C O N T E N T S

Background

One of the main motives for creating the network is the very good results from the **TEMPUS S_JEP- 11392 "Restructuring Degree Courses in Computing",** finished in 1999, that united for three years the five Bulgarian departments of Computing and five similar departments in England, Germany, Italy and Greece. **The Coordinator of this Project was the Department of Computing at the University of Rousse**. The organization of the work within this project and mainly the results of the consortium's work were the main reason for electing the project as a **flagship**. The network, created within this project will be used as a model when establishing the new thematic network.

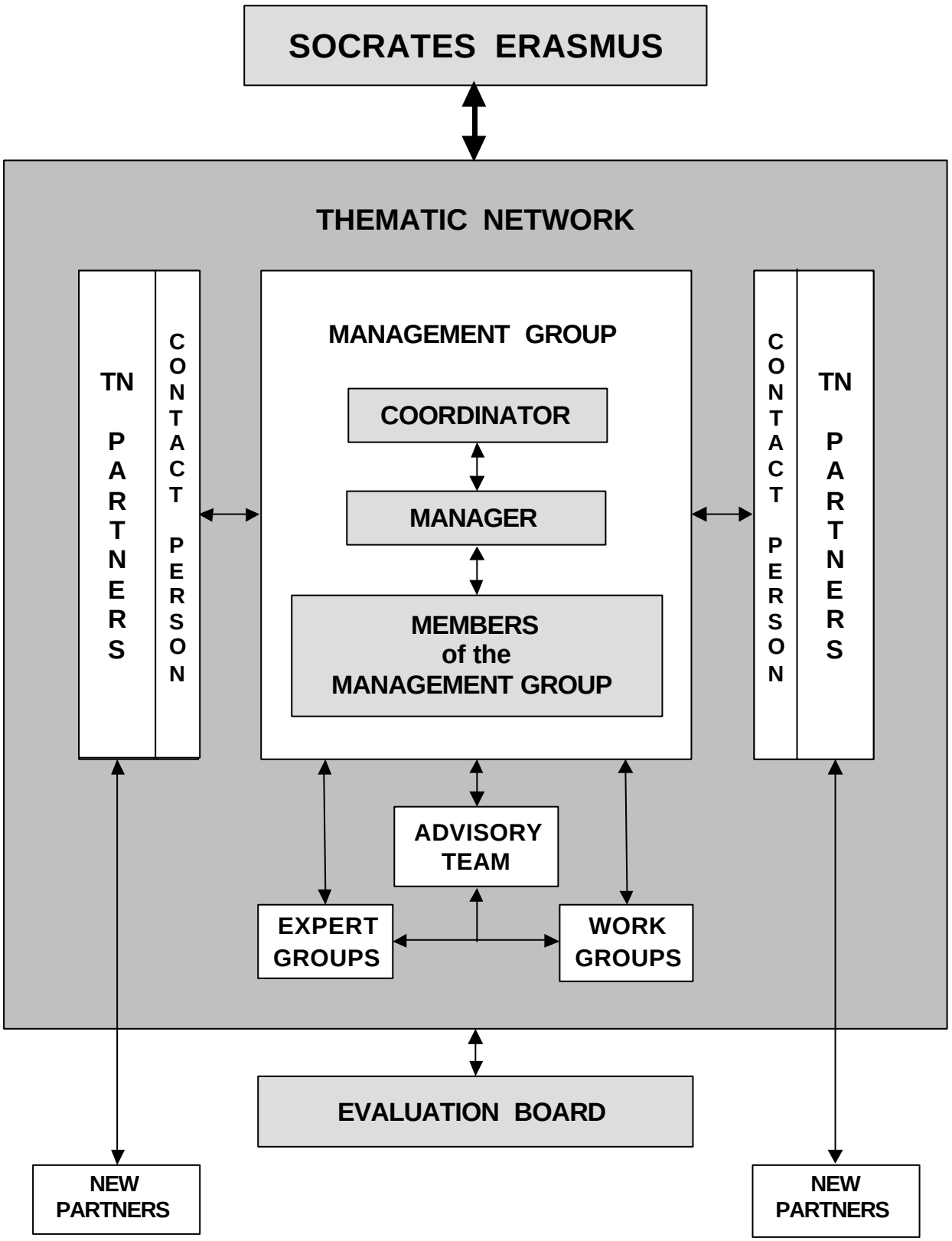
Another major motive comes from the following. According to forecasts by many specialists the 21st century will be an **Information Technology Century**. It is expected that new Information and Communication Technologies will enter absolutely every area of human activity – material as well as mental, which will cause a third industrial revolution. This will lead to the establishment of a new quality of society, which is called **the Information Society**. This society will be based on a continually expanding network of computers with continually improving performance whose infrastructure is the INTERNET. The stability of this platform and of this society will depend mainly on the people who are assigned by the society, the tasks of developing, producing and maintaining its separate components, i.e. on the quality of trained **computer specialists**. Following this logic we inevitably come to the universities and more particularly to **the departments that teach Bachelors and Masters in Computer Science and Engineering (Computing).** Is it possible for the individual departments, using only their own resources and facilities and bearing in mind the current boom in the field of the Information Technologies, to ensure the necessary quality of the final product of their activity? Obviously this would be possible only through the close cooperation of a widely representative commonwealth of **Computing and Information Technologies Departments in Europe**. Therefore, in order to meet the requirements of the Information XXI Century, these departments should integrate their efforts from the very beginning of this century linking in a Thematic Network – **E**UROPEAN **C**OMPUTING **E**DUCATION and **T**RAINING (TN **ECET**), an opportunity given by the SOCRATES-ERASMUS programme. Applying the Information Technologies they must join their efforts in creating a **V**IRTUAL **E**UROPEAN **D**EPARTMENT **o**f **C**OMPUTING (**VEDoC**)**,** which should become a powerful producer of specialists capable of developing the latter technologies according to the constantly rising needs of the Information Society of Europe as a whole.

ECET will be created on a goodwill principle and will be open to all departments, associations, societies and companies from the computer branch willing to join in. It is based on an Academic Society established as a result of the above-mentioned project work. Its main objective is to combine the efforts of lecturers in Computing to improve and maintain the quality of teaching and research at a level determined by European and world standards.

Objectives

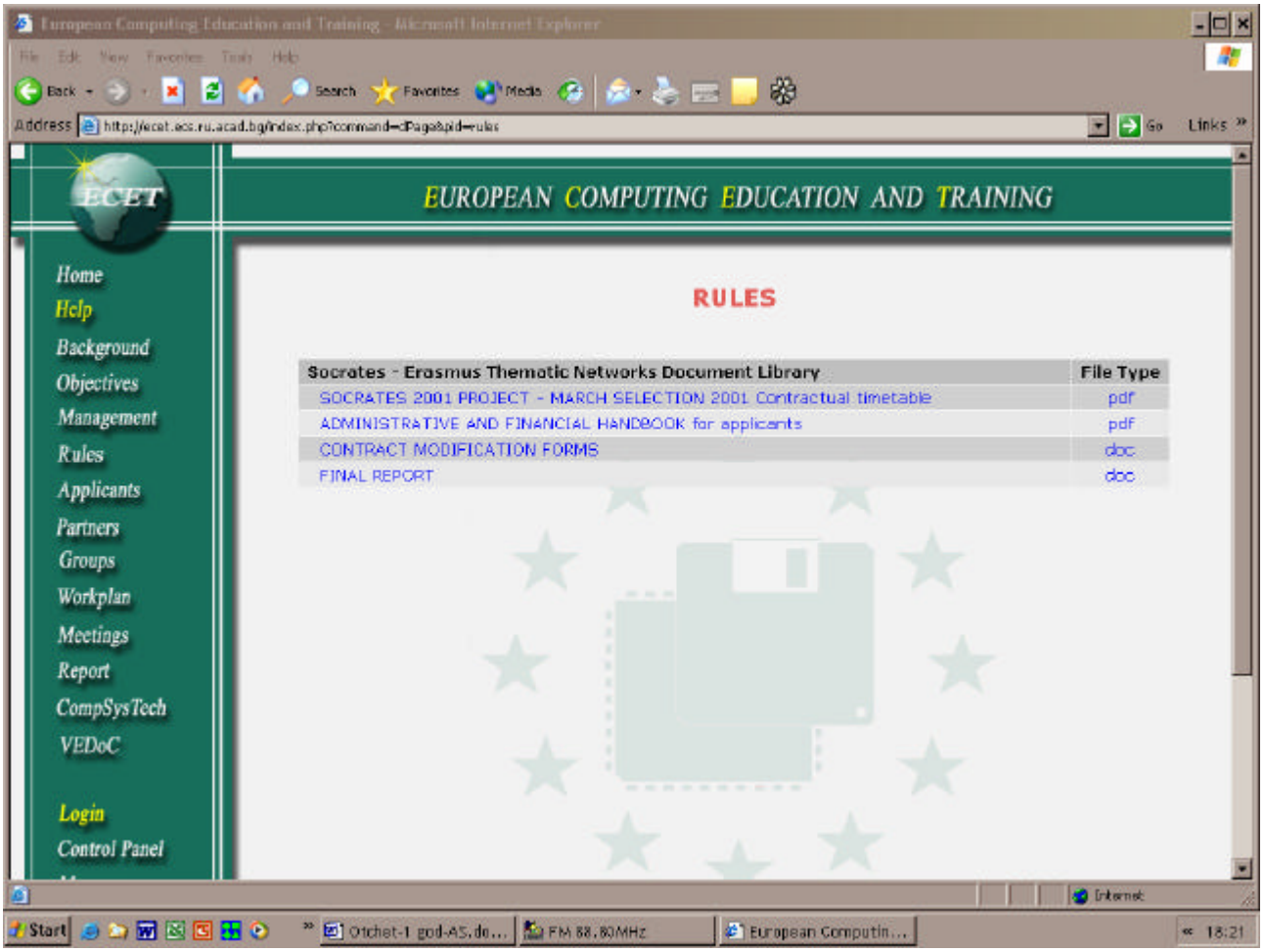
1. Establishing the Thematic Network **E**UROPEAN **C**OMPUTING **E**DUCATION and **T**RAINING (**ECET**) - at the end of the third year the number of departments and organisations included in the network has to reach 150.
2. Establishing a model **V**IRTUAL **E**UROPEAN **D**EPARTMENT of **C**OMPUTING (**VEDoC**).
   2.1. Creation of Virtual Recommended Professional Standards in Computing.
   2.2. Creation of Virtual Recommended Curricula and Syllabi in Computing.
   2.3. Creation of a WEB based Courses in Computing.
   2.4. Creation of a Virtual Library in Computing.
   2.5. Use and development of the **E**uropean **C**redit **T**ransfer **S**ystem (**ECTS**) and the **S**ystem for **Q**uality **C**ontrol (**SQC**).
3. Establishing an EUROPEAN **C**OMPUTER **E**DUCATION **A**SSOCIATION (**ECEA**).
4. Evaluating and disseminating ECET project results.
5. Planning the future activities of ECET.

Management


SOCRATES ERASMUS
THEMATIC NETWORK
TN PARTNERS
CONTACT PERSON
MANAGEMENT GROUP
COORDINATOR
MANAGER
MEMBERS of the MANAGEMENT GROUP
CONTACT PERSON
TN PARTNERS
ADVISORY TEAM
EXPERT GROUPS
WORK GROUPS
EVALUATION BOARD
NEW PARTNERS
NEW PARTNERS

Rules

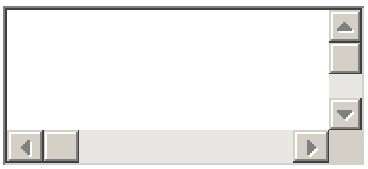
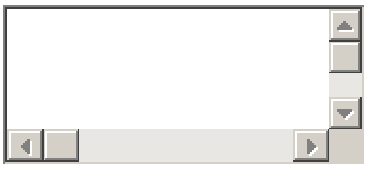
The working rules, to which all Thematic Network members must stick, are formulated by DIRECTORATE-GENERAL EDUCATION AND CULTURE at the EUROPEAN COMMISSION and are published on the project web site.



Applicants

University Departments that teach Bachelors and Masters in Computer Science, Computer Engineering, Software Engineering and Information Systems, as well as companies from the computer branch can join the Thematic Network. Those who wish to join the Thematic Network must fill in and send a New Partners Form and a Letter of intent and after that they should register on the project web site by clicking "Applicants" menu item and filling in the following form. It is desirable that the Applicants are recommended by a TN member.

Connection mode: Standard | Secure	
Country*	-- Select a country --
Institution*	
Department/Unit	
Web site Department/Unit web site	
Address	
Contact person*	
Sex*	Select your sex
Photograph Maximum photo size: 180x250 px Only jpg, gif, pnp and bmp files are allowed	
Position	
Homepage Personal web site	
E-mail*	
Office phone Example: +359 82 450 734	
Home phone	
Cell phone	
Languages Example: English, German	

Taught courses	
Research field	
Hobbies	
Other information	
Motivation	
Username* Alphabetic characters only	
Password* Case sensitive	
Retype password*	
Submit	
Please note that fields marked with * are required!	

Partners

1. Austria
Technical University of Vienna

2. Belgium
BIKIT
University of Ghent
Vartec nv

3. Bulgaria
ACMBUL Bulgarian Chapter of the Association for Computing Machinery
Bulgarian Association of Information Technology
Bulgarian Branch Association of Electronic Industry and Informatics (BBAEII)
Business Innovation Centre-IZOT Co.(BIC-IZOT Co.).
Bulgarian Academy of Sciences - Central Laboratory for Parallel Processing
Defence and Staff College
IEEE Bulgaria Section
Siemens EOOD
Technical University of Sofia
Technical University of Gabrovo
Technical University of Varna
University of Rousse
University of Veliko Turnovo

4. Cyprus
University of Cyprus

5. Denmark
Aalborg University

6. Estonia
Tallinn Technical University

7. Finland
Lappeenranta Technology University
University of Turku

8. France
UVSQ

9. Germany
Comhard Gesellschaft für Computer Kommunikation Bildung mbH
University of Applied Sciences Berlin (FHTW)

10. Greece
University of Ioannina

11. Hungary
University of Szeged

12. Iceland
Reykjavik University

13. Ireland
Dublin City University
National College of Ireland

14. Italy
Pavia University

15. Latvia
Riga Technical University

16. Liechtenstein
University of Applied Sciences Liechtenstein

17. Lithuania
Vytautas Magnus University

18. Luxembourg
University Centre of Luxembourg

19. Malta
University of Malta

20. Norway
Norwegian University of Science and Technology

21. Poland
Warsaw University

22. Portugal
New University of Lisbon
Coimbra University

23. Romania
Academy of Economics Studies Bucharest
University of Pitesti

24. Slovenia
University of Ljubljana
Nova Gorica Polytechnic

25. Spain
Polytechnic of Madrid

26. Sweden
University of Gävle
Växiö University

27. The Czech Republic
University of Ostrava

28. The Netherlands
Eindhoven University of Technology

29. The Slovak Republic
Slovak University of Technology

30. Turkey
Bilkent University
Middle East Technical University

31. UK
Leeds Metropolitan University
Liverpool John Moores University
University of Plymouth
University of Ulster

Groups

Group Name	Group Email
Management Group	mg@ecs.ru.acad.bg
Advisory Team	at@ecs.ru.acad.bg
Evaluation Board	eb@ecs.ru.acad.bg
Expert Groups	
Foundation of Computer Science	egfcs@ecs.ru.acad.bg
Computer Architecture	egca@ecs.ru.acad.bg
Computer Communications & Networks	egccn@ecs.ru.acad.bg
Algorithms, Programming & Software Engineering	egapse@ecs.ru.acad.bg
Data Processing, Data Bases, Information Systems & Human Computer Interaction	egdpdb@ecs.ru.acad.bg
Artificial & Computational Intelligence	egaci@ecs.ru.acad.bg
Project Work & Industrial Placement	egpwip@ecs.ru.acad.bg
Visualisation & Multimedia	egvm@ecs.ru.acad.bg

Working practices of the groups

1. The project manager sends via E-mail to the leaders of each group the tasks which have to be completed.
2. The Group leader distributes these tasks to all group members.
3. The Group leader devises a work plan and sends it to the Manager and to all group members. The group work plan has to be synchronised with the project work plan.
4. The Group leader with the help of the kernel of the group works out a proposal for the comparable Professional Standards (Advisory Team), respectively of the curricula (Expert Groups) and sends them to all other group members.
5. The group members send via E-mail to the Group leader their suggestions for revisions and amendments.
6. The Group leader makes the necessary modifications and sends the new version to the group and to the Project Manager.
7. The Manager publishes the received comparable Professional Standards, respectively curricula in the Forum of the project web site and sends them to all network members in this way opening a virtual meeting to discuss the materials.
8. Suggestions and comments of the network members are considered.
9. The final versions are discussed and adopted at the next work meeting of the Management Group and published on the project web site and in the Project Annual report.

Workplan
for 2001 / 2002

No	Activity	Responsible	Date
1.	Elaborating the TN Workplan for 2001/2002.	Rousse University	15.11.2001
2.	Introducing the Thematic Network (TN) members to each other: • Selecting and elaborating a system for operating communication between TN members; • Creating a WEB site of the TN; • Elaborating a Who is Who directory with the details of all TN members; • Exchange of ECTS information packages.	Rousse University, Contact Persons	 30.11.2001 31.01.2002 28.02.2002 31.03.2002
3.	Studying working practices of existing TN. Creating working practices and terms of reference of the TN ECET.	Rousse University, Contact Persons	15.12.2001
4.	Submitting a proposal for financing the TN in 2002 / 2003.	Rousse University, Contact Persons	28.02.2002
5.	Convening a Meeting of the TN with the purpose of: • Discussing and adopting the working practices and terms of reference; • Discussing and adopting the Workplan for 2001/2002; • Electing a Management group (MG); • Electing an Advisory Team (AT); • Electing Expert groups (EGs); • Electing Evaluation Board (EB).	Rousse University, Contact Persons	31.03.2002
6.	Establishing VIRTUAL EUROPEAN DEPARTMENT of COMPUTING (VEDoC). Creating the infrastructure of the department.	All Partners	31.03.2002
7.	Organising virtual meetings of the Evaluation Board in order to specify the criteria and procedures for evaluating project work results.	EB	30.04.2002
8.	Organising virtual meetings of VEDoc with the purpose of: • Discussing ideas about the virtual library structure; • Discussing ideas about the virtual centre for preparing teaching materials; • Discussing the possibilities for student and lecturer exchange between the TN partners within the Socrates-Erasmus programme.	MG, AT, EGs, EB	 30.04.2002 31.05.2002
9.	Organising virtual meetings of the Advisory Team in order to develop recommended professional standards.	AT	15.06.2002
10.	Organising a round table to discuss the professional standards.	MG, AT, EGs	30.06.2002

11.	Organising virtual meetings of the separate Expert groups with the purpose of: • Analyses of existing curricula; • Developing recommended curricula for Bachelors.	EGs	15.09.2002
12.	Organising a round table to discuss the curricula.	MG, AT, EGs	30.09.2002
13.	Organising a conference on the role of the TN in the development of the information and communication technologies (ICTs) and in the e-Learning initiative of the European commission.	Rousse University, Contact Persons	30.06.2002
14.	Publishing Conference proceedings – both paper and electronic.	Coordinator	31.08.2002
15.	Attracting 30 new members of the TN – about 1-2 of each partnering country.	All Partners	30.09.2002
16.	Informing the public about the project work results by means of regional and national mass media.	All Partners	Continuous
17.	Preparing a report about project work results in the first year.	Rousse University, Contact Persons	15.09.2002
18.	Preparing a Workplan for 2002 / 2003.	Rousse University, Contact Persons	15.09.2002
19.	Convening a MG Meeting with the purpose of: • Discussing and adopting the report; • Evaluating the completed work; • Discussing and adopting the Workplan for 2002 / 2003.	Rousse University, Contact Persons EB	30.09.2002

Meetings

First Meeting

MEETING 1
22.03.2002, 10:00 h.
University of Rousse, floor 2, meeting room
Agenda

- Address of the University of Rousse Rector to the Meeting participants.
- Introduction of the Meeting participants.
- Handing an Award to Mr. Stanley Oldfield – Contractor of TEMPUS S_JEP-11392 “Restructuring Degree Courses in Computing”.
- Presentation by Prof. Dr. Michael O hEigeartaigh about organization and work of the Thematic Network “TN for University / Industry Co-operation in Europe in the Field of Computing”.
- Discussing and adopting a Work plan for 2001/2002.
- Reporting about project progress.
- Studying the application for project renewal in 2002/2003. Discussion.
- Specifying future activities. Discussion.
- Any other business (AOB).

