technology, Faculty of Electrical Engineering and Information Technology		
Address:	Ilkovicova St. No. 3		
Post code:	812 19	Town: Bratislava	Country: Slovakia
Tel.: +421 2 60291737	Fax: +421 2 65420415	E-mail: jasenek@elf.stuba.sk	

**Course/module title**

Educational Media

**Course/module objectives**

The learning environment is predestined for students of media courses of study as well as any users interested in the backgrounds and the expansion of the media technology. The environment serves in teaching as well as in self-study. It includes the flexibility to facilitate the learner in determined situations the access to information in various depths.

The application covers at the moment: Hypertext Basics, Electronic Publishing, Visual and Acoustic Perception, Visual and Acoustic Illusions, Sound Converter. The modules are all interactive and realised in accordance with the actual theories of knowledge that describe the learning process as a web of concepts and the relations between these instances.

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile G codes</b>	<b>Language 1 (use language codes on p. 2)</b>	<b>Language 2* (use language codes on p. 2)</b>	<b>Date planned</b>
Ilmenau, Germany		German		

\* please specify **one code only** for each of the categories involved; multiple choices are possible for all other categories

**Profile of participants**

<b>Nationality/ies (use country codes on p. 2)</b>		<b>Sector D codes</b>	<b>Category E codes</b>	<b>Subject area(s) F codes</b>
<b>country</b>	<b>number of participants</b>			
DE	60			

**Course fee in EUR per participant**

Free

**Further information on the course/module may be obtained from:**

Name:	Fanny Klett		
Institution:	Ilmenau Technical University		
Address:	P.O. Box 10 05 65		
Post code:	98684	Town: Ilmenau	Country: Germany
Tel.:	+49/3677/69 26 71	Fax: +49/3677/69 12 55	E-mail: Fanny.Klett @ RZ.TU-Ilmenau.DE

**Course/module title**

Course "Pulse modulation"
---------------------------

**Course/module objectives**

The main goal of the course "Pulse modulation is to bring together different kinds of pulse modulations, which are used in communication technology and in the cases of treatment of digital signals in computer sciences, also. So, this is the way for one fundamental presentation of basic requirements for pulse modulation as one previous process before digital and computer treatment of signals. An explanation and interpretation of theorem of Kotelnikow- Niqwist in engineering is given. There are both theoretical descriptions and practical interpretations in engineering of different pulse modulations as amplitude-pulse modulation, frequency-pulse modulation, etc. in the course. The interpretation in the time area is connected to the interpretation in the frequency area. An influence of noise on the pulse-modulated signals is described in the course, also.

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile G codes</b>	<b>Language 1 (use language codes on p. 2)</b>	<b>Language 2* (use language codes on p. 2)</b>	<b>Date planned</b>
Sofia, Bulgaria	G 2	BG	EN	April, May 2002

**Profile of participants**

<b>Nationality/ies (use country codes on p. 2)</b>		<b>Sector D codes</b>	<b>Category E codes</b>	<b>Subject area(s) F codes</b>
<b>country</b>	<b>number of participants</b>			
BG	130	D5	E 4	F 6

**Course fee in EUR per participant**

<b>FREE</b>
-------------

**Further information on the course/module may be obtained from:**

Name:	Assoc.Prof.Dr. Dimiter Tz. Dimitrov		
Institution:	Technical University of Sofia,Bulgaria		
Address:	Student town-Sofia, P.O.Box 27, 1799 Sofia, Bulgaria		
Post code:	1799	Town: Sofia	Country: Bulgaria
Tel.:	+ 359 (2) 9652278	Fax: + 359(2)758786	E-mail: dcd @vmei.acad.bg

**Course/module title**

Course "Sensors"
------------------

**Course/module objectives**

<p>The Instrumentation &amp; Sensors Package is designed in order to emphasise the role of measurement in all technical activities.</p>
---

<p>Measurement is at the basis of a lot technical activities because a main part of actions is done after an observation of the environment; so in the technical world sensors are so called " weak link " because, in Control System, a lot of decision are based on measurement information provided by sensors.</p>
--

<p>This is the updating of a course designed during the INEIT-MUCON thematic network.</p>
---

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile</b> G codes	<b>Language 1</b> (use language codes on p. 2)	<b>Language 2*</b> (use language codes on p. 2)	<b>Date planned</b>
Nancy, France	G 2	EN, FR	EN	May 2002

**Profile of participants**

<b>Nationality/ies</b> (use country codes on p. 2)		<b>Sector</b> D codes	<b>Category</b> E codes	<b>Subject area(s)</b> F codes
<b>country</b>	<b>number of participants</b>			
FR	30	D5	E 4	F 6

**Course fee in EUR per participant**

FREE
------

**Further information on the course/module may be obtained from:**

Name:	Pr. Michel ROBERT		
Institution:	Université Henri Poincaré Nancy 1		
Address:	ESSTIN, 2, rue Jean Lamour,		
Post code:	54500	Town: Vandoeuvre cedex	Country: France
Tel.: + 33 (0) 3 83 50 16 11	Fax: + 33 (0) 3 83 54 21 73	E-mail: michel.robert@esstin.uhp-nancy.fr	

**Course/module title**

Course "Signal processing"
----------------------------

**Course/module objectives**

The Signal processing Resource is designed in order to emphasise the role of signal processing, useful in various sub-fields of Electrical and Information Engineering.  
This is the updating of a course designed during the INEIT-MUCON thematic network.

**Course/module profile**

<b>Location (town and country)</b>	<b>Course profile</b> G codes	<b>Language 1</b> (use language codes on p. 2)	<b>Language 2*</b> (use language codes on p. 2)	<b>Date planned</b>
Nancy, France	G 2	EN, FR	EN	May 2002

**Profile of participants**

<b>Nationality/ies</b> (use country codes on p. 2)		<b>Sector</b> D codes	<b>Category</b> E codes	<b>Subject area(s)</b> F codes
<b>country</b>	<b>number of participants</b>			
FR	70	D5	E 4	F 6

**Course fee in EUR per participant**

<b>FREE</b>
-------------

**Further information on the course/module may be obtained from:**

Name:	Jean-Marc Thiriet		
Institution:	Université Henri Poincaré Nancy 1		
Address:	ESSTIN, 2, rue Jean Lamour,		
Post code:	54500	Town: Vandoeuvre cedex	Country: France
Tel.: + 33 (0) 3 83 50 33 14	Fax: + 33 (0) 3 83 54 21 73	E-mail: jean-marc.thiriet@esstin.uhp-nancy.fr	

## Part 3: Project results and products

### Section C: Profile - Materials, certification systems, reports and studies

Please note that **one profile form must be completed for each set of materials / certification system / report / study included in Table 2** prepared or undertaken during the eligibility period.

#### Title of the product

The virtual Laboratory – part 2 – the digital multimeter

#### Key themes / topics / methodologies

How to use a digital M/M, how it works, tutorial. Uses vector graphics to demonstrate the practice and principles of a digital multimeter. This is added to the previous module – the oscilloscope.

#### Materials characteristics

Product type* A codes	Language 1 (use country codes on p. 2)	Language 2* (use country codes on p. 2)	User profile D, E and F codes	Media / format H codes	Learning environment J codes	Stage of development B codes
A5	EN		D5,D4,E4,E9	H 8	J4	complete

#### Availability

Date of publication / production	Available free of charge on request?	If no, state retail price in EUR
July, 2001	Yes	N/a
<b>Details of supplier</b> Name: M.F.Diprose Institution: University of Sheffield, Department of Electronic and Electrical Engineering, Address: Mappin Street, Post code: S32 3XB. Town: Sheffield. Country: U.K. Tel : +0044 114 222 5356 Fax: +0044 114 272 6391 E-mail: m.f.diprose@ sheffield.ac.uk		