- Taking a photo of all meeting participants in front of the University central entrance.
- Showing around the University central building.

MEETING 2
22.03.2002, 15:00 h.
University of Rousse, floor 2, meeting room
Agenda

- Information about tasks of MG, AT, EGs, WGs, EB.
- Discussing and adopting members of each groups.
- Electing a head for each group.
- Discussing and adopting a technology for developing recommended professional standards and curricula (cooperation and interaction between ?? and EGs).
- Planning round tables for discussing the recommended professional standards and curricula – specifying the time and place of events.
- Discussing project budget and the scheme for distribution and accounting of funds.
- Information about project financial rules.
- AOB.

- Showing around teaching and research labs of the Department of Computer Systems and Technology at the University of Rousse.

MEETING 3
23.03.2002, 10:00 h.
University of Rousse, floor 2, meeting room
Agenda

- Demonstration of the project WEB site.
- Discussing a concept for VIRTUAL EUROPEAN DEPARTMENT of COMPUTING (VEDoC).
- Discussing a concept for a Department Library.
- Discussing a concept for a Centre for developing teaching materials.
- Demonstrating a WEB site of the course on “Computer Organization”.
- Information about preparation of the CompSysTech’2002 conference.
- AOB.

- 4 hour excursion in town and area

MINUTES and MAIN RESULTS of the MEETING held from 22 to 23 March 2002 at the University of Rousse

In this first Meeting **45 representatives of 34 institutions took part, who were partners within the project, from 21 European Countries**, including Germany, Greece, France, Ireland, Portugal, Finland, UK, Island, Liechtenstein, Norway, Bulgaria, Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, Slovak Republic. Most of the representatives of the rest 11 countries could not participate because of urgent commitments, but they were familiarized with the discussed materials in advance and could express their opinion virtually, by using the project WEB site.

The meeting was opened by the Rector of the University of Rousse Prof. DSc Boris Tomov, who welcomed the participants and handed a Certificate for a Honourable member of the University of Rousse to Mr. Stanley Oldfield – Contractor of TEMPUS S_JEP-11392 "Restructuring Degree Courses in Computing". This project was coordinated by the Department of Computing at the University of Rousse and can be considered a predecessor and originator of the Thematic Network 213871-CP-1-2001-1-BG-ERASMUS-TN EUROPEAN COMPUTING EDUCATION AND TRAINING.

After the formal part has finished all participants introduced briefly themselves and their departments and institutions they represent.

Prof. Dr. Michael O hEigeartaigh informed the participants in the meeting about organization and work of the Thematic Network "TN for University / Industry Co-operation in Europe in the Field of Computing" and gave out to everyone materials with detailed information about this network.

The following were discussed and adopted:

- Work plan for 2001/2002;
- The report of the work accomplished up till now;
- List of activities by the end of the first year, namely:
  - Establishing of a VIRTUAL EUROPEAN DEPARTMENT of COMPUTING (VEDoC);
  - Development of a virtual library concept;
  - Development of a concept for a virtual centre for preparing teaching materials;
  - Development of a comparable professional standards;
  - Development of a comparable curricula and syllabi for the Bachelor's degree;
  - Organizing a conference CompSysTech'2002;

- Attracting 30 new members of the TN.

The application for project renewal in 2002/2003 was discussed and adopted.

The tasks of the Management Group, Advisory Team, Expert Groups and Evaluation Boards were discussed and adopted. The members of those groups were approved and groups leader were elected, namely:

- **Management Group** – Assoc. Prof. Angel Smrikarov, BG, University of Rousse
- **Advisory Team** – Prof. Markku Nurminen, Finland, University of Turku
- **Expert Group "Foundation of Computer Science"** – Assoc. Prof. Hugo Oskar, BG, Technical University of Sofia
- **Expert Group "Computer Architecture"** – Assoc. Prof. Alexander Sudnitson, Estonia, Tallinn Technical University
- **Expert Group "Computer Communications & Networks"** – Prof. Virginio Cantoni, Italy, University of Pavia
- **Expert Group "Algorithms, Programming & Software Engineering"** – Prof. Mehdy Jazayeri, Austria, Technical University of Vienna
- **Expert Group "Data Processing, Data Bases, Information Systems & Human Computer Interaction"** – Assoc. Prof. Josef Tvrdik, CZ, University of Ostrava
- **Expert Group "Artificial & Computational Intelligence "** – Prof. Kesheng Wang, Norway, Norwegian University of Science and Technologies
- **Expert Group "Project Work & Industrial Placement"** - Sylvia Alexander, UK, University of Ulster
- **Expert Group "Visualisation & Multimedia"** - Assoc. Prof. Martin Sperka, Slovak Republic, Slovak University of Technology
- **Evaluation Board** – Deborah Trayhurn, UK, Leeds Metropolitan University

A technology for way of functioning of the Advisory Team and Expert Groups was proposed.

Project budget and the scheme for distribution and accounting of funds was adopted as well as project financial rules.

The content of the Partner Agreement with its Annexes, which has to be signed between the Project Contractor Assoc. Prof. Angel Smrikarov and each one of the partners represented by the corresponding contact person, was explained. The Partner Agreement with its Annexes can be found on the project WEB site under Rules. It has to be signed, stamped and returned back to the Contractor by 15/04/2002. Complying with the articles of the Partner Agreement is unconditional and necessary for both sides.

The following was discussed:

- A concept for a VIRTUAL EUROPEAN DEPARTMENT of COMPUTING;
- A concept for a Department Library;
- A concept for a Centre for developing teaching materials;

- A concept for the content of WEB based courses.

It was decided that the next Management Group Meeting will be in the period 19-21 June 2002 in Sofia during the ***CompSysTech'2002*** conference. The Management Group recommends insistently to all departments and partner organisations to take part in the meeting.

Second Meeting

22.06.2002, 10:00 h.
House of Science and Technology
108 Rakovski Street, 1000 Sofia,
floor 2, Hall No 3
Agenda

- Introduction of participants in the meeting.
- Report about completed work. Discussion.
- Discussing the Professional Standards.
- Specifying future activities. Discussion.
- Planning next meetings.
- Clarifying some of the financial rules for project work.
- Any other business.

MINUTES and MAIN RESULTS of the MEETING held from 20 to 22 June 2002 at the House of Science and Technology, Sofia

In this Second Meeting **40 representatives of 18 European countries took part,** including Belgium, Germany, Greece, Spain, France, Ireland, Italy, Finland, UK, Island, Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Poland, Slovenia, Slovak Republic.

All participants in the meeting were present at the CompSysTech'2002 conference, whose organization is included in the work plan of TN ECET for the first year. Prof. Virginio Cantoni and Prof. Jorge Ramio Aguirre presented plenary papers on the topics "The academic tradition and the world of e-Learning" and "CriptoRed: a Thematic Network Oriented Towards a Virtual Community". Most of the rest of the partners participated with papers in the work of the separate sections.

At this meeting a brief report was given about the work completed at that moment, the Professional Standards were discussed and the forthcoming tasks were marked.

Regarding the next meetings it was decided that they would take place as follows:

1. Cyprus, Larnaka – 26-27.07.02
   Objective - adopting the professional standards and working in expert groups to propose courses to be included in the curricula proposals.
2. Austria, Vienna – 16-17.09.02 – Final meeting.
   Objective - to adopt the curricula and final report for the first year.

3. Bulgaria, Varna – 20-21.09.02
   Objective - participation in the international conference SAER'02 and finalising the first project year.

Third Meeting

26-27.07.2002
Larnaka – Cyprus
Agenda

- Introduction of participants in the meeting.
- Discussing and adopting the Professional Standards for Bachelors and Masters in:
  - Computer Science
  - Computer Engineering
  - Software Engineering.
- Discussing the list of subjects (disciplines, modules), which will be included in the curricula for Bachelors and Masters in:
  - Computer Science
  - Computer Engineering
  - Software Engineering.
- Planning the final meeting.
- Clarifying some of the financial rules for project work.
- Any other business.

MINUTES and MAIN RESULTS of the MEETING held from 26 to 30 July 2002 in Larnaka, Cyprus

In this Third Meeting **26 representatives of 15 institutions of 10 European countries** took part, including Germany, Spain, France, Finland, Bulgaria, Czech Republic, Poland, Cyprus, Romania, Slovak Republic. Most of the representatives of the rest of the countries could not participate because of urgent commitments and limited mobility funding, but they were familiarized with the discussed materials in advance and could express their opinion virtually, by using the project WEB site.

The professional standards were discussed at the sessions conducted on 26 and 27 July.

On 29 and 30 July the separate expert groups worked in parallel. The objective of their discussions was to prepare the list of courses, which will be included in the curricula for Bachelors.

Regarding the next meetings it was decided that they would take place as follows:

1. Austria, Vienna – 16-17.09.02 – Final meeting.
   Objective - to adopt the curricula and final report for the first year.
2. Bulgaria, Varna – 20-21.09.02
   Objective - participation in the international conference SAER'02 and finalising the first project year.

All the participants were familiarized again in deep details with the financial rules of the SOCRATES programme. Detailed clarifications were given how to fill in the separate financial documents and appendices to the Partner Agreement.

Fourth Meeting

MEETING 1
16.09.2002, 10:00 h.
Vienna University of Technology
Karlsplatz 13, 1st floor, Böcklsaal, 1040 Vienna
Agenda

- Address of the Professor Mehdi Jazayeri to the participants in the meeting.
- Introducing the participants in the meeting.
- Reporting about project progress.
- Listening to the opinion of the Leader of the Evaluation Board.
- Discussion.
- Adopting the Curricula for Bachelors in CS, CE, SE, IS.
- Specifying the activities until the end of the first year.
- Discussion.
- Others.

MEETING 2
16.09.2002, 15:00 h.
Vienna University of Technology
Karlsplatz 13, 1st floor, Böcklsaal, 1040 Vienna
Agenda

- Information about project financial rules.
- Preparation of financial documents.
- Others.

MEETING 3
17.09.2002, 10:00 h.
Vienna University of Technology
Karlsplatz 13, 1st floor, Böcklsaal, 1040 Vienna
Agenda

- Demonstration of the ECET WEB site.
- Demonstration of the VEDoC WEB site.
- Demonstration of the Virtual Centre for Preparing WEB based Courses (eLearning Shell).
- Making a decision about establishing a VEDoC.
- Discussing and adopting a project for Work plan for 2002 / 2003.
- Others.

MEETING 4
17.09.2002, 15:00 h.
Vienna University of Technology
Karlsplatz 13, 1st floor, Böcklsaal, 1040 Vienna
Agenda

- Preparation of financial documents.
- Others.

MINUTES and MAIN RESULTS of the MEETING held from 26 to 30 July 2002 in Vienna University of Technology

In the Final Meeting **57 representatives from 41 institutions of 24 European countries** took part, including Belgium, Denmark, Germany, Greece, Spain, Ireland, Italy, Austria, Portugal, Finland, Sweden, UK, Island, Lichtenstein, Bulgaria, Czech Republic, Cyprus, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, Slovak Republic.

The meeting was opened by Professor Mehdi Jazayeri, who welcomed the participants.

After the formal part has finished all participants introduced briefly themselves and their departments and institutions they represented.

The meeting was split in several sessions.
During the first session the following issues were discussed and adopted:

- Reporting about project progress. The information was presented by the Project Coordinator Prof. Angel Smrikarov.

- Listening to the opinion of the Leader of the Evaluation Board Mrs. Deborah Trayhurn.

- Discussions took place on the coordinator's report as well as on the opinion of the Leader of the Evaluation Board.
- Adopting the Curricula for Bachelors in Computer Science, in Computer Engineering, in Software Engineering and in Information Systems.
- Specifying the activities until the end of the first year.
- Discussion.

During the second session mainly financial issues were discussed. The project manager reminded about the main project financial rules and the way of preparation of financial documents. A decision was made that by 10/10/2002 each partner has to send filled in financial appendices by email for check, and by 20/10/2002 – the final report by registered mail.

In addition Expert group meetings took place, at which the activities of the groups for the second year were discussed and specified.

On 17/09/02 the sessions continued with a demonstration of the ECET WEB site, demonstration of the VIRTUAL EUROPEAN DEPARTMENT of COMPUTING (VEDoC) WEB site, demonstration of the Virtual Centre for Preparing WEB based Courses (e-Learning Shell) and of the Virtual Library.

A decision was made to establish a VEDoC. The coordination of this department was assigned to the department of Computing at the University of Rousse.

A proposal for a Work plan for year 2002 / 2003 was discussed and adopted.

Report
for 2001 / 2002

1. A detailed WORKPLAN for 2001/2002 has been worked out.
2. A regular contact with the network partners and the SOCRATES Head Office in Brussels and Sofia has been established and maintained – the Manager and the network members have exchanged up to 60-70 e-mail messages daily at crucial moments.
3. A WEB site of TN has been created. The Web site contains information about: TN background, objectives, partners, work groups (management groups, advisory team, evaluation board, different expert groups), management structure, a library with Socrates/Erasmus documents concerning finances, applicants and final reports, work plan, meetings, conferences, reports, etc. For each work group there is a complete list of members and also a collective mailing list for sending emails to all members. After login the TN partners have access to the Project Forum, where they can give their comments and opinion on the project documents currently under discussion. New applicants can fill in an electronic application on-line, which later can be approved or disapproved by the TN coordinator or manager.
4. An electronic guidebook "Who is Who" has been created, with data about all TN members. This is maintained on the TN Web site and can be accessed by everyone.
5. ECTS information packages have been exchanged between partners and a model ECTS information package has been created.
6. Working practices of existing TN has been studied.
7. Working practices and terms of reference of the TN ECET have been elaborated, discussed and adopted.
8. A proposal for financing the Network during 2002/2003 have been written and sent to the Socrates Office in Brussels.
9. The management infrastructure of TN has been developed
10. The first meeting of the TN ECET has been convened at the University of Rousse, Bulgaria. 45 representatives of 34 institutions took part. The following activities have been completed at the meeting:
    - The working practices and terms of reference have been discussed and adopted;
    - The work plan for 2001/2002 has been discussed and adopted;
    - A Management group has been elected;
    - An Advisory Team has been formed;
    - Expert groups have been formed;
    - An Evaluation Board has elected;
    - A vision of a Virtual European Department of Computing has been proposed and discussed.
11. Partner agreement Contract between the Coordinator and the TN member-organizations have been worked out and signed.
12. A Virtual centre for developing WEB based courses (software e-Learning platform) have been developed, which is being tested at the moment at the University of Rousse and the COMHARD Company, Berlin.
13. A model of a WEB site of a course has been created.

14. Work is being done on the creation of a model virtual laboratory.
15. CompSysTech'2002 conference has been conducted with the wide participation of members of the TN consortium. 68 out of 105 papers were presented by representatives of TN partner institutions. There was a special "e-Learning" section dedicated on the role of the TN in the development of the information and communication technologies (ICTs) and in the e-Learning initiative of the European commission.
16. CompSysTech'2002 conference proceedings have been published in a paper version and a CD.
17. The Second TN project meeting took place in Sofia during the CompSysTech conference. 40 representatives of 18 European countries took part. The following activities have been completed at the meeting:
    - Report about completed work.
    - Discussing the Professional Standards for Bachelors and Masters in Computer Science, Computer Engineering and Software Engineering.
    - Specifying future activities.
    - Clarifying some of the financial rules for project work.
18. Email and Web Forum discussions have been conducted between members of the Advisory team in order to develop comparable professional standards.
19. Comparable professional standards for Bachelors and Masters in Computer Science (CS), Computer Engineering (CE), Software Engineering (SE) and Information Systems (IS) have been elaborated.
20. The third TN ECET project meeting took place in Larnaka, Cyprus, and has been hosted by the University of Cyprus. Its main objective was to discuss and adopt the Professional standards.
21. Virtual meetings and email discussion have been conducted between members of the Expert groups with the purpose of discussing existing curricula and preparing lists of courses to be included in the comparable curricula.
22. Meetings of the Expert groups took place in Larnaka in order to discuss and prepare lists of courses to be included in the comparable curricula.
23. Comparable curricula for Bachelors in CS, CE, SE and IS have been prepared.
24. About 12 new TN members have been attracted.
25. The government and the public in Bulgaria have been acquainted with the goals and the tasks of TN.
26. The objectives and outcomes of the TN ECET in the first year were presented at the East-West Vision (EWV02) conference, which took place on 12-13 September, 2002 in Graz, Austria.
27. A report about the work done in the first project year has been elaborated.
28. A Workplan for year 2002 / 2003 has been prepared.
29. The final meeting for the first project year has been organised. It was hosted by the Vienna University of Technology and took place in Vienna on 15-18 September. The following activities have been completed at the meeting:
    - The comparable curricula for Bachelors in CS, CE, SE and IS have been discussed and adopted;
    - The first year report has been discussed and adopted;
    - The work completed in the first project year has been evaluated;
    - ?he Workplan for 2002 / 2003 has been discussed and adopted.

30. SAER-2002 conference has been conducted. A total of 18 papers were presented by representatives of the TN. During the conference a round table round table on Computing education has been conducted.
31. The Project Coordinator was invited to present a paper at the conference, organised by the Bulgarian Socrates Agency on the occasion of the one millionth SOCRATES student.

A N N E X 1

Comparable Professional Standards

Professional Standards of a Bachelor in Computer Science

1. General characteristics of computer science graduates

"Computer Science (CS) experts of high quality able to handle the increasing demands imposed upon computer-based systems by scientific, technological and commercial development in the new millennium" would be an apt description for CS graduates. We expect that they will be in high demand in every sort of company and enterprise dependent on computer technology.

Degree programmes in CS can take various forms, each of which could prepare students for different, but valid careers. At one extreme, a degree programme might provide opportunities for students to take courses on a wide range of topics spanning the entire area of CS. At another extreme, a programme might take one specific aspect of CS and cover it in greater depth. The objective of this programme is to prepare students either for postgraduate study or for immediate employment, and achievement of professional excellence in the high technology industries, which interface with the information processing systems that they study. The graduates from such programmes would typically tend to seek opportunities in the areas of industry, education, the public and private sectors, banking, transport, healthcare, ecology, etc. The bachelors of CS would have a basic knowledge of economics, management and marketing. They would be able to design, develop, implement, support, extend, adapt and localize computer and information technologies (C&IT).

Computer Science graduates would develop a high-level understanding of systems as a whole, would understand not only the theoretical underpinning of the discipline but also how this theory influences practice, would possess a solid foundation that allows them to maintain their skills and knowledge as the field of CS evolves.

The curriculum covers the essential practical techniques, together with the deeper principles, which they are based upon. Students are expected to develop a wide range of knowledge and skills. These may be divided in three broad categories: theoretical knowledge, practical skills and additional skills.

2. Common skills

The Computer Science graduates would obtain expertise to:

- demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to CS;
- use such knowledge and understanding in the design of computer-based systems in a way that demonstrates comprehension of the tradeoff involved in design choices;
- identify and analyze criteria and specifications appropriate to specific problems;
- deploy appropriate theory, practices, and tools for the specification, design, implementation and evaluation of C&IT.

3. Practical skills

The Computer Science graduates would acquire abilities to:

- work with office applications;
- specify, design, and implement software systems;
- evaluate systems in terms of general quality attributes;
- apply the principles of effective information management to information of various kinds of sources, such as textbooks, lecture notes, Internet;
- apply the principles of advanced human-computer interaction techniques to the design and implementation of a wide range of C&IT;
- deploy effectively the tools used for the construction and documentation of software;
- operate computer hardware and software systems effectively and efficiently.

4. Additional skills

These skills are not concerned with specific computer-related field of study. Instead, they are meant to satisfy general student interests in computing. They would be acquired throughout the whole course of study. These skills include the ability to:

- make succinct presentations to a range of audiences about technical problems and their solutions;
- work effectively as a member of a development team;
- understand and explain the quantitative dimensions of a problem;
- manage one's own learning and development, including time management and organizational skills;
- keep abreast of current developments in the discipline to continue one's own professional development;
- understand the fundamentals of Market Economy and Business Management.

5. CS Body of Knowledge

The CS graduates' education is based on:

- Fundamental training that includes studies in the following areas:
  - Mathematics
  - Programming Fundamentals
  - Discrete Structures
  - Principles of Management
  - Social & Professional Issues
- Specialized training that includes studies in the following areas:
  - Algorithms & Complexity
  - Computer Graphics
  - Software Engineering
  - Programming Languages & Methodologies
  - Databases and Information Systems
  - Operating Systems
  - Computer Architecture

- Computer Networks
- Computer Security
- Human-Computer Interaction
- Artificial Intelligence
- Internet Technologies

CS graduates are expected to be highly qualified and motivated, with in-depth knowledge and understanding of C&IT. They may be expected to take up positions such as, but not limited to: system developers of computer based systems, system programmers, system analysts, project managers.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Professional Standards of a Master in Computer Science

1. General characteristics of MSc in Computer Science

The professional suitability of a Master in Computer Science (CS) is to carry out investigations; to design, assemble and utilize; to perform manufacturing, technological, company and service activities; to do research and to teach in the field of Computing in view of their application in industry, science, education, the public and private sectors, banking, transport, health care, environment protection, etc. An MSc in CS should possess professional expertise.

In order to develop a firm understanding of the scientific approach, students must have direct hands-on experience with hypothesis formulation, experimental design, hypothesis testing and data analysis. Student must develop an understanding of the scientific method and experience this mode of inquiry in courses that provide some exposure to laboratory work. They may acquire their scientific perspective in a variety of domains, depending on programme objectives and their area of interest.

2. Common skills

Upon graduation, the MSc in CS should have the following most common skills to:

- identify and present his/her own solutions to problems in the field of Computer and Information Technologies (C&IT);
- apply creatively in practice the acquired knowledge;
- critically analyze and apply a range of concepts, principles and practices of the subject in the context of loosely specified problems, showing effective judgement in the selection and use of tool and techniques;
- adopt a complex technical and economical approach and use modern methods and tools when solving an assigned task.

3. Specific skills

Upon graduation, the MSc in CS should also possess the following more specific skills to:

- create, develop and maintain modern software applications for standard and specialised computer equipment;
- expand the functional capabilities of the software of modern computer systems;
- develop, adapt and implement modern computer technologies in different fields of application - industry, science, trade, education, banking, etc.;
- demonstrate a sound understanding of the main areas of the body of knowledge and the theory of CS, with an ability to exercise critical judgement across a range of issues;
- produce work involving problem identification, user requirements specification, analysis, design and development of a software application, along with appropriate documentation. The work must show a range of problem solving and evaluation skills, draw upon supporting evidence, and demonstrate a good understanding of the need for quality.

4. Additional skills

These skills are not concerned with specific computer-related field of study. Instead, they are meant to satisfy general student interests in computing. They would be acquired throughout the whole course of study. These skills include the ability to:

- demonstrate the ability to work as an individual with minimum guidance and as either a leader or member of a team;
- follow appropriate practices within a professional, legal and ethical framework;
- identify mechanisms for continuing professional development and life-long learning;
- explain a wide range of applications based upon the body of knowledge.

5. CS Body of Knowledge

The CS Master's education is based on training in the following areas with in-depth studies in at least one of them:

- Advanced Mathematics for CS
- Modern Methods in Software Engineering
- Parallel Programming
- Distributed Systems
- Advanced Databases
- Advanced Intelligent Systems
- Modelling and Simulations
- Advanced Internet Technologies
- Multimedia Systems and Technologies
- Vision and Imaging

Research and Master's Thesis in accordance with the student's own interests, abilities and development perspectives in the areas of specialized training.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Professional Standards of a Bachelor in Computer Engineering

1. General characteristics of computer engineering graduates

Computer engineers and designers are the architects and implementers of the most up-to-date information and communication technologies and are in great demand throughout industry, commerce and the public sector. The aim of the Computer Engineering (CE) curriculum is to produce well-educated, imaginative and professionally trained engineers and designers who can meet the challenges of the rapid technological development.

Degree programmes in CE can take various forms, each of which could prepare students for different, but valid careers. At one extreme, a degree programme might provide opportunities for students to take courses on a wide range of topics spanning the entire area of CE. At another extreme, a programme might take one specific aspect of CE and cover it in greater depth. The objective of this programme is to prepare students either for postgraduate study or for immediate employment, and achievement of professional excellence in the high technology industries, which interface with the computer systems that they study. The graduates from such programmes would typically tend to seek opportunities in the areas of the electronic and computer industries, the public and private sectors, banking, transport, healthcare, the media, etc. The bachelors of computer engineering would have a basic knowledge of economics, management and marketing. They would be able to design, develop, implement, support, extend, adapt and localize computer systems, but would also have strong software skills.

CE graduates would develop a high-level understanding of systems as a whole, would understand not only the theoretical underpinning of the discipline but also how this theory influences practice, would possess a solid foundation that allows them to maintain their skills and knowledge as the field of CE evolves.

The curriculum covers the essential practical techniques, together with the deeper principles, which they are based upon. Students are expected to develop a wide range of knowledge and skills. These may be divided in three broad categories: theoretical knowledge, practical skills and additional skills.

2. Common skills

The CE graduates would obtain expertise to:

- demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to CE;
- use such knowledge and understanding in the design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices;
- identify and analyse criteria and specifications appropriate to specific problems;
- deploy appropriate theory, practices, and tools for the specification, design, implementation and evaluation of computer systems.

3. Practical skills

The Computer Engineering graduates would acquire abilities to:

- specify, design, and implement computer systems;
- evaluate systems in terms of general quality attributes;
- apply the principles of advanced communication technologies to the design and implementation of a wide range of CE;
- integrate computer and communication technologies for the development of hardware for mobile computing;
- deploy effectively the tools used for the construction and documentation of hardware and system software;
- apply the principles of effective information management to information of various kinds of sources, such as textbooks, lecture notes, Internet;
- operate computer hardware and software systems effectively and efficiently.

4. Additional skills

These skills are not concerned with specific computer-related field of study. Instead, they are meant to satisfy general student interests in computing. They would be acquired throughout the whole course of study. These skills include the ability to:

- make succinct presentations to a range of audiences about technical problems and their solutions;
- work effectively as a member of a development team;
- understand and explain the quantitative dimensions of a problem;
- keep abreast of current developments in the discipline to continue one's own professional development;
- manage one's own learning and development, including time management and organizational skills;
- understand the fundamentals of Market Economy and Business Management.

5. CE Body of Knowledge

The CE graduates' education is based on:

- Fundamental training that includes studies in the following areas:
  - Mathematics
  - Physics
  - Electrical Engineering
  - Circuits and Systems
  - Programming Fundamentals
  - Discrete Structures
  - Principles of Management
  - Social & Professional Issues
- Specialized training that includes studies in the following areas:
  - Algorithms & Complexity
  - Computer Graphics and Human-Computer Interaction
  - Software Engineering

- Computer Organization
- Computer Architecture
- Computer Networks
- Testing and Fault Tolerance
- Operating Systems
- Embedded Systems
- DBMS
- VLSI Design
- Intelligent Systems

CE graduates are expected to be highly qualified and motivated, with in-depth engineering knowledge and understanding. They may be expected to take up positions such as, but not limited to: computer system designers, system programmers, network programmers, network administrators, operations managers.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Professional Standards of a Master in Computer Engineering

1. General characteristics of MSc in Computer Engineering

The professional suitability of a Master in Computer Engineering (CE) is to carry out investigations; to design, assemble and utilize; to perform manufacturing, technological, company and service activities; to do research and to teach in the field of Computing in view of their application in industry, science, education, the public and private sectors, banking, transport, health care, environment protection, etc. An MSc in CE should possess professional expertise.

In order to develop a firm understanding of the scientific approach, students must have direct hands-on experience with hypothesis formulation, experimental design, hypothesis testing and data analysis. Student must develop an understanding of the scientific method and experience this mode of inquiry in courses that provide some exposure to laboratory work. They may acquire their scientific perspective in a variety of domains, depending on programme objectives and their area of interest.

2. Common skills

Upon graduation, the MSc in CE should have the following most common skills to:

- identify and present his/her own solutions to problems in the field of CE;
- apply creatively in practice the acquired knowledge;
- critically analyze and apply a range of concepts, principles and practices of the subject in the context of loosely specified problems, showing effective judgement in the selection and use of tool and techniques;
- adopt a complex technical and economical approach and use modern methods and tools when solving an assigned engineering task.

3. Specific skills

Upon graduation, the MSc in CE should also possess the following more specific skills to:

- create, develop and maintain modern microprocessor and computer systems;
- develop and adapt up-to-date system and application software for standard and specialised computer equipment;
- expand the functional capabilities of the hardware and software of modern computer systems;
- develop, adapt and implement modern computer technologies in different fields of application - industry, science, trade, education, banking, etc.;
- produce work involving problem identification, user requirements specification, analysis, design and development of a computer system, along with appropriate documentation. The work must show a range of problem solving and evaluation skills, draw upon supporting evidence, and demonstrate a good understanding of the need for quality.

4. Additional skills

These skills are not concerned with specific computer-related field of study. Instead, they are meant to satisfy general student interests in computing. They would be acquired throughout the whole course of study. These skills include the ability to:

- demonstrate the ability to work as a leader of a team;
- follow appropriate practices within a professional, legal and ethical framework;
- identify mechanisms for continuing professional development and life-long learning;
- explain a wide range of applications based upon the body of knowledge.

5. CE Body of Knowledge

The CE Master's education is based on training in the following areas with in-depth studies in at least one of them:

- Advanced Mathematics for CE
- Advanced Computer Systems Development
- High Performance Computer Architecture
- Advanced Computer Networks
- Advanced Testing and Verification Technology
- On-line & Real Time Processing
- Distributed Systems
- Modelling and Simulation
- Adaptive Intelligent Systems
- Internet Technologies
- Human Aspects in Computer Systems Design

Research and Master's Thesis in accordance with the student's own interests, abilities and development perspectives in the areas of specialized training.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Professional Standards of a Bachelor in Software Engineering

1. General characteristics of software engineering graduates

Software Engineering (SE) graduates should be high quality experts that are able to handle all aspects of modern software industry in the current setting of increasing demands. We expect the demand for high quality professionals to remain high in the forthcoming years.

SE degree programs can take various forms, each of which could prepare students for different, but valid careers. At one extreme, a degree program might provide opportunities for students to take courses on a wide range of topics spanning the entire area of software engineering. At another extreme, a program might have a specific emphasis on certain aspect of SE and cover it in greater depth. The objective of this program is to prepare students for Master of Science as well as postgraduate studies but also for immediate employment, and achievement of professional excellence in the high technology industries. The graduates from such bachelor programmes would typically tend to seek work opportunities in the areas of (software) industry, education, the public and private sectors, banking, healthcare, etc. Besides core SE skills, the bachelors in SE would have basic knowledge of economics, management, project working and marketing. They would be able to design, develop, implement, support, extend, adapt and localize computer and information technologies (C&IT).

SE graduates need to develop a high-level understanding of systems as a whole, have a good understanding of SE related theory and how this theory influences practice, possess a solid foundation that allows them to maintain their skills and knowledge as the field of SE evolves. For SE graduates it is especially important to develop a wide range of practical skill but to also understand that working in SE field requires one to constantly update one's knowledge and practical skills.

The curriculum covers the essential practical techniques, together with the deeper principles, which they are based upon. Students are expected to develop a wide range of knowledge and skills. These may be divided in three broad categories: theoretical knowledge, practical skills and additional skills.

2. Common skills

Software engineering graduates need to obtain expertise to:

- demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to computer science and especially to software engineering;
- use such knowledge and understanding in the design of computer-based systems in a way that demonstrates comprehension of the tradeoff involved in design choices;
- identify and analyze criteria and specifications appropriate to specific problems; and
- deploy appropriate theory, practices, and tools for the specification, design, implementation and evaluation of C&IT.

3. Practical skills

Software engineering graduates need to acquire abilities to:

- specify, design, and implement software systems;
- work in software projects;
- evaluate (software) systems in terms of general (software) quality attributes;
- gather and apply new information from various kinds of sources, such as textbooks, lecture notes, Internet;
- apply and understand the principles and role of modern software interfaces (human-computer interaction, network techniques, etc) in the design and implementation of systems having software as part of them;
- deploy effectively the tools used for the construction and documentation of software;
- operate computer hardware and software systems effectively and efficiently.

4. Additional skills

These skills are not concerned with specific computer-related field of study. Instead, they are meant to satisfy general student interests in computing. They would be acquired throughout the whole course of study. These skills include the ability to:

- make succinct presentations to a range of audiences about technical problems and their solutions;
- work effectively as a member of a development team;
- understand and explain the quantitative dimensions of a problem;
- manage one's own learning and development, incl. time management and organizational skills;
- keep abreast of current developments in the discipline to continue one's own professional development.

5. SE Body of Knowledge

The SE graduates' education is based on:

- Fundamental training that includes studies in the following areas:
  - Mathematics
  - Programming Fundamentals
  - Discrete Structures
  - Principles of Management
  - Social & Professional Issues
- Specialized training that includes studies in the following areas:
  - Algorithms, Data Structures & Complexity Analysis
  - Computer Science Fundamentals
    - Computer Architecture
    - Operating Systems
    - Computer Networks
    - Databases
  - Software Development

- Software Component Technologies
- Software Architectures
- Software Quality, Testing & Safety
- Programming Languages
- Human Computer Interaction
- Internet Technologies

SE graduates are expected to be highly qualified and motivated, with in-depth knowledge and understanding of C&IT related to software engineering. They may be expected to take up positions such as, but not limited to: software developers, system programmers, software project managers, system analysts.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Professional Standards of a Master in Software Engineering

1. General characteristics of MSc in Software Engineering

An MSc in Software Engineering (SE) needs to able to carry out investigations; to design, assemble and utilize; to perform manufacturing, technological, company and service activities; to do small scale research and teaching in the SE field of computer science in view of their application in industry, science, education, the public and private sectors, banking, healthcare, etc. An MSc should possess professional expertise.

In order to develop a firm understanding of the scientific approach, students must have direct hands-on experience with hypothesis formulation, experimental design, hypothesis testing and data analysis. Student must develop an understanding of the scientific method and experience this mode of inquiry in courses that provide some exposure to laboratory work. They may acquire their scientific perspective in a variety of domains, depending on program objectives and their area of interest.

2. Common skills

Upon graduation, the MSc in SE should have the following common skills to:

- invent and present his/her own solutions to SE problems;
- apply creatively in practice the acquired knowledge;
- critically analyze and apply a range of concepts, principles and practices of the subject in the context of loosely specified problems, showing effective judgement in the selection and use of tools and techniques;
- adopt a complex technical and economical approach and use modern methods and tools when solving an assigned software engineering task.

3. Specific skills

Upon graduation, the MSc in SE should also possess the following more specific skills to:

- design, create, develop and maintain modern software applications for standard and specialised computer equipment;
- expand the functional capabilities of the software of modern computer systems;
- develop, adapt and implement modern computer technologies in different fields of application - industry, science, trade, education, banking, etc.;
- demonstrate a sound understanding of the main areas of the body of knowledge and the theory of SE, with an ability to exercise critical judgement across a range of issues;
- produce work involving problem identification, analysis, design and development of a software application, along with appropriate documentation. The work must show a range of problem solving and evaluation skills, draw upon supporting evidence, and demonstrate a good understanding of the need for quality.

4. Additional skills

These skills are not concerned with specific computer-related fields of study. Instead, they are meant to satisfy general student interests in computing. They would be acquired throughout the whole course of study. These skills include the following abilities:

- demonstrate the ability to work as an individual with minimum guidance and as a leader and as a member of a software team;
- follow appropriate practices within a professional, legal and ethical framework;
- identify mechanisms for continuing professional development and life-long learning;
- understand a wide range of applications based upon the body of knowledge.

5. SE Body of Knowledge

The SE Master's education is based on training in the following areas with in-depth studies in at least one of them:

- Advanced Mathematics for SE
- Advanced Data Structures and Algorithms
- Advanced Software Architectures
- Advanced Issues in Software Design and Development
- Advanced Testing & Verification Technology
- Distributed Systems & Computational Models
- Modelling & Simulation
- Embedded Systems & Real-Time Programming
- Internet Technologies & Multimedia
- Parallel Architectures & Programming

Research and Master's Thesis in accordance with the student's own interests, abilities and development perspectives in the areas of specialized training.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Professional Standards of a Bachelor in Information Systems

1. General characteristics of information systems graduates

Computer-based information systems have become a critical part of the products, services, and management of organizations. The effective and efficient use of information technology is an important element in achieving competitive advantage for business organizations and excellence in service for government and non-profit organizations. The information technology/information system strategy is an integral part of organizational strategy. The support role of information systems extends to all organizational activity at all levels. Contemporary information systems more and more often cross the boundaries between organizations as well as between organizations and their customers/clients.