#### Title of the product

Parallel Matrix Multiplication Algorithm – Multimedia presentation on Internet

#### Key themes / topics / methodologies

Parallel Processing, Parallel Algorithms, Matrix Multiplication

Product type* A codes	Language 1 (use country codes on p. 2)	Language 2* (use country codes on p. 2)	User profile D, E and F codes	Media / format H codes	Learning environment J codes	Stage of development B codes

A5	EN		D5,D4,E4,E9	H 8	J4	
----	----	--	-------------	-----	----	--

**Availability**

It is available at address: <http://www.ci.pwr.wroc.pl/~koniecz/ParAlg/Macierz.html>

<b>Date of publication / production</b> 30.08.2001	<b>Available free of charge on request?</b> Yes X      No <input type="checkbox"/>	<b>If no, state retail price in EUR</b>
<b>Details of supplier</b>		
Name: Jan Kwiatkowski		
Institution: Wroclaw University of Technology, Computer Science Department		
Address: 50-370 Wroclaw, Wybrzeze Wyspianskiego 27, Poland		
Post code: 50-370	Town: Wroclaw	Country: Poland
Tel : +48 713203602	Fax: + 48 713211018	E-mail: kwiatkowski @ ci-1.ci.pwr.wroc.pl

**Title of the product**

GDE – Tool Supporting Application Development for Message-Passing Environments

**Key themes / topics / methodologies**

Distributed Processing, CASE Tools,

**Materials characteristics**

<b>Product type*</b> A codes	<b>Language 1</b> (use country codes on p. 2)	<b>Language 2*</b> (use country codes on p. 2)	<b>User profile</b> D, E and F codes	<b>Media / format</b> H codes	<b>Learning environment</b> J codes	<b>Stage of development</b> B codes
A5	EN	PL	D5,D4,E4,E9	H 8	J4	

**Availability**

<b>Date of publication / production</b> 30.08.2001	<b>Available free of charge on request?</b> Yes X      No <input type="checkbox"/>	<b>If no, state retail price in EUR</b>
<b>Details of supplier</b>		
Name: Jan Kwiatkowski		
Institution: Wroclaw University of Technology, Computer Science Department		
Address: 50-370 Wroclaw, Wybrzeze Wyspianskiego 27, Poland		
Post code: 50-370	Town: Wroclaw	Country: Poland
Tel : +48 713203602	Fax: + 48 713211018	E-mail: kwiatkowski @ ci-1.ci.pwr.wroc.pl

**Title of the product**

Control & Instrumentation Telelaboratory  
 “Control and monitoring of the campus heating system”

### Key themes / topics / methodologies

#### Main features of the project:

- real control system for 8 MW central heating and hot water distribution system available via Internet for analysis and identification experiments,
- working example of multilevel, industrial control system,
- advanced PLC's on the process level,
- integration via CAN fieldbus technology,
- industrial supervisory control and data acquisition (SCADA) system applied for process visualisation and data acquisition,
- external on-line access to the SCADA system by industrial WWW server,
- process and control data are available via Internet: data plots could be configured by the student,
- available Simulink models of the system components,
- virtual tour through the system: heat exchangers, sensors, valves, controllers etc. could be seen after clicking the active symbols on the screen

Our 2001 activities cover conversion of the main SCADA system pages into English. This job is performed by two graduate students the Department of Control. Dr Krzysztof Kolek and I supervise the students from our department.

### Materials characteristics

Product type* A codes	Language 1 (use country codes on p. 2)	Language 2* (use country codes on p. 2)	User profile D, E and F codes	Media / format H codes	Learning environment J codes	Stage of development B codes
A1	EN	PL	D5,D4,E4,E9	H 8	J4	

### Availability

Date of publication / production September 2001	Available free of charge on request? Yes	If no, state retail price in EUR
<b>Details of supplier</b> Name: W. Grega Institution: Department of Control, University of Mining and Metallurgy Address: Mickiewicza Av Post code: 30-059                      Town: Krakow                      Country: Poland Tel : +48126172096                      Fax: +                      E-mail: wgr @ia.agh.edu.pl		