Information systems, as an academic field, encompasses two broad areas: (1) acquisition, deployment, and management of information technology resources and services (the information systems function) and (2) development and evolution of infrastructure and systems for use in organization processes (system development).

The information systems function has a broad responsibility to develop, implement, and manage an infrastructure of information technology (computers and communications), data (both internal and external), and organization-wide systems. It has the responsibility to track new information technology and assist in incorporating it into the organization's strategy, planning, and practices. The function also supports departmental and individual information technology systems.

The activity of developing systems for organization and inter-organization processes involves creative use of information technology for data acquisition, communication, coordination, analysis, and decision support. There are methods, techniques, technology, and methodologies for this activity. Creating systems in organizations includes issues of innovation, quality, human-machine systems, human-machine interfaces, socio-technical design, and change management.

The objective of this programme is to prepare students either for postgraduate study or for immediate employment, and achievement of professional excellence in the organisations that either deploy or develop information systems. The organisations can be in the public or private sector, they may supply material products or services. The bachelors of IS would have a good knowledge of human activity in organisations and its management. They would have the ability for acquisition, deployment, and management as well as for development and evolution of information systems (IS).

Information systems graduates would develop a high-level understanding of systems as a whole, would understand not only the theoretical underpinning of the discipline but also how this theory influences practice, would possess a solid foundation that allows them to maintain their skills and knowledge as the field of IS evolves.

The curriculum covers the essential practical techniques, together with the deeper principles, which they are based upon. Students are expected to develop a wide range of knowledge and skills. These may be divided in three broad categories: theoretical knowledge, practical skills and additional skills.

2. Common skills

The Information systems graduates would obtain expertise to:

- demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to IS as well as of the spectrum of its reference disciplines;
- use such knowledge and understanding in the design and deployment of computer-based systems in a way that demonstrates comprehension of different tradeoffs involved in design and deployment choices;
- identify and analyze multiple criteria for the problems in the deployment and design of information systems;
- deploy appropriate theories, practices, and tools for the specification, design, implementation, deployment and evaluation of IS.

3. Practical skills

The Information systems graduates would acquire abilities to:

- work with office applications;
- specify, design, and implement software systems;
- observe human activity and interview people;
- evaluate systems in terms of various quality attributes;
- apply the principles of effective information management to information of various kinds of sources, such as textbooks, lecture notes, Internet;
- apply the principles of advanced human-computer interaction techniques to the design and implementation of a wide range of IS;
- deploy effectively the tools used for the construction and documentation of IS;
- operate computer hardware and software systems effectively and efficiently.

4. Additional skills

These skills are not concerned with specific IS-related field of study. Instead, they are meant to satisfy general student interests in computing. They would be acquired throughout the whole course of study. These skills include the ability to:

- make succinct presentations to a range of audiences about IS problems and their solutions;
- work effectively as a member of a team;
- understand and explain the qualitative and quantitative dimensions of a problem;
- manage one's own learning and development, including time management and organizational skills;
- keep abreast of current developments in the discipline to continue one's own professional development;

5. IS Body of Knowledge

The IS graduates' education is based on:

- Fundamental training
  - Mathematics
  - Programming Fundamentals
  - Discrete structures
- Information Technology
  - Computer Architectures
  - Algorithms and Data Structures
  - Programming Languages
  - Operating Systems
  - Telecommunications
  - Databases
- Organizational and Management Concepts
  - General Organization Theory
  - Information Systems Management
  - Decision Theory
  - Organizational Behavior
  - Managing the Process of Change
  - Legal and Ethical Aspects of IS
  - Professionalism
  - Interpersonal Skills
- Theory and Development of Systems
  - Systems and Information Concepts
  - Approaches to Systems Development
  - Systems Development Concepts and Methodologies
  - Systems Development Tools and Techniques
  - Application Planning
  - Project and Risk Management
  - Information and Business Analysis
  - Information Systems Design
  - Systems Testing and Implementation Strategies
  - Systems Operation and Maintenance
  - Systems Development for Specific Types of IS

IS graduates are expected to be highly qualified and motivated, with in-depth knowledge and understanding of C&IT. They may be expected to take up positions such as, but not limited to: application software developers, system programmers, system analysts, project managers, software designers.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Professional Standards of a Master in Information Systems

1. General characteristics of MSc in Information systems

The professional suitability of a Master in Information systems (IS) is to carry out investigations; to develop and deploy and to manage both of these; to do research and to teach in the field of Information Systems in view of their application in industry, science, education, the public and private sectors, banking, transport, health care, environment protection, etc. An MSc in IS should possess professional expertise.

In order to develop a firm understanding of the scientific approach, students must have direct hands-on experience with hypothesis formulation, experimental design, hypothesis testing and data analysis as well as with design, analysis and interpretation of qualitative research. Student must develop an understanding of various scientific methods and experience this mode of inquiry in courses that provide some exposure to laboratory work and empirical field work in organisations. They may acquire their scientific perspective in a variety of domains, depending on programme objectives and their area of interest.

2. Common skills

Upon graduation, the MSc in IS should have the following most common skills to:

- identify and present his/her own solutions to problems in the field of Information Systems (IS);
- apply creatively in practice the acquired knowledge;
- critically analyse and apply a range of frameworks, concepts, principles and practices of the subject in the context of loosely specified problems, showing effective judgement in the selection and use of tools and techniques;
- adopt a complex technical, social and economical approach and use modern methods and tools when solving an assigned task.

3. Specific skills

Upon graduation, the MSc in IS should also possess the following more specific skills to:

- analyse and understand organisational activity and its management in terms of IS support (potentially) integrated to them;
- create, develop and maintain modern information systems in all phases of its life cycle;
- manage the change of organisation in the context of development, adaptation and implementation of information systems;
- demonstrate a sound understanding of the main areas of the body of knowledge and the theory of IS, with an ability to exercise critical judgement across a range of issues;
- produce work involving problem identification, user requirements specification, analysis, design and development of an information system, along with appropriate documentation. The work must show a range of

problem solving and evaluation skills, draw upon supporting evidence, and demonstrate a good understanding of the need for quality.

4. Additional skills

These skills are not concerned with specific IS-related field of study. Instead, they are meant to satisfy general student interests in IS. They would be acquired throughout the whole course of study. These skills include the ability to:

- demonstrate the ability to work as an individual with minimum guidance and as either a leader or member of a team;
- follow appropriate practices within a professional, legal and ethical framework;
- identify mechanisms for continuing professional development and life-long learning;
- explain a wide range of applications based upon the body of knowledge.

5. IS Body of Knowledge

The IS Master's education is based on training in the following areas with in-depth studies in at least one of them:

- A core of IS Knowledge
- Integration of IS and Business Foundations
- Broad Business Organisation and Real World Perspective
- Academia
- Consulting
- Data Management and Data Warehousing
- Decision Making
- Electronic Commerce
- Enterprise Requirements Planning
- Global IT Management
- Knowledge Management
- Managing the <is Function
- New Ways of Working
- Project Management
- Systems Analysis and Design
- Technology Management
- Telecommunications

Research and Master's Thesis in accordance with the student's own interests, abilities and development perspectives in the areas of specialized training.

References:

IEEE Computer Society/ACM http://www.computer.org/education/cc2001
Bologna Declaration, Lisbon Recognition Convention
Diploma Supplement, ECTS

Comparable Curricula

Curricula of a Bachelor in Computer Science

Curricula of a Bachelor in Computer Engineering

Curricula of a Bachelor in Software Engineering

Curricula of a Bachelor in Information Systems

List
of the questioned companies
from
THE BULGARIAN BRANCH ASSOCIATION
OF ELECTRONIC INDUSTRY AND INFORMATICS

DEMONICS LTD.
E-mail: demonics@mail.techno-link.com
http://www. techno-link.com/clients/demonics

DZU JSC
E-mail: staev@dzu.inetg.bg
http://www.dzu.inetg.bg

ELECTRONICA JSC
E-mail: e-ka@bulnet.bg

ELECTRON RADIOCOM Ltd.
E-mail: elmobcom@bgnet.bg

INDUSTRIAL SOFTWARE
E-mail: indsoft@einet.bg
http://www.indsoft.bg

INMAK- 2000 Ltd.
E-mail: inmak@goce.ttm.bg

INTERPROGRAMMA JSC
E-mail: inter@mail.techno-link.com
http://www.techno-link.com/clients/inter

ISOMATIC LABORATORY Ltd.
E-mail: peter_burton@compuserve.com
http://www.isomatic.co.uk

OKTO-7 Ltd.
E-mail: octo@botev.ttm.bg
http://www.clients.ttm.bg

RING ENGINEERING
E-mail: ring@engineer.com
http://www.ring.dir.bg

SPECIALIZED BUSINESS SYSTEMS Ltd.
E-mail: sbs@sbline.net
http://www.sbline.net

SIGMA PLUS
E-mail: sigmapl@plov.omega.bg
http://www.sigmapl.dir.bg

TECHNOLOGICAL CENTRE - CNIKA
E-mail: cnika@cnika.bg
http://www.cnika.bg

TECHNOLOGICAL CENTRE - INSTITUTE OF MICROELECTRONICS
E-mail: ime@mb.bia-bg.com
http://www.tcime.bg

TEKOM-3 Ltd.
E-mail: tekom3@botev.ttm.bg
http://www.tekom3.declera.com

TEMA LTD.
E-mail: tema@spnet.net
http://www.tema.bg

A N N E X 2

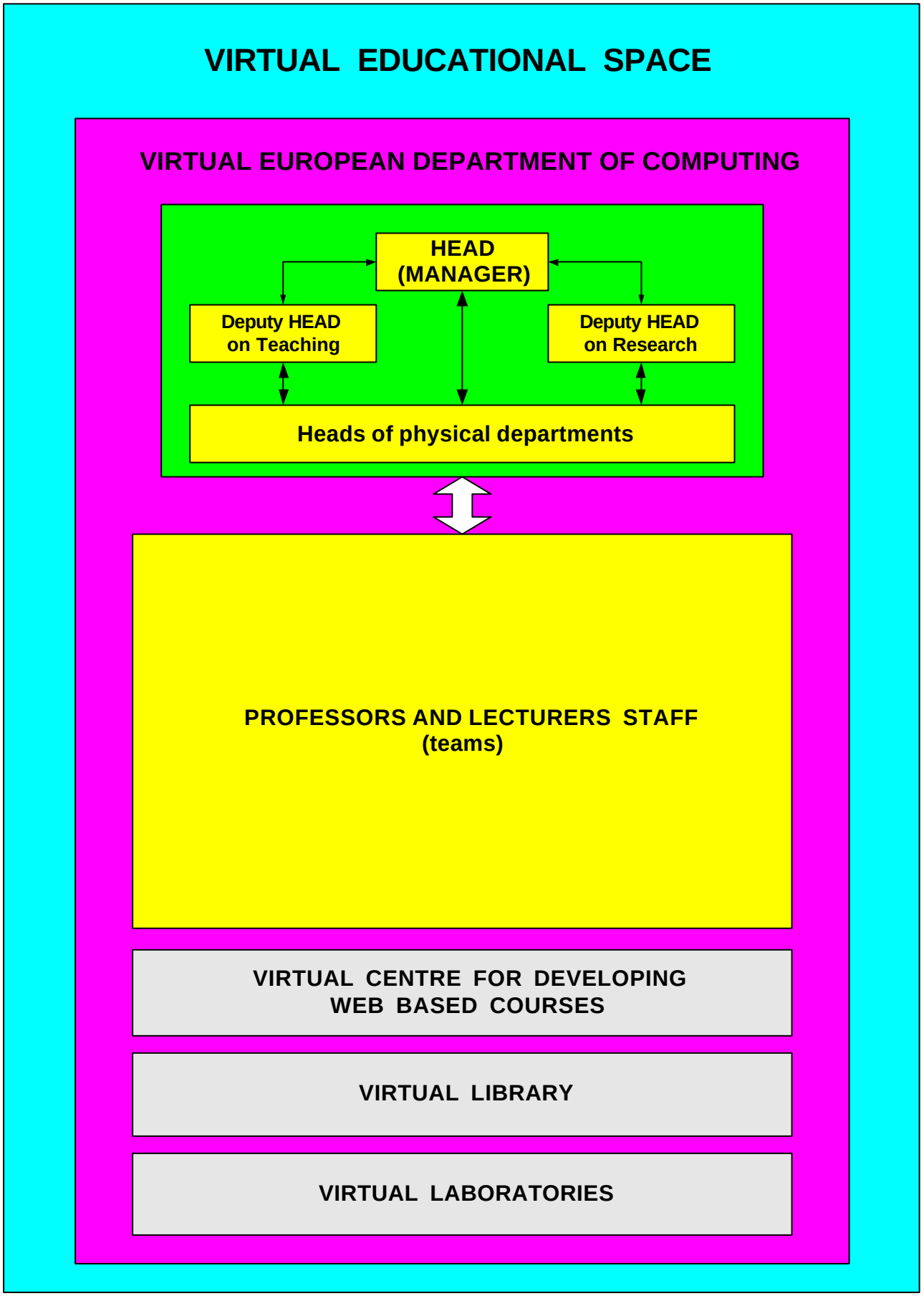
Vision for a Virtual European Department of Computing (VEDoC)

NEED FOR and PURPOSE OF the establishment of the VEDoC:
The ever growing needs of the information society necessitate constant improvement of the academic preparation of specialists in computing, who will be expected to maintain and develop the platform of this society. These needs can best be answered only through unification of the resources and the experience of leading Departments of Computer Systems and Technology (CST) in European Universities.

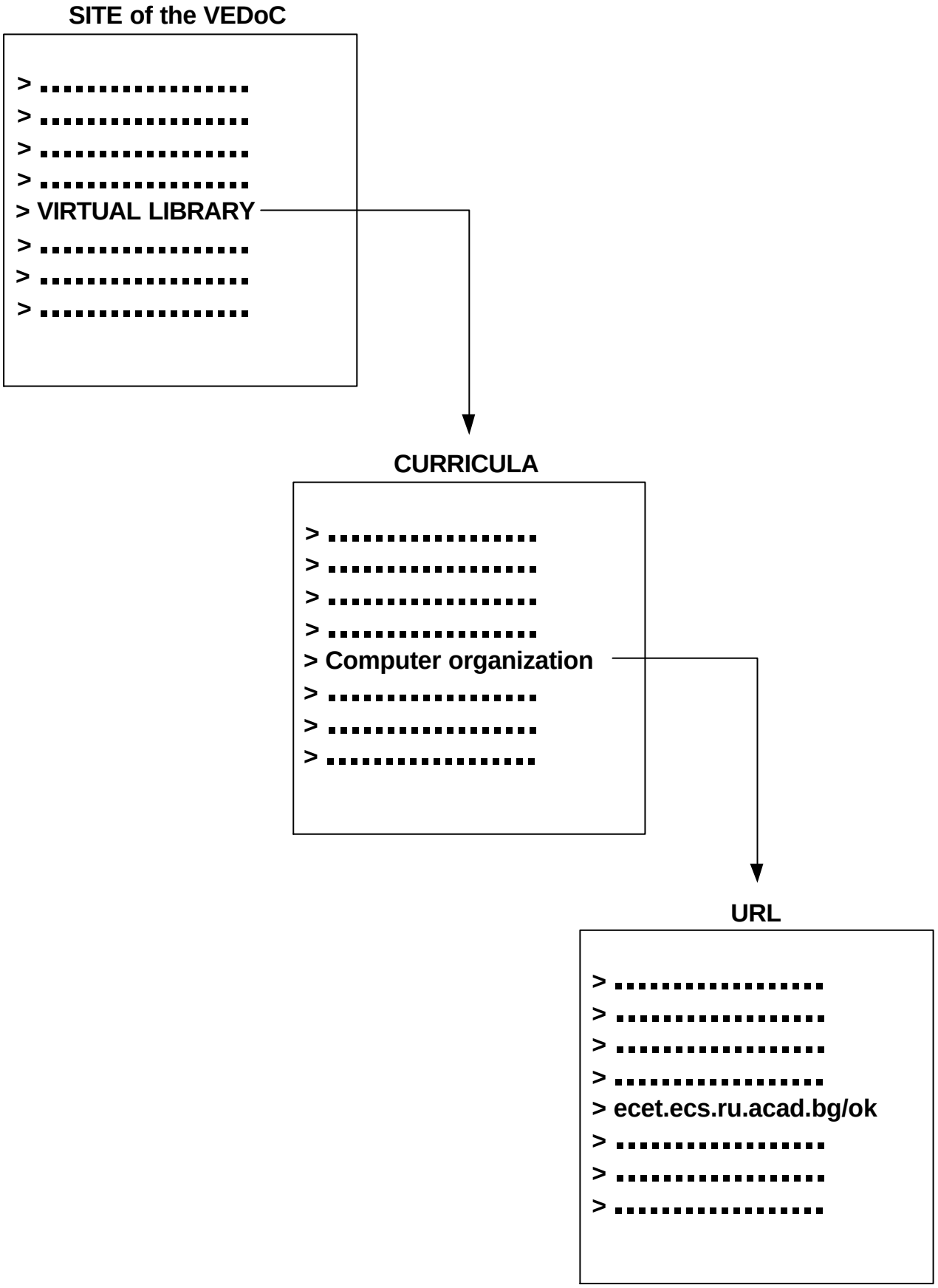
PREREQUISITES for the establishment and maintenance of the VEDoC:
- Comparable professional standards;
- Comparable curricula;
- Comparable syllabi;
- ECTS;
- Fast and reliable Internet connection of all physically existing Departments and all students;
- WEB based courses with virtual laboratories;
- Good reading and writing competence in English, German, French, Russian or other relevant foreign languages, on the part of faculty and students.

MEMBERSHIP AND STRUCTURE
The VEDoC will have a collective membership of all partner departments in the ECET Thematic Network, after they confirm their consent. The VEDoC will be managed by a Council, whose members will be chosen from the Heads of those physically existing partner departments. The Council will have a Chairperson and Vice Chairpersons.

MODE of FUNCTIONING (as seen by the students):
The students will choose those courses from the VEDoC curriculum which will provide them with the theoretical knowledge and practical skills required for obtaining credits for a Bachelor's, or, respectively, Master's Degree. Online guidance will be available to help them find the best route for them within the overall curriculum. For each course chosen, the students will choose a site from among those offered by the VEDoC. They will then study the material and undertake the associated assessment. Having accumulated the required number of credits the students will choose a topic for a Diploma project, develop it and defend it virtually.


VIRTUAL EDUCATIONAL SPACE
VIRTUAL EUROPEAN DEPARTMENT OF COMPUTING
HEAD (MANAGER)
Deputy HEAD on Teaching
Deputy HEAD on Research
Heads of physical departments
PROFESSORS AND LECTURERS STAFF (teams)
VIRTUAL CENTRE FOR DEVELOPING WEB BASED COURSES
VIRTUAL LIBRARY
VIRTUAL LABORATORIES

Concept for a Virtual Library



Virtual Centre for Preparing WEB based Courses
(e-Learning Software Platform)

The most general requirements to an e-Learning software platform could be reduced to the following:

- to enable preparing WEB based courses, according to the requirements of the Directorate-General for Education and Culture of the European Commission by giving opportunities for publishing and editing materials, connected to the items, listed below:
  - Course abstract;
  - Syllabus;
  - Literature resources;
  - Lectures;
  - Workshops;
  - Tests;
  - Assignments;
  - Time table;
  - Messages;
  - Conspectus;
  - Information about the instructors;
  - Forum for discussions.
- to include tools for providing course statistics in particular for registration of total number of visits, the number of visits of each learning item (lecture, workshop, test) for each student, students' grades, the level of comprehension of different topics of the learning material, etc. ;
- to be universal and at the same time to enable adapting to the structure and requirements of a specific university;
- not to require any special knowledge and skills in the field of WEB design and programming from the users;
- not to require substantial resources on the server;
- not to require preliminary installation of specific software on the users' workstations;
- to be compatible with the most widespread operating systems and WEB browsers;
- to enable communication between instructors and learners;
- to be protected from non authorized access;
- to be developed by using free software tools and servers in order to be more inexpensive and accessible.

The structure of the implemented at the University of Rousse, Bulgaria e-Learning software platform is presented on Fig.1.

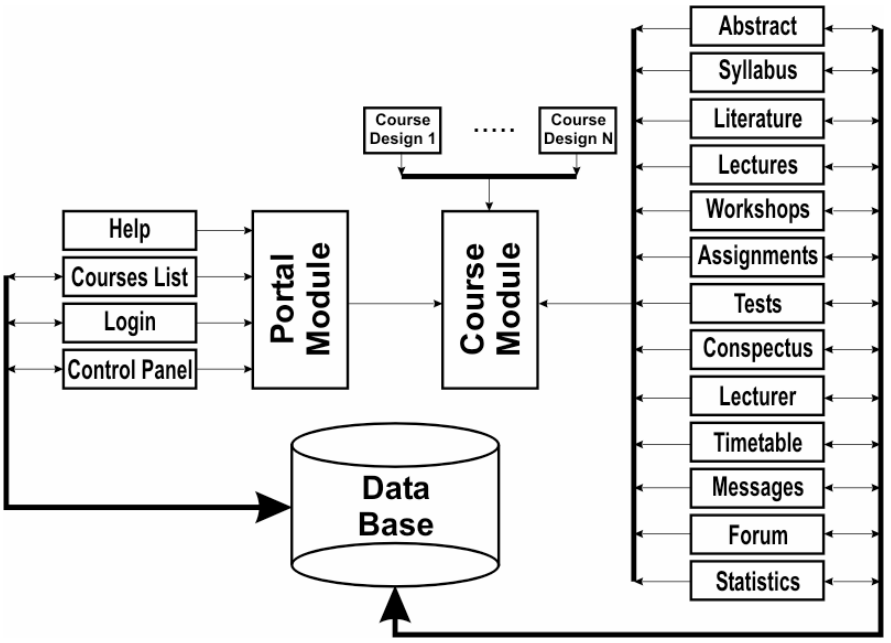


Fig.1. Structural diagram of the implemented e-Learning software platform

The server side technology enables execution of scripts on the WEB server and as a result of this the WEB browser receives only HTML code. PHP (Personal Homepage Hypertext Preprocessor) is one of the advanced solutions of this technology. The software, used for development of the e-Learning software platform includes Apache WEB Server, PHP and MySQL Database Server. These products are free – their source code could be downloaded and compiled for each operation system, and in the same time they are effective and powerful tools for creating dynamic WEB pages.

The portal module **e**-**L**earning **S**h**e**ll (**eLSe**) (Fig. 2) enables users to enter the e-Learning platform and provide the following resources:

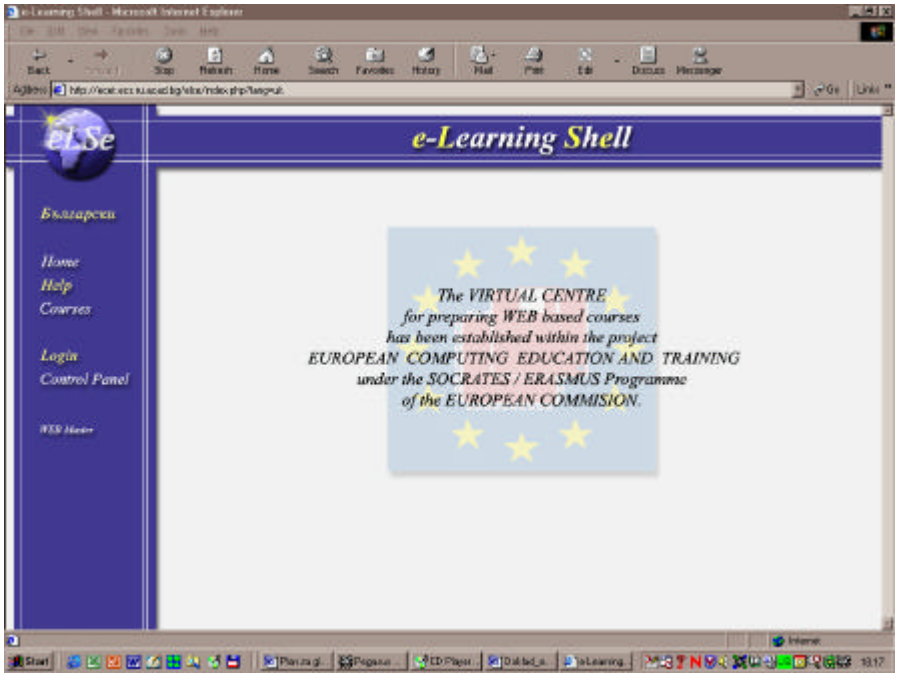


Fig.2. The portal module of **eLSe**

- short user's guide, containing information about the structure of the platform and instructions for use;
- list of faculties of the University of Rousse, list of specialties at each faculty and list of published WEB based courses, included in each specialty;
- authentication form for access to the platform resources and registration form for new users;
- Control panel, containing tools for:
  - changing the password;
  - request for adding new organizational units "Faculty", "Specialty" and "Discipline" to the database of the platform. (By requesting a new "Discipline" the user is offered to choose a course design.);
  - creating new organizational units "Faculty", "Specialty" and "Discipline" in the database;
  - management of the requests – approving, rejection and deleting.

The system provides three access levels:

- first level – this level allows the users to read all of the published materials in eLSe;
- second level – this level allows the users to read all of the published materials in eLSe and to publish and edit materials in specific courses;
- third level – this level covers the first and second level user rights and in addition allows the users to approve or reject requests for new faculties, specialties and disciplines.

The platform includes tools for changing the content and entering new information to each item of the menu. The access to these tools is based on the user details provided by the portal or course module after authentication. The annotation, syllabus, literature resources and conspectus have to be saved in TXT files. When being published they are uploaded on the server and through a text interpreter are visualized on the screen. The lectures, workshops and assignments could be presented in PDF, .HTM, .DOC or .TXT format. Using of PDF format is recommended since the PDF files can be used across platforms, conversion into PDF compresses the original file size, the software to view PDF files is free and PDF files could not be edited. By publishing a material of this type the system automatically uploads the file to the server and generates a hyperlink to make it accessible for the users. The user can download the needed files to a local drive and use them offline.

The test generator gives the instructors an opportunity for creating tests on preliminary specified by them topics. The following types of test items can be published:

- multiple choice among maximum five possible answers;
- multiple answer among maximum five possible answers;
- fill in the blank.

The instructor specifies the number of answers for the multiple choice and multiple answer items. Alternative choice (true/false) could be realized too. If necessary, illustrative pictures (photos, schemes, diagrams, etc. as files of type JPEG, GIF or BMP) could be attached to each question. Depending on the difficulty the instructor can assign different number of points to each question. By selecting a test topic, 6 questions appear on the screen randomly retrieved from the database. After completing the test the student clicks on the OK button and can see the results

online. Apart from the student's grade the system displays the wrong answers and corresponding to them right ones. It is to be remarked that at this stage of development, the test generator is suitable mostly for self-control.

The system offers the following tools for asynchronous communication – e-mail, message board, where only the instructor has rights for publishing and editing of messages and forum, where all the users can publish new topics and comments.

The tools for course statistics make possible analysis of the course effectiveness by providing information about the total number of visits, tracking the visits of each student to the lectures, workshops and tests, reporting the tests results, classifying the students by their grades and the test topics by difficulty.

The system allows publishing materials written in English or Bulgarian. Since the system messages are included in two text files that are easy to edit, the languages could be changed very quickly.

The WEB course "Computer Organization", published using **eLSe** is presented on Fig. 3.

Fig.3. The WEB course on "Computer Organization"

The features of **eLSe** have been compared with these of the most popular e-Learning software platforms. From Table 1 one could see that the implemented e-Learning platform is compatible with the best solutions in this field and provides the necessary tools for effective electronic learning.

Table 1

	WebCT	Blackboard	Learning Space	First Class	Top Class	**eLSe**
Learner tools						
WEB browsing						
Security	●	●	●	●	●	●
BBS file exchange	●	●	●	●	●	●
Asynchronous sharing						
E-mail	●	●	●	●	●	●
Forum	●	●	●	●	●	●
Synchronous sharing						
Chat	●	●	●	●		
Videoconferencing			●			
Student tools						
Self-assessing	●	●	●	●	●	●
Progress tracking	●	●	●	●	●	●
Support tools						
Course						
Course planning	●	●	●	●	●	●
Course managing	●	●	●	●	●	●
Course customizing		●	●	●	●	●
Course monitoring	●	●	●	●	●	●
Lesson						
Instructional designing	●	●	●		●	●
Presenting information	●	●	●	●	●	●
Testing	●	●	●	●	●	●
Analysing and tracking	●	●		●	●	●
Administration						
Installation	●	●	●	●	●	●
Authorization	●	●	●	●	●	●
Registering	●	●	●	●		●
Server security	●	●	●	●	●	●
Remote access	●	●	●	●	●	●
Crash recovery	●	●	●	●		●
Help desk						
Student support	●	●	●	●	●	
Instructor support	●	●	●	●	●	
Language						
Bulgarian language support						●

Virtual Laboratory
(on “Computer Organization”)

The following general requirements to the structure and content of a virtual laboratory could be formulated. The virtual laboratory should:

- offer sufficient, in terms of content and quantity, theoretical material enabling the students to familiarize themselves in details with the phenomena, devices and systems, considered in the course;
- include tests for control of gained knowledge;
- include detailed directions for carrying out the experiments and practical exercises with clearly formulated goal and assignments;
- include interactive software models of the basic (or all, if possible) devices and systems;
- include tools for statistical control that register the attendance of each user, test results and enable score grading of the students, ranking the topics by difficulty etc.;
- include tools for communication, giving opportunities for dialog between the instructors and students, discussions on topics connected to the teaching material or to the work in the virtual laboratory, etc.

In addition, the work in the virtual laboratory should be organized in a manner that avoids:

- technical requirements to the user resources, higher than the user can afford;
- preliminary installation of a specialized software by the users;
- synchronous virtual “presence” of students and instructors;
- continuous connection to the Internet.

The specific requirements to the virtual laboratory on the “Computer Organization” course have their origin from the course syllabus and the course position in the CST (**C**omputer **S**ystems and **T**echnologies) bachelor curriculum. This course is taught during the fourth semester and is the first one that familiarizes the students with the structure and way of operation of the processor and computer (Fig.1). Therefore the virtual laboratory have to consist on software models of the basic components of the processor – the Arithmetic and Logic Unit (ALU), Control Unit (CU), Primary Storage, Top Memory and Interrupt System.

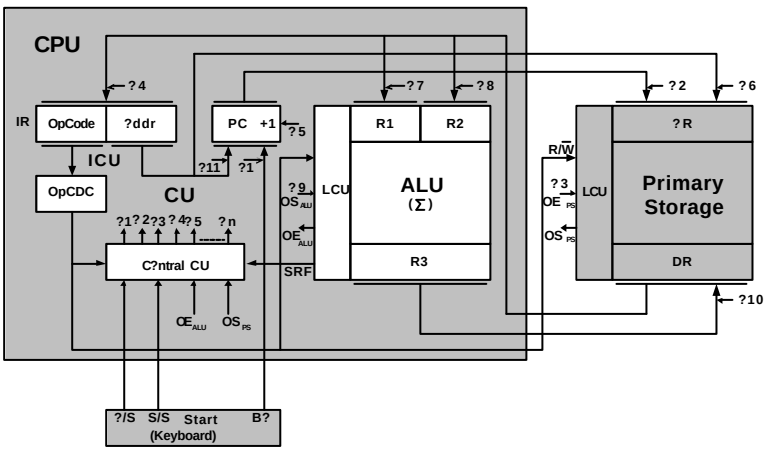


Fig.1. A classic structural diagram of a Von Neumann processor

The ALU to be modelled should be to a maximum degree close to those of the modern processors, which are super scalar in their structure, i.e. they consist of multiple operational blocks, each one of them executing one or several operations with similar algorithms (Fig.2).

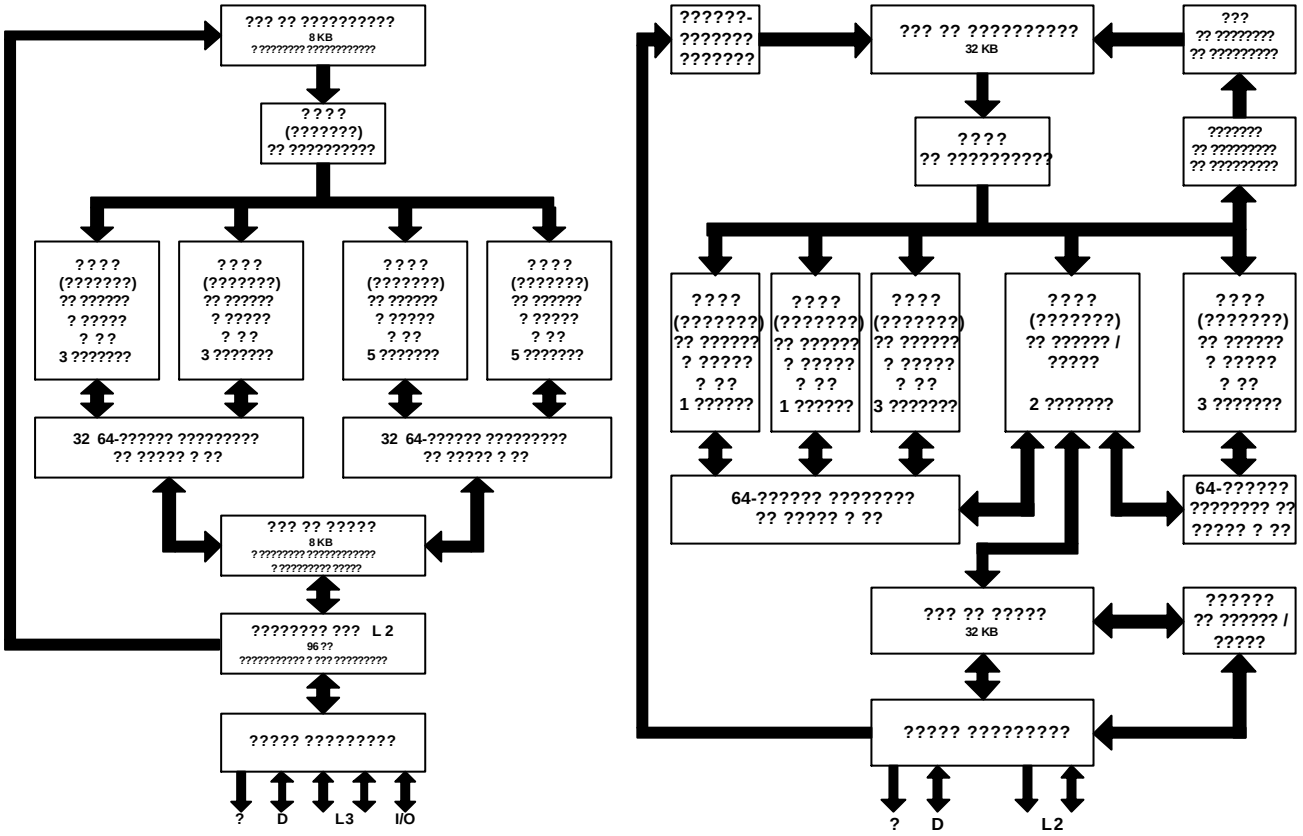


Fig.2. Structural diagrams of classic super scalar processors

From the above presented follows that the virtual laboratory on the Computer Organization course has to include the following software models:

1. SHIFTREG – a software model of a shifting register.

2. CONV – software models of operational blocks for conversion of integers and fractions between decimal and binary number system.

3. NORM – a software model of an operational block for normalization of floating point numbers.

4. SUMM – software models of operational blocks for addition and subtraction of

- binary numbers in binary code,
- binary numbers in twos complement,
- binary encoded decimal numbers.

5. ?UL – software models of operational blocks for multiplication

- in binary code or in twos complement,
- with low or high bits of the multiplier
- with shifting the sum of the partial products to the right or
- with shifting the multiplicand to the left.

6. ACCELMUL – a software model of an operational block for accelerated multiplication.

7. DIV – software models of operational blocks for division
- in binary code or in twos complement,
- with or without restoration of the reminder,
- with shifting the reminder to the left or
- with shifting the divisor to the right.

8. ACCELDIV – a software model of an operational block for accelerated division.

9. SQRT 1 – an introductory program for calculation of square root of fixed point numbers.

10. SQRT 2 – an introductory program for calculation of square root of floating point numbers.

11. BMPUO – a software model of a microprogramming unit for operation control.

12. CACHE – a software model of the cache memory.

13. INTSYS – a software model of the interrupt system.

14. CPU – a software model of a hypothetic single-address processor.

15. CPU with Stack – a software model of a processor with stack.

The software models have to meet the following requirements:
- to be to a maximum extent close to the real operational blocks and at the same time to be simple in order to be applicable for primary introduction to the structure and the way of operation of the processor;
- to be implemented as independent Windows 9x / NT applications, to be easy to download to a local drive and to work in offline mode;
- to be attractively designed and easy to work with;
- to be comprehensible and handy. For this purpose:
  - the full names of the operational block components and the different microoperations have to be hinted when the cursor points to a component image or to a functional button;
  - all the necessary user's actions to be reduced to clicking on functional buttons or component images;
- to contribute to getting and assimilating a clear concept about the structure of an operational block and its operational unit;
- to be interactive by giving the user an opportunity to simulate the control unit of the operational block in order to register the comprehension level of the microalgorithms of different operations;
- to enable registering the total number of executed microoperations, the number of mistakes and how long the user has worked with the model;
- to hint the correct microoperation after registering every second mistake;
- to stimulate and enable the execution of the algorithm repeatedly.

To meet the requirements, formulated above, the virtual laboratory should have the structure and content, shown on Fig.3.