**Title of the product**

1.Paper: "System for telemedicine", 12<sup>th</sup> International Conference EAEEIE2001 , Nancy, France 14-16 May 2001 ,24-27September

**Key themes / topics / methodologies**

1Distance engineering education in the area of Information technology

**Materials characteristics**

<b>Product type*</b> A codes	<b>Language 1</b> (use country codes on p. 2)	<b>Language 2*</b> (use country codes on p. 2)	<b>User profile</b> D, E and F codes	<b>Media / format</b> H codes	<b>Learning environment</b> J codes	<b>Stage of development</b> B codes
A 2	EN		E10	H1	J4, J5	

**Availability**

<b>Date of publication / production</b>	<b>Available free of charge on request?</b> Yes X <input type="checkbox"/> No <input type="checkbox"/>	<b>If no, state retail price in EUR</b>
<b>Details of supplier</b>		
Name: Assoc.Prof.Dr.Dimiter Tz.Dimitrov		
Institution: Technical University of Sofia, Bulgaria		
Address: P.O.Box 27, 1799 Sofia,Student town		
Post code: 1799	Town: Sofia	Country: Bulgaria
Tel : +359(2)9652278	Fax: + 359(2)758786	E-mail: dcd @ vmei.acad.bg

**Title of the product**

2.Paper: " Computer restoration of medical images with noise spectrum" IWK, TU-Ilmenau, Germany ,24-27September

**Key themes / topics / methodologies**

1.Paper: "System for telemediicine", 12<sup>th</sup> International Conference EAEEIE2001 , Nancy,France 14-16

**Materials characteristics**

<b>Product type*</b> A codes	<b>Language 1</b> (use country codes on p. 2)	<b>Language 2*</b> (use country codes on p. 2)	<b>User profile</b> D, E and F codes	<b>Media / format</b> H codes	<b>Learning environment</b> J codes
A 2	EN		E10	H1	J4, J5

**Availability**

<b>Date of publication / production</b>	<b>Available free of charge on request?</b> Yes X <input type="checkbox"/> No <input type="checkbox"/>	<b>If no, state retail price in EUR</b>
<b>Details of supplier</b>		
Name:	Assoc.Prof.Dr.Dimiter Tz.Dimitrov	
Institution:	Technical University of Sofia, Bulgaria	
Address:	P.O.Box 27, 1799 Sofia, Student town	
Post code:	Town: Sofia	Country: Bulgaria
Tel :	+359(2)9652278 Fax: + 359(2)758786	E-mail: dcd @ vmei.acad.bg

**Title of the product**

RF Transmission Line Simulator
--------------------------------

**Key themes / topics / methodologies**

<p>Transmission Lines, Java applets simulation. A RF Transmission Line with various loads is simulated. So far only DC and AC excitation are considered.</p> <p>A short course is provided on the basic theory, of RF transmission lines including: main parameters computation, determination of propagation equations and characteristic impedance.</p> <p>For various load conditions a java Applet allows the determination of current and voltage distribution and measurement.</p>
--

**Materials characteristics**

<b>Product type*</b> A codes	<b>Language 1</b> (use country codes on p. 2)	<b>Language 2*</b> (use country codes on p. 2)	<b>User profile</b> D, E and F codes	<b>Media / format</b> H codes	<b>Learning environment</b> J codes	<b>Stage of development</b> B codes
A1	EN	PT	D5,D4,E4,E9	H 8	J4	B-4

\*

**Availability**

<b>Date of publication / production</b> September 2001	<b>Available free of charge on request?</b> Yes X <input type="checkbox"/> No <input type="checkbox"/>	<b>If no, state retail price in EUR</b>
<b>Details of supplier</b>		
Name:	Maria J. M. Martins	
Institution:	Instituto Superior Tecnico	
Address:	Avenida Rovisco Pais 1	
Post code:	Town:Lisbon	Country: Portugal
Tel :	+351 21 8419203 Fax: + 351 21 846 4455	E-mail: pcjoaom @ alfa.ist.utl.pt