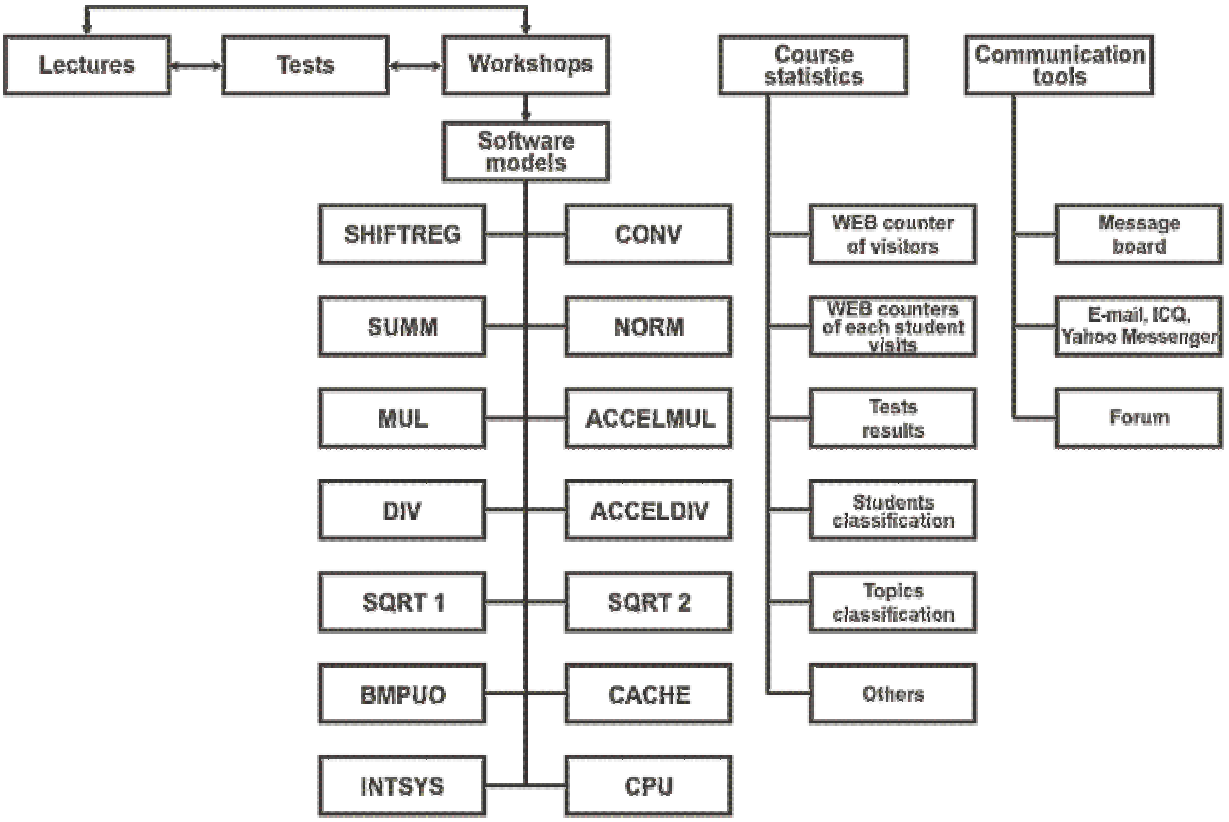


Fig.3. A conceptual model of a virtual laboratory on “Computer organization”

The software models SHIFTREG, CONV, NORM, SUMM, ? UL, ACCELMUL, DIV, BMPUO, CPU have been already implemented as independent Windows applications. The size of each model varies between 372 and 588 KB (185 and 249 KB in WinZip archive) and this makes them easy for downloading. They run on Windows 9x, 2000, ME and XP.

The implemented models have been used during the practical exercises on Computer Organization discipline. An anonymous inquiry among the students, who worked with the models, has been taken and the results show that over 60% of them think, that working with the models is easy and helps them to assimilate better the microalgorithms of different operations.

Two of the implemented software models are shown on Fig. 4.

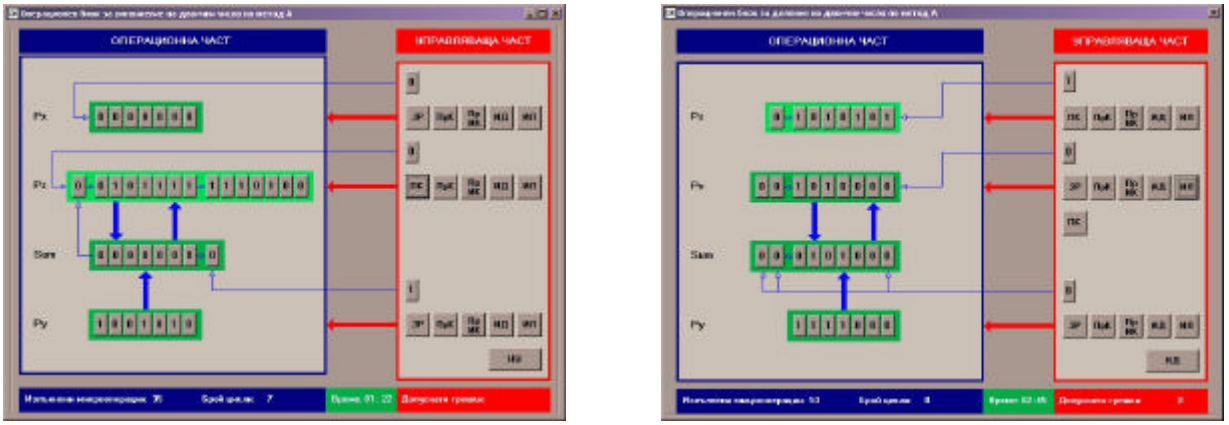
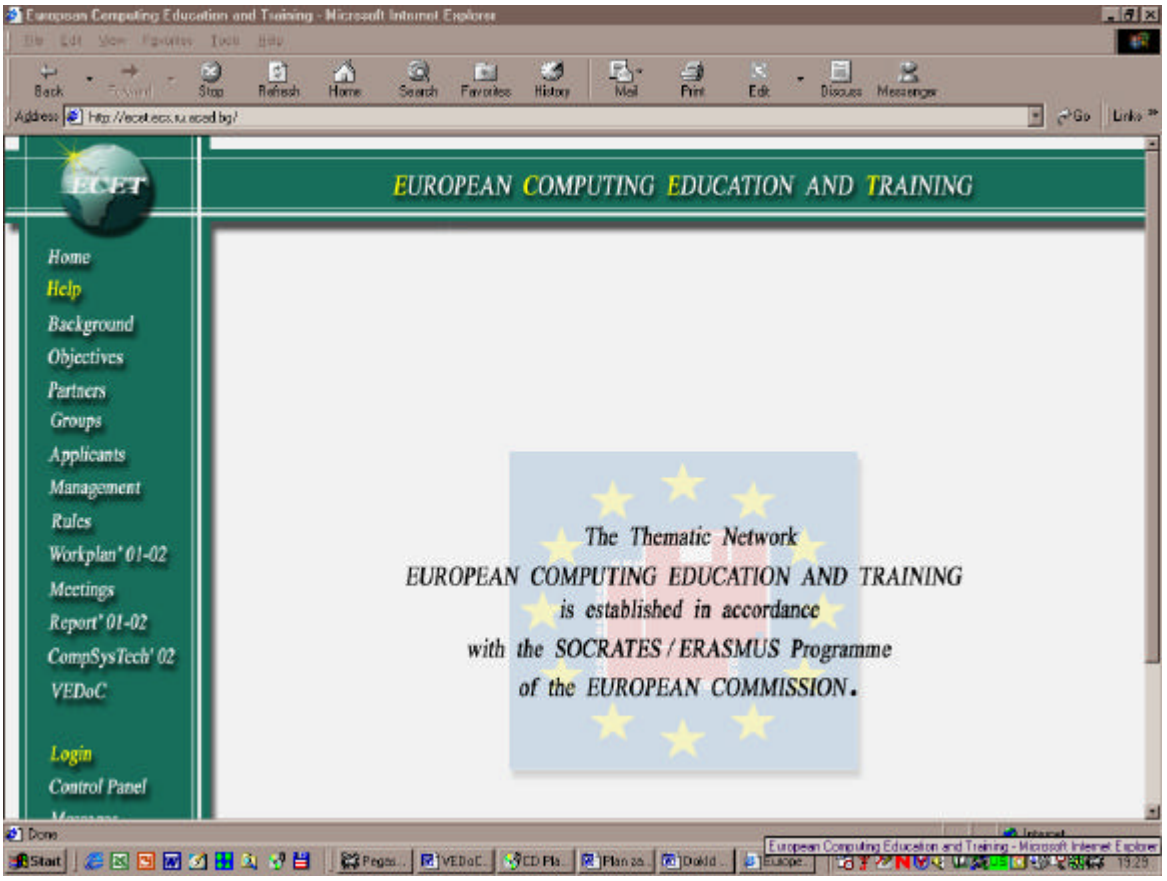
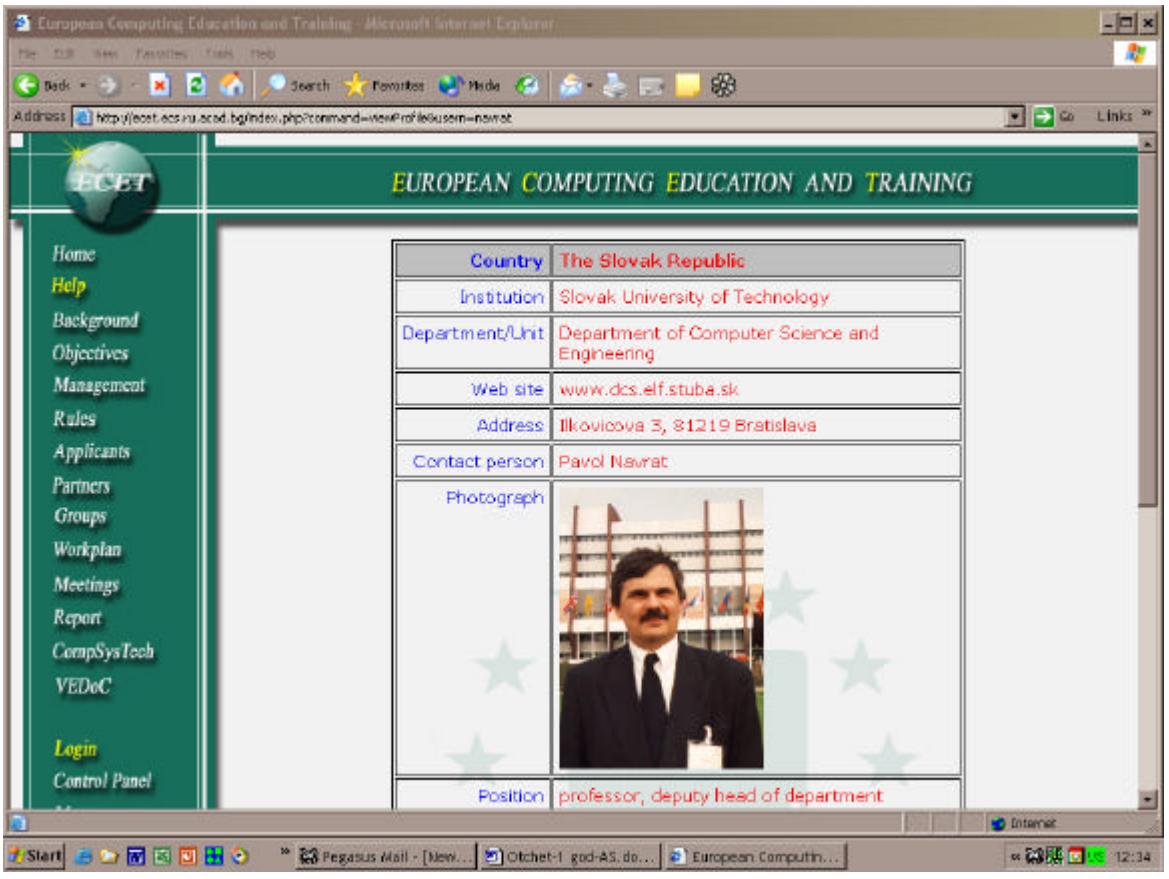


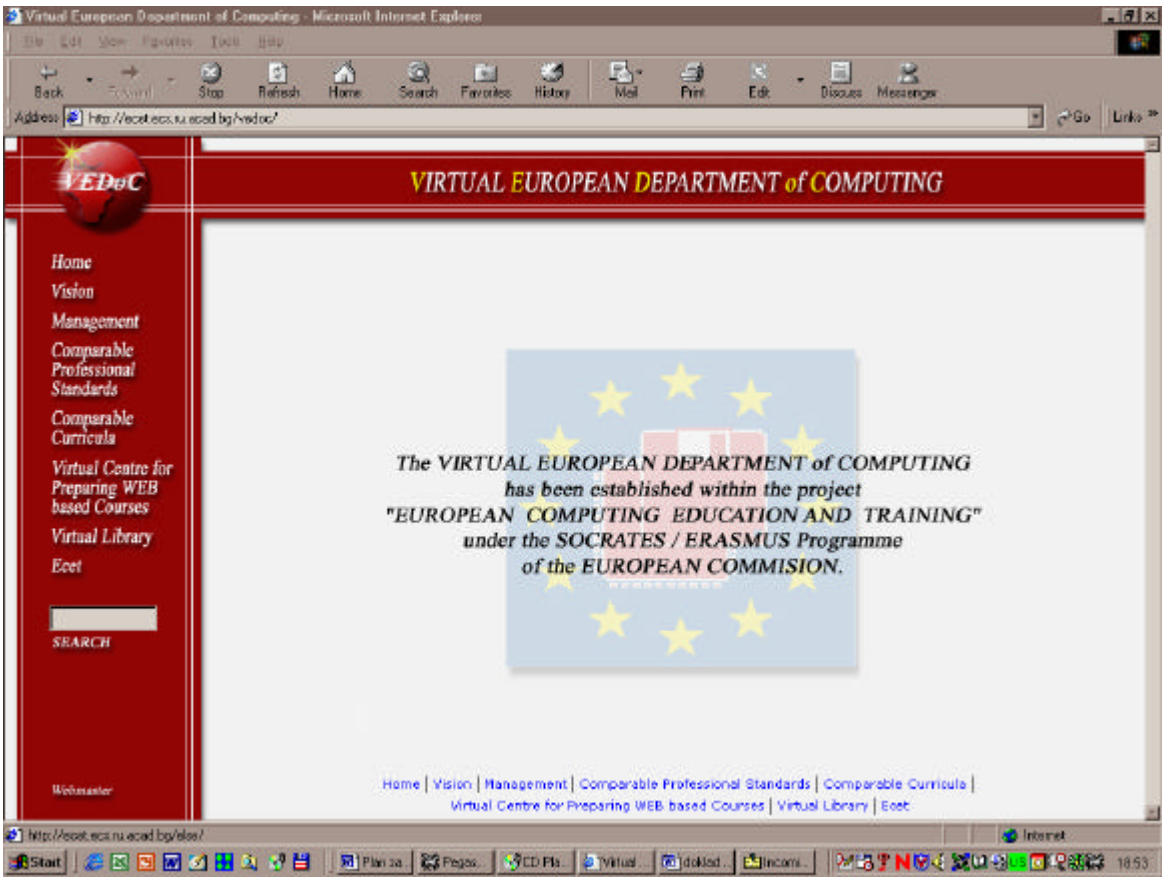
Fig.4. Software models of operational blocks for multiplication and division

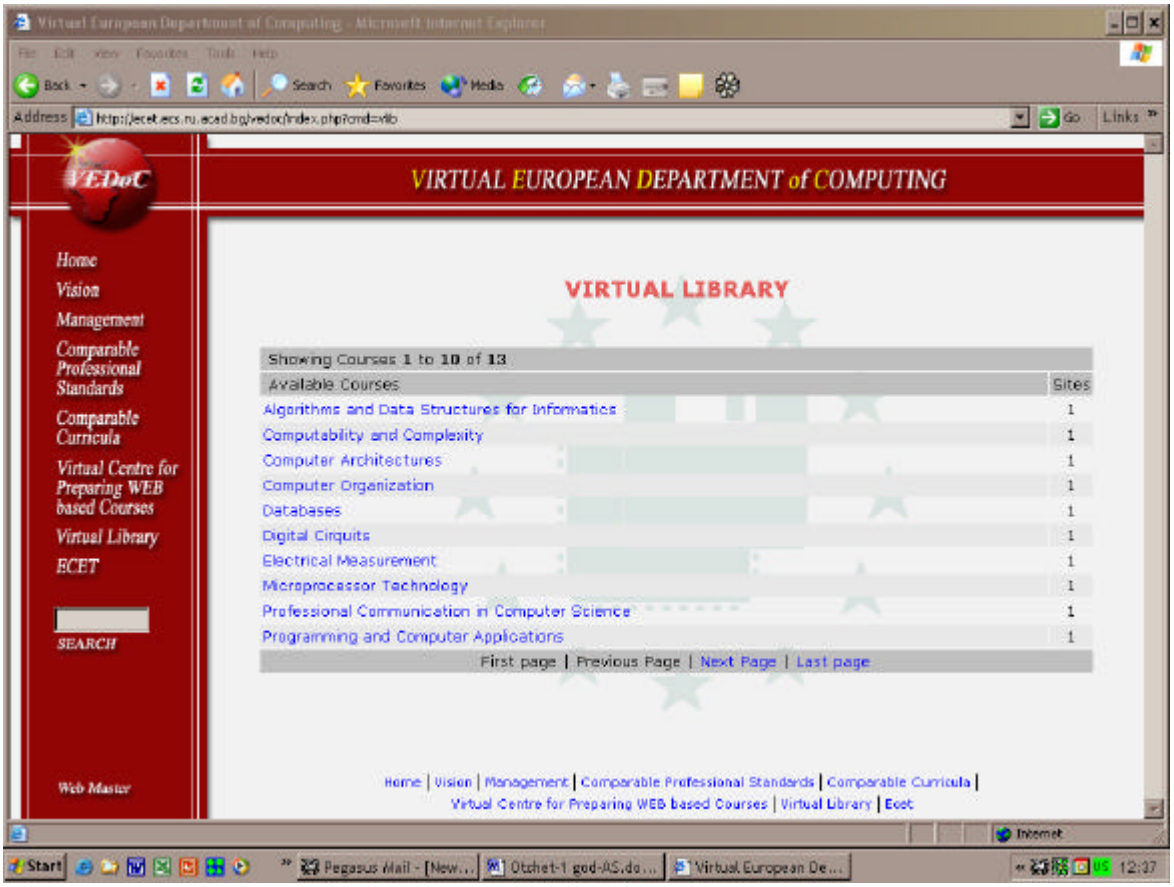
WEB site of the Thematic Network ECET
URL:http://ecet.ecs.ru.acad.bg/



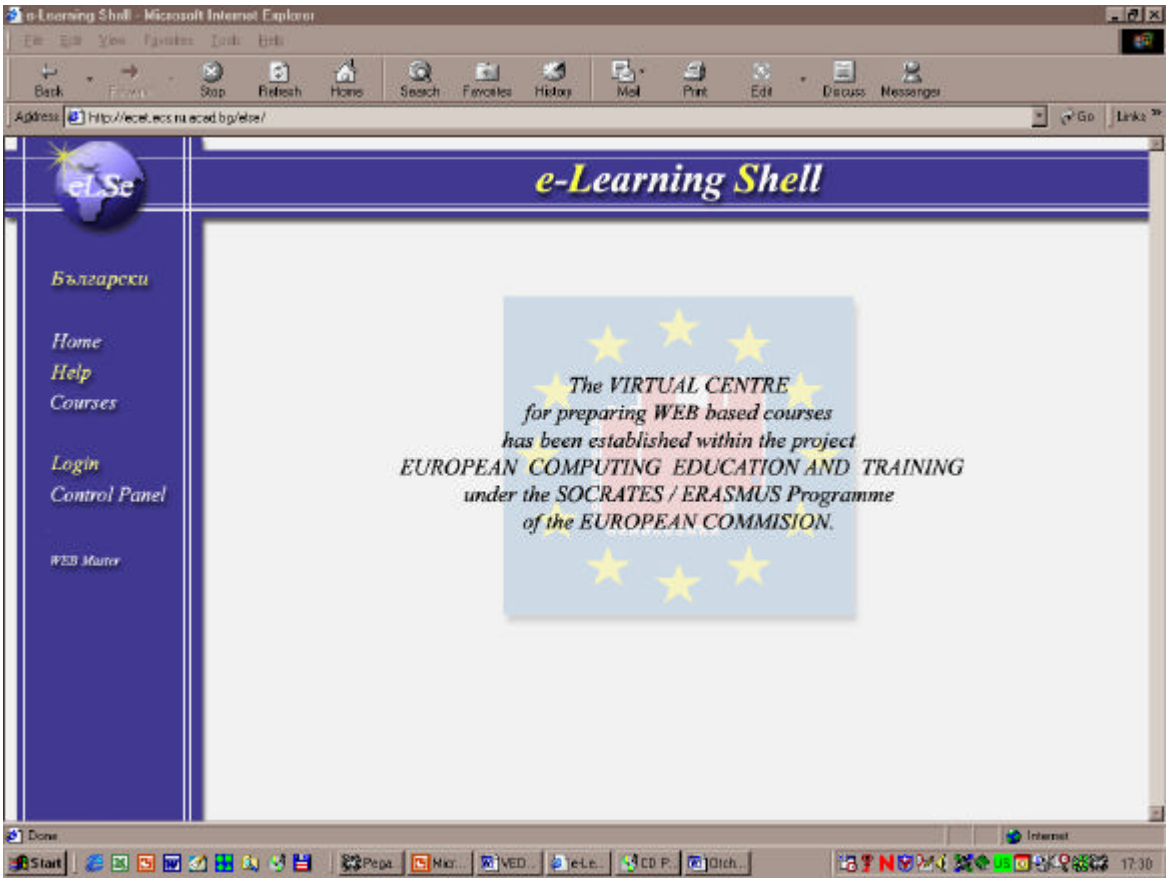


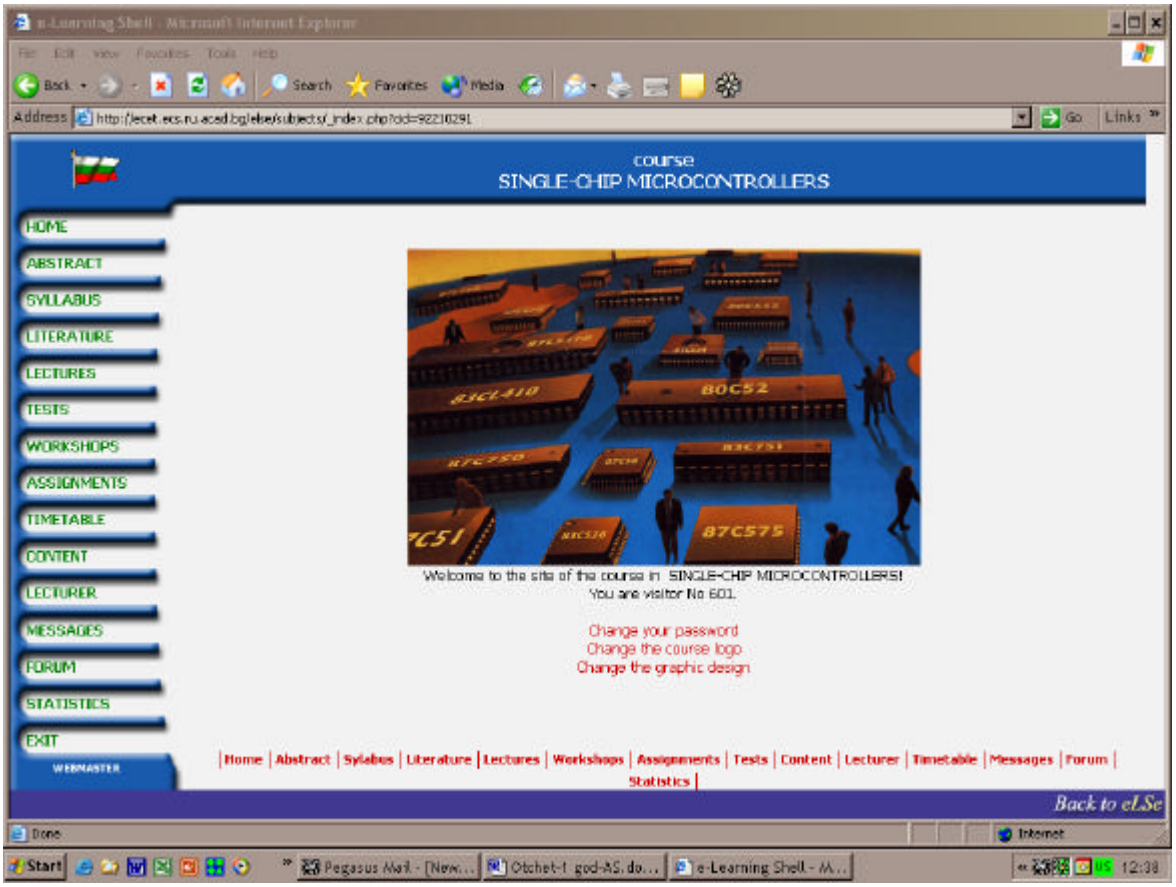
WEB site of the Virtual European Department of Computing
URL: http://ecet.ecs.ru.acad.bg/vedoc/



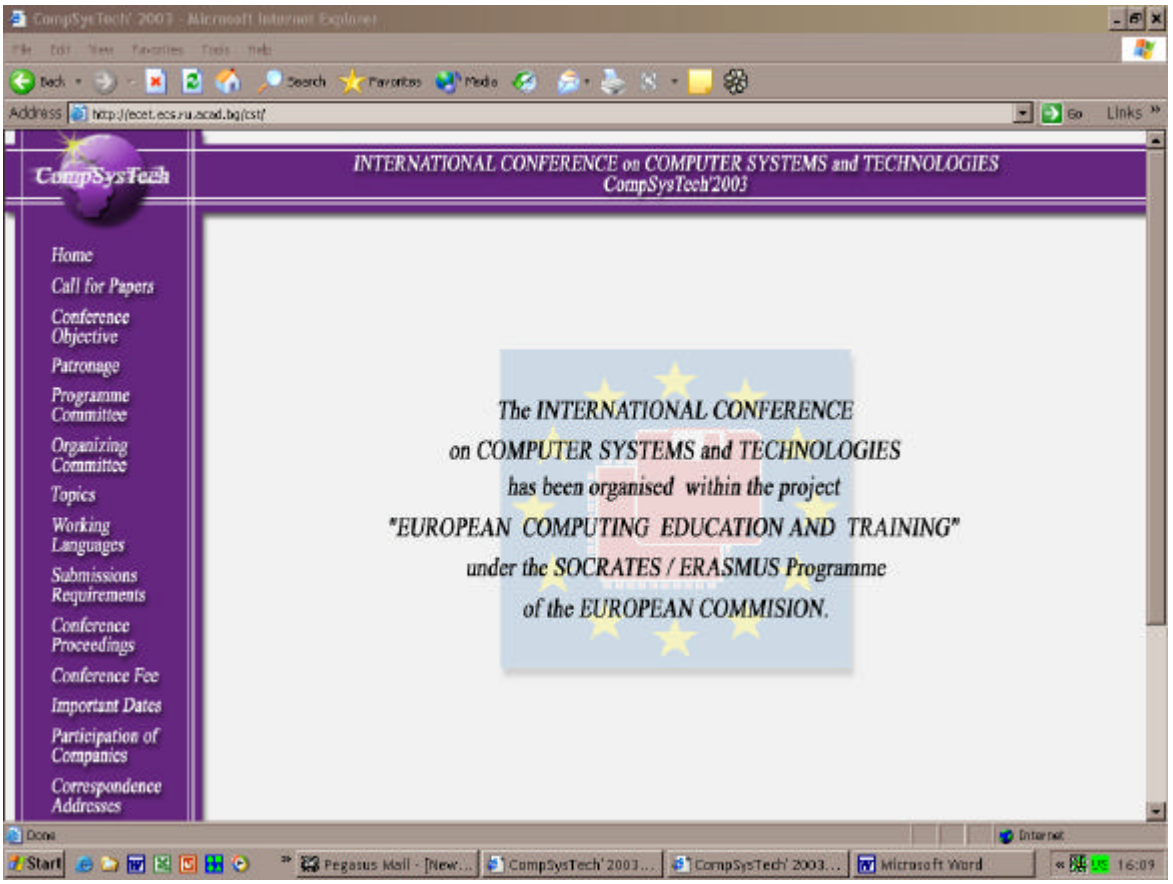


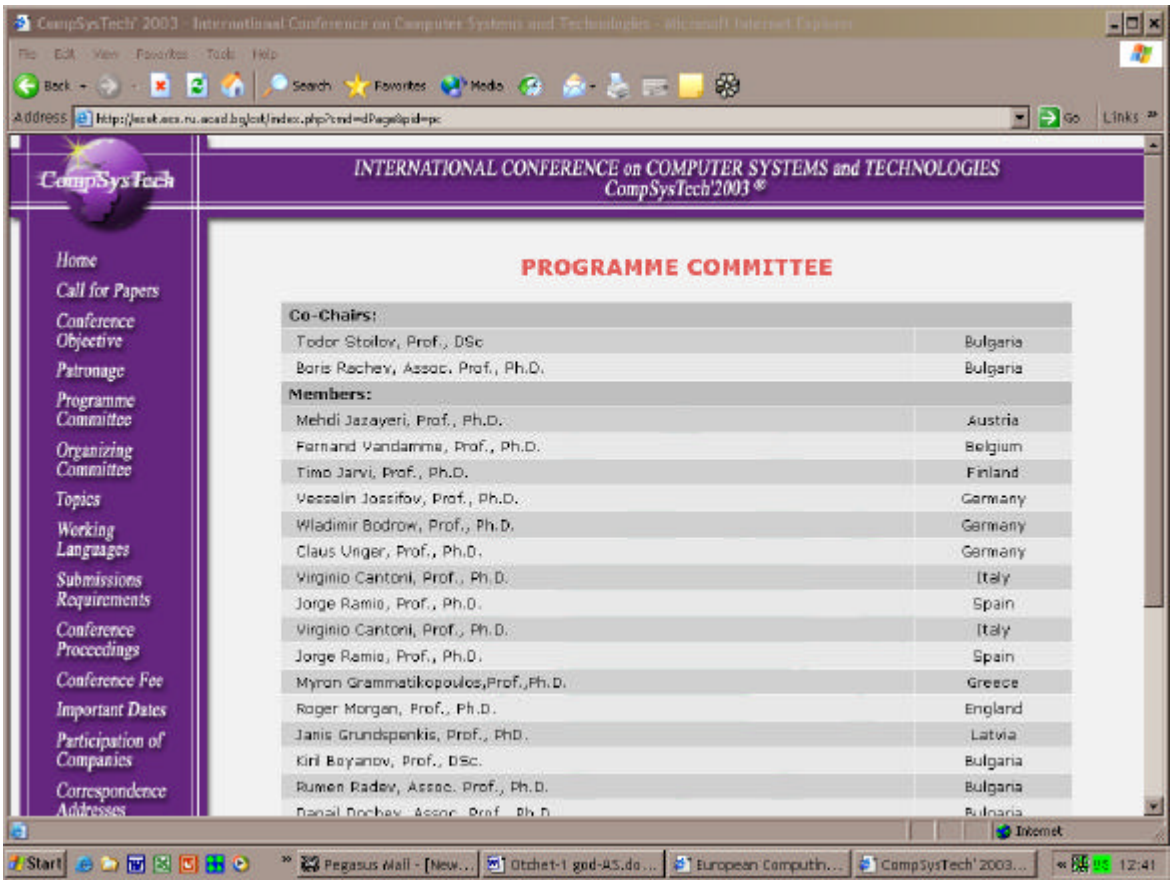
WEB site of the Virtual Centre for Preparing WEB based Courses
URL: http://ecet.ecs.ru.acad.bg/else/





WEB site of the CompSysTech'2002
URL: http://ecet.ecs.ru.acad.bg/cst/





A N N E X 3

Partner Agreement

CONTRACT

European Computing Education and Training

213871-CP-1-2001-1-BG-ERASMUS-TN

This contract is made and entered into by and between

ANGEL KUNCHEV UNIVERSITY OF ROUSSE

whose registered office is at 8 Studentska Str., 7017 Rousse, Bulgaria

represented by Angel Sotirov Smrikarov, Vice Rector,

hereinafter referred to as Contractor

and

_____

(Name of the partner institution)

_____

whose registered office is **at *(address of the partner)***

represented by _____

hereinafter referred to as **Partner.**

Whereas, within the framework of SOCRATES ***Erasmus Thematic Networks*** the Contractor has concluded an agreement with the Commission of the European Communities (hereinafter referred to as **Commission**) for the Project called **European Computing Education and Training** (hereinafter referred to as **Project**). This agreement (hereinafter called **CEC Contract**) shall form an integral part of the present Contract.

The Contractor and the Partner shall be bound by the terms and conditions of the CEC Contract SOCRATES ***Erasmus Thematic Networks*** No. **213871-CP-1-2001-1-BG-ERASMUS-TN** signed between ***Boris Tomov, Rector of the University of Rousse*** and the Commission on ***02.01.2002.*** The Annexes of the CEC Contract constitute Annexes A, B and C of the present Contract. Annex A of the present Contract gives the Work plan. Annex B contains forms to be used by the Partner for financial reporting to the Contractor. Annex C includes a booklet of Financial Documents, containing a copy of the Financial Agreement (FA), Administrative and Financial Handbook (A&FH).

The Contractor and the Partner shall be bound by the terms and conditions of any further amendments to the CEC Contract in accordance with the procedure set out in Article 13.

The Contractor and the Partner have agreed to define their rights and obligations with respect to carrying out specific tasks relating to the Project as described in Annex A of this Contract. Therefore, the following is hereby agreed between the Contractor and the Partner.

Article 1. - The Objective of the present Contract

On the basis of the present Contract the Contractor and the Partner shall contribute to the achievement of the requirements of the CEC Contract together with the other parties (Partners and Subcontractors) performing the CEC Contract in accordance with the terms and conditions as stated in the present Contract.

Article 2. - The Project Period

The present Contract shall come into force on the day when it has been signed by both the Contractor and the Partner respectively but shall have retroactive effect from ***1/10/2001***. This Contract will cover the period up ***1/10/2001*** to ***30/09/2002.***

Article 3. - The Obligations of the Contractor and the Partner

The Contractor and the Partner shall perform and complete their share of the work under the present Contract in accordance with the requirements set out in Annex A of the present Contract. The Parties to the present Contract shall carry out the work in accordance with the timetable set out in Annex A using their best endeavours to achieve the results specified therein and shall carry out all of their responsibilities under the present Contract in accordance with recognised professional standards.

The Partner shall provide the personnel, facilities, equipment and material necessary to be able to perform and complete the Partners share of the work under this Contract.

The Partner shall carry out the work in such a way that no act or omission in relation thereto shall constitute, cause, or contribute to any breach or non-compliance by the Contractor or by any Partner or any Subcontractor of any of their respective obligations under the CEC Contract. The Partner shall impose the same contractual conditions on any consultants that the Partner engages in the Project for the undertaking of the work.

Article 4. - Allocation of Funds

The maximum financial contribution by the Partner to the Project during the Contract period shall be ……. EURO, in accordance with the financial provisions set out in Annex A.

The maximum Project funding for this contribution from the Commission grant shall be ……. EURO. **This amount does not include funding for subcontracting and other costs**. These type of funding will be given only to those partner who perform activites from Annex A requiring making such expenditure. The Partner shall make an institutional contribution of 30%. Should the declared total expenditure by the Partner be lower than the maximum contribution stipulated above, the percentage funding will be applied to the Partner's real total expenditure.

The allocation of Project funding to the Partner is subject to receipt by the Contractor of the respective Project funding from the Commission.

Article 5. - Record Keeping and Reporting

The Partner shall keep a record of any expenditure incurred under the Project and all proofs and related documents for five years after the end of the period covered by the present Contract.

All invoices to the Contractor must be dated and certified as true and exact by the Financial Officer of the Partner. The Contractor may reject any item of expenditure which cannot be justified in accordance with the rules set out in the Rules for Eligible Expenditure (Annex C - A&FH).

The Partner is required to present to the Contractor on ***10/08/2002*** firstly, interim declaration of the real and total expenditures of the work undertaken during the periods ***01/10/2001*** to ***31/07/2002***, separating expenditures paid out by the Partner and expenditures committed by the Partner but not paid out; and secondly, report on the course of development of the Project activities undertaken by the Partner.

The Partner agrees to supply to the Contractor all the information that the latter finds necessary to ask for concerning the implementation of the present Contract.

The Contractor shall provide the Partner with the appropriate forms (Annex B) for the Declaration of Expenses and the respective instructions for the filling of them.

The Partner shall promptly inform the Contractor of any delay in the performance of the activities undertaken by the Partner under the present Contract.

A Final Report on the Project activities, including a final Declaration of Expenditure, must be submitted by the Partner to the Contractor no later than 10 days after the end of the period covered by the Contract, i.e. **10/10/2002**.

Upon request the Partner shall make available any documentation on Project finance and activities required by the Commission.

Article 6. - Schedule of Payment

University of Rousse shall pay the Partner for work completed satisfactorily according to the description and schedule of this work in Annex A of the present Contract. Payment shall be made within twenty (20) days after the signing of this Partner agreement, and shall not exceed 75% of the total remuneration due to the Partner from Commission funding on the basis of the CEC Contract. The next 15% will be paid after reception and approval by the Contractor of the Declaration of Expenses and the interim activity report by the Partner (by 31/07/2002).

Declarations of Expenditure shall be made in the Partner's local currency and recalculated in EURO using the exchange rate applied by the bank on the day the expenditure is made. The final payment (10%), after the Final Report has been accepted by the Commission, will be paid to the Partner.

Article 7. - Banking Details

The remuneration to be paid to the Partner shall be paid into the Partners institutional account in accordance with the following banking details:

Name and Address of the Account Holder:

Name of Bank:

Address of Bank:

Bank Code:

Swift Code:

Account Number:

The National VAT Number:

Article 8. - Ownership

Subject to constraints imposed by national legislation, the deliverables of the Project, patents, copyrights and Intellectual Property Rights, as well as reports and other documentation resulting from the present Contract, shall be the property of the Contractor and all the Partners of the Project, apportioned between the Contractor and each Partner pro rata to their shares of the total of all the financial institutional contributions made by the Contractor and the Partners together.

Article 9. - Termination

In the event that the Partner fails to perform any obligations under the present Contract or the CEC Contract and does not remedy such failure within 30 days after having received a notice in writing from the Contractor specifying the failure and requiring such remedy, then without prejudice to any other rights or remedies, the Contractor shall be entitled to terminate the present Contract forthwith, without the application of any juridical procedures, by notice in writing to the Partner.

If the Partner or the Contractor breaches the terms of the present Contract, the other party shall have the right to terminate this Contract.

Either party to this Contract shall have the right to terminate this Contract if the other party is insolvent or enters into bankruptcy or liquidation or any other arrangement for the benefit of its creditors.

The Contractor shall have the right to terminate the present Contract if a change in the bye-laws or composition of the Partner affects the conditions for developing the Project.

The Contractor shall have the right to terminate the present Contract if the Partner has made false declarations to the Contractor on work carried out or on expenditure. If the present Contract is so terminated, the Contractor may require the Partner to reimburse all or part of the payments made under this Contract.

Article 10. - Damages for Non-performance

If the present Contract is terminated for the reason that the Partner fails to perform its obligations under the present Contract, the rights and licences granted to the Partner pursuant to this Contract shall cease immediately, and the Partner shall forfeit the right to reimbursement for obligations performed.

Furthermore, if the Contract is terminated by the Contractor due to non-performance of obligations by the Partner, the Partner shall be responsible for and pay any direct cost increase resulting from the necessity to remedy the Partners breach of responsibilities and to assign the tasks of the Partner as specified in the present Contract to one or several parties.

Article 11. - Liability

The Partner shall be solely liable for any loss, destruction, damage, death or injury to the persons or property of the Partner or of the Partners employees or of third parties resulting directly or indirectly from performance of the work under the present Contract.

The Partner shall indemnify the Contractor and any other partner against any claim made against or liability incurred by the Contractor in respect of any infringement by the Partner of any copyright or other industrial property right or any statutory protection in respect of any report or other material supplied by the Partner to the Contractor pursuant to the present Contract.

The Contractor shall not be required to provide insurance cover to persons participating in activities undertaken by the Partner under the present Contract.

Article 12. - Confidentiality

The Contractor and the Partner must treat as confidential and must use all reasonable effort to ensure that they do not disclose to any person any information of technical, commercial or financial nature or otherwise relating in any manner to the execution of the Project, except in the circumstances detailed in the following paragraph below.

The above clause relating to confidentiality shall remain in force for a period of five years after the completion of work under the CEC Contract but shall not in any case be deemed to extend to any information which the receiving party can show

- was at the time of receipt published or otherwise generally available to the public;
- has after receipt by the receiving party been published or become generally available to the public otherwise than through any act or omission on the part of the receiving party;
- was already in the possession of the receiving party at the time of receipt without any restrictions on disclosure;
- was rightfully acquired from others without any undertaking of confidentiality imposed by the disclosing party;
- was developed independently of the work under the CEC Contract by the receiving party.

The above clause relating to confidentiality shall not be deemed to extend to academic publications and public presentations provided that information beyond the general framework of the project deliverables and the characterisation of single test items is not disclosed. However, the Contractor shall be notified of any intention on the part of the Partner to produce such publications and make such presentations.

Article 13. - Modification of the Contract

Changes or amendments to the present Contract shall be approved by both parties to the Contract and become effective when signed by authorised representatives of both parties.

Article 14. - Settlement of Disputes and Applicable Law

If there is a dispute or difference between the parties arising out of or in connection with the present Contract or out of activities undertaken under the present Contract, including disputes regarding quality, the parties shall first endeavour to settle it amicably.

Provided that a dispute cannot be settled amicably, the arbitration of the dispute between the Contractor and the Partner in connection with the present Contract shall be conducted through one-man arbitration in accordance with the laws of Bulgaria.

This Contract is governed by the laws of the ***coordinating country- Bulgaria***.

Article 15. - The Annexes

Annex A. The Workplan of the Project

Annex B. The forms to be used for reporting.

Annex C. Booklet of Financial Documents, containing a copy of the Financial Agreement (FA), Administrative and Financial Handbook (A&FH).

Signatures

For the Contractor:	**For the Partner:**
Name: Angel Smrikarov	Name:
Position: Vice Rector	Position:
Date and Place	Date and Place:
Stamp	Stamp

Annex B
The forms to be used for reporting

Appendix 1: Time Sheet

Project: Thematic Networks 213871-CP-1-2001-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2001 - 30.09.2002

Amount of time spent on the project by*:*

Function in the project:

Date				
day	**month**	**year**	**Activities related to the project**	**hours**
			Total	

Date Signature:

Appendix 2: Internal Report Sheet - Personnel Costs

Project: Thematic Networks 213871-CP-1-2001-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2001 - 30.09.2002

Personnel involved in the project:

Name:

Personnel register reference:

Normal monthly salary: _____ = _____ EURO

Cost to employer per day: _____ =_____ EURO

Time spent on project: _____ days

Total cost: _____ **EURO**

Total Personnel costs	
Personnel Costs to be covered by Socrates grant	
Personnel Costs to be covered by own resources	

Date Signature:

Appendix 3: Internal Report Sheet - Travel + Subsistence Costs

Project: Thematic Networks 213871-CP-1-2001-1-BG-ERASMUS -TN

Institution:

Name of the person:

Period:

Travel

Date	Reason for travel	Destination	Means of transport	Costs
Total costs in EURO				

Subsistence (incl. accommodation)

Number of days	Subsistence costs per day	Total costs

Total costs of travel and subsistence	
Costs to be covered by Socrates grant	
Costs to be covered by own resources	

Date Signature:

Appendix 4: Internal Report Sheet – Equipment and Materials

Project: Thematic Networks 213871-CP-1-2001-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2001 - 30.09.2002

Purchase						
Description of the equipment, technology and/or software purchased	Date acquired (month & year)	**A.** Installation, maintenance, insurance costs	**B.** Cost	**C.** Depreciation rate*	**D.** Utilisation % for project	Amount for project A+(BxCxD)
					%	
					%	
					Total costs for the project in EURO	

* Purchases costing over 1.000 EURO (VAT excluded) must be depreciated over a 3-year period

Rental / Lease						
Description of the equipment, technology and/or software rented/leased	Starting date of the rental / leasing contract	Duration of rental/lease for this contractual period	**A.** Installation, maintenance, insurance costs	**B.** Costs for this contrac-tual period	**C.** Utilisation in % for project	Total amount for project A+(BxC)
					%	
					%	
					Total costs for the project in EURO	

Total costs of equipment and materials	
Costs to be covered by Socrates grant	
Costs to be covered by own resources	

Date Signature:

Appendix 5: Internal Report Sheet - Subcontracting Costs

Project: Thematic Networks 213871-CP-1-2001-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2001 - 30.09.2002

Name of subcontractor	**Description of activity**		**Number/date of subcontract**	**Costs**
Name of consultant /expert	**Description of activity**	**Cost per day**	**Number of days**	
			Total costs in EURO	

Note: The remuneration of a consultant /expert should not normally exceed 400 EURO per day (VAT or equivalent sales tax and travel/subsistence costs excluded)!

Total costs of subcontracting & consultancy	
Costs to be covered by Socrates grant	
Costs to be covered by own resources	

Date Signature:

Appendix 6: Internal Report Sheet – Other Costs

Project: Thematic Networks 213871-CP-1-2001-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2001 - 30.09.2002

Production costs for: ***(Product)*** _____

Printing	Number	Costs per unit	Total costs in EURO
Translation	Pages/lines	Costs per page/line	Total costs in EURO
Dissemination	Number	Costs per unit	Total costs in EURO
Other:			
		Total	

Other (please specify):

Type of cost	**Description of activity:**	**Total costs in EURO***
Bank charges, bank transfer		
The hiring of conference halls		
Internet communication costs		
	Total	

Total costs of documentation	
Costs to be covered by Socrates grant	
Costs to be covered by own resources	

Date Signature:

Appendix 7: Internal Report Sheet – General Costs

Project: Thematic Networks 213871-CP-1-2001-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2001 - 30.09.2002

Type of cost	**Description of activity:**	**Total costs in EURO***
Communication costs (postage, fax, telephone, mailing, etc.)		
Office supplies		
Photocopies		
	Total	

Total costs of documentation	
Costs to be covered by own resources	

Date Signature:

A N N E X 4

EVALUATION REPORT

Deborah Trayhurn
Leader of the Evaluation Board
and Stanley Oldfield
Member of the Evaluation Board

Introduction

This report provides an internal evaluation of the work undertaken on the project to date. It is the output from an Evaluation group working specifically to provide feedback on the project work. All members of the Evaluation group are members of the project. The group is representative of the countries engaged in the project. Many of the group play other roles as members of other groups alongside their Evaluation work.

Approaches adopted for this work include as inputs: examination of the proposal, plan and written materials relating to activities; discussion of outputs achieved based on project discussions undertaken by the project overall and the Evaluation group and finally consideration of processes adopted by the project.

The project start date was proposed to be October 2001. Project monies were confirmed later, so the main activities for this first year have been undertaken in a shortened period effectively starting from February 2002. This report relates to work undertaken up to September 2002.

The overarching aim of the project was stated in the project proposal as seeking 'to improve the quality of training of computing specialists in Europe'.

Objectives for the project

The objectives stated in the original proposal were to cover a 36 month period and were to:

1. Create a Thematic Network
2. Create a model Virtual European Department of Computing (VEDoC)
3. Create Virtual Recommended Professional Standards
4. Create Virtual Recommended Curricula and Syllabi
5. Extend the European Credit Transfer System (ECTS) and the System for Quality Control
6. Create an open and distance training network
7. Create a Virtual Library in Computing
8. Create a Virtual Centre for developing teaching materials
9. Create a European Computer Education Association
10. Participate in dissemination activities including conferences, seminars, round tables, ECET Journal
11. Evaluate work internally and externally

The first stage of the project agreed objectives as:

1. Establish the framework for the Thematic Network
   - Create the means and systems for communication amongst the Network
   - Outline processes and representatives for the project activities
2. Establish the VEDoC infrastructure
3. Prepare Virtual library Structure
4. Consider Virtual Centre for developing teaching materials
5. Create Virtual Recommended Curricula and Syllabi
6. Hold conference to discuss the Thematic Network in respect of ICTs and the e-Learning Initiative
7. Establish means to expand the Thematic Network with partners from each member country
8. Prepare continuation bid, reports and workplans for subsequent project stages

These objectives were outlined and discussed at the first project meeting in Rousse in March 2002. The next sections of this report will outline more specific comments on objectives, processes and outcomes.

Project Management Achievements

The project's first stage objectives represent a well-planned approach. The objectives were laid out with a time plan and responsibilities indicated. This information was outlined and distributed to all project partners, with some opportunity given for discussion. Project management is thus well-established.

These objectives have broadly been met. In this respect the project is on target. Four main project meetings have been held, in Rousse, Bulgaria; Sofia, Bulgaria; Larnaka, Cyprus; and Vienna, Austria. A framework has been established with familiarisation achieved by partner members of the backgrounds and approaches which characterise each member country's educational practices in Computing. Shared understanding is developing, with each discussion exploring approaches and the outlining of differences and similarities in member's practices, opportunities and constraints. Early activities are recommended in the next stage to complete scooping of the work tasks and investigation of objectives in these respects.

The project partners have been identified with very few changes to the original set proposed.

Project Infrastructure

Web-site

The project has set up a web-site and proposed means of communication for project members. Basic communication mechanisms have been established with evidence of use and communications to, from and between project members.

The project recognises that individual members are drawn from differing environments across Europe. Clear information as to the flexibility needed to support project members infrastructure is needed. Testing of the site needs to

continue to ensure that technological flexibility is fully supported. For example various browsers should be enabled and each function as optimally as others in accessing the site.

In view of the variety of languages present amongst members the decision to support English and German on the web-site in the first instance should be reviewed and the languages supported by the site re-considered. Reviewing the size and scope of this problem should ensure wider access to the web-site and its learning materials provision.

Further work to ensure that the site is set up to enable development to include more powerful tools to support communication between individual members is recommended. Tools to support a more structured and accessible management of contributions to discussions would be particularly welcomed by project members.
Virtual Library Structure

The principle of sharing of resources has been enacted within the project site and a Library Structure proposed. Further discussion is now needed to determine the direction of development, for example the scope and the access links to materials in the library need to be clarified, to ensure that this a vehicle for staff to share best practice. Project members have specifically identified that they wish to access materials relating to teaching and to supporting staff in development of best practice, rather then just sharing access to course content. Project members have agreed to assist specifically with development of access to the many sites now available which provide this type of material.

Learning Materials development

A shell for developing learning materials has been developed. This is still at an early point for the project.

At this time many project member institutions are actively developing their own learning environments, or producing materials for proprietary systems for the technological support of learning such as Blackboard, WebCT etc. The project needs to consider ways to build positively on existing work of this kind as far as possible. Interoperability and migration of material across environments needs to be investigated, developed and evaluated. In this way potential will be built upon and compatibility assisted in the development of a virtual European Department of Computing. This will help to meet the project's aim and enable fuller contribution from members.

Mechanisms to facilitate the integration of these valuable experiences will be needed at all stages of the project, with clear approaches and methods adopted to evaluate and consider incorporation where appropriate. Subsequent stages of the project may need to consider seeking contributions from a corporate environment developer contributor to assist in accomplishing this.

Learning Materials models for virtual centre for preparing teaching materials

Early examples of learning materials are available on-line on the project web-site. The extent to which questions of learning methods, the learning styles supported on the site and models for on-line learning are to be addressed as the project develops, is a major consideration for subsequent years of the project. A staged and layered approach to developing the curriculum and models of practice is recommended. Expertise is available from within the project team to provide specific support in this area and an early review of approaches to determine models to adopt would be beneficial.

Further development of the site to ensure it meets with legislation covering access and use relating to users' learning needs is required, this will ensure use of sound development principles for the site to ensure access by users with different learning needs and styles.

Work of subject groups, Work of subject areas

The subject groups have been established. The groups are based on wide membership of the project and have undertaken work to promote definitions for curricula and professional standards at undergraduate and postgraduate levels.

Subject scope

Considerable differences of emphasis exist in curricula across project members. The autonomy of the individual partners is recognised in maintaining their own institutional or national view on the scope and activities undertaken within the various Computing qualifications to be found in each participating country. This remains a key consideration as a principle for the project, with a staged and layered model of curriculum promoted. The statements on curricula and standards must best be regarded currently as recommendations deletion and further consideration given to validating these to ensure that terms are clear and that scope and content is complete.

Large group discussions to formulate these were undertaken in the later meetings during the year. It is recognised that the project member population is sufficient to refine the framework further still. Documenting the range of National perspectives may be a helpful next step.

Comparable standards

It is recognised that many National initiatives to review standards and threshold levels across curricula have used statements based on 'learning outcome' models. A clear framework would be helpful to enable comparisons to be made between the project and contemporary work undertaken elsewhere. Reviewing these practices will develop the framework into more robust structures and support the project in meeting its objectives for an outline curriculum. The work of the project also needs to be aware of the implications of the Bologna agreement.

External stakeholders

Additionally time could be spent in considering whether other, non-academic stakeholders could be included, and how these project recommendations might be tested against the views of other stakeholders such as:

- Industrialists
- Professional bodies
- National subject / discipline centres
- Extended partner institutions.

Specific involvement of professionals from industry or professional bodies might be considered.

Discipline of Computing

Across Europe the Computing discipline is acknowledged to be a broad one. Some national initiatives have recognised this and offer an outline statement of coverage to embrace the breadth of activity from computer engineering to information management practices including all analysis and development activities in between. Significant variations exist in the way in which the discipline of computing is understood and expressed, and in existing educational and training practices. Management approaches and governance of Universities also provide evidence of clear cultural differences and constraints.

Opportunity to discuss these further will be needed in order to enable all project members to fulfil their potential contributions to the project. Project management may have to be very sensitive to recognise the context in which project members work at their individual institutions. Discussion with members is needed to determine the most effective methods to ensure that all constraints and potential areas of difficulty in meeting objectives are shared and outlined as early as possible in the second stage of the project.

Virtual Department of Computing

Discussion is underway concerning the structure and approaches to address in order to develop further this aspect of the work of project members. This is recognised to be an ambitious step, with many supporting activities and mechanisms to be considered. The project members are aware of the issues to address and are actively considering ways to advance this area of the work.

Many of the developments suggested elsewhere in this document support the work of the Virtual Department. Progress towards achieving this aim will be more appropriately evaluated later in the project.

Overview

Given the delayed start and the wide variety of national and institutional practice and experience represented by the project partners, a sound start has been made. A sound project infrastructure has been established, on which further developments

can be based. A clearer understanding of both the differences of practice and the commonality of purpose of the members of the project has been achieved and a willingness to co-operate in moving the project forward is evident.

October 02
UK

EVALUATION REPORT

by Dr. Rumen Pranchov, Assoc. Professor
Director of Higher Education Directorate
Ministry of Education and Science
Bulgaria

Thematic Network 213871-CP-1-2001-1-BG-ERASMUS-TN
"EUROPEAN COMPUTING EDUCATION AND TRAINING"

In 2001 Erasmus Thematic Network European Computing Education and Training was started. The coordination and management of the project has been assigned to the Department of Computer Systems and Technologies at the University of Rousse, which is its initiator and author and in addition has a significant experience in managing large international projects. 56 departments from 31 European countries participate in the TN. This is a very large project and the only one in which Bulgarian higher education establishment is a coordinator.

Being computer education and training project all activities are easy to follow through its web site.

The following main results, achieved by the consortium during the first project year, can be pointed out:

- Actual establishment of the consortium and creating the project infrastructure;
- Development of comparable professional standards for Bachelors and Masters in:
  - Computer Science;
  - Computer Engineering;
  - Software Engineering;
  - Information Systems.
- Elaboration of comparable curricula for Bachelors in the above-mentioned programmes;
- Carrying out a survey with the aim of getting a feedback from companies in the field of computing, processing and summarizing the survey results;

- Creating a model of a WEB based laboratory;
- Creating a model of a WEB based course;
- Developing a virtual centre for implementation of WEB based teaching materials and courses;
- Establishment of Virtual European Department of Computing;
- Organizing and conducting an International Conference on Computer Systems and Technologies (e-Learning) with a stress on the problems of e-Learning and publishing the Conference Proceedings;
- Conducting a large-scale campaign to publicize the outcomes of the project work;
- Attracting new partners to the network.

The virtual education system elaborated is a very impressive one. It is typical “Third Wave” organizational approach to the computing higher education and training.

The results, achieved during the first project year, must be given a high assessment. If the project activities will follow the work plan, there is no doubt the final objectives will be achieved.

28.10.02.
Sofia, Bulgaria

Thematic Networks
213871-CP-1-2001-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(TN ECET)

F I N A L R E P O R T
FOR THE FIRST YEAR
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