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.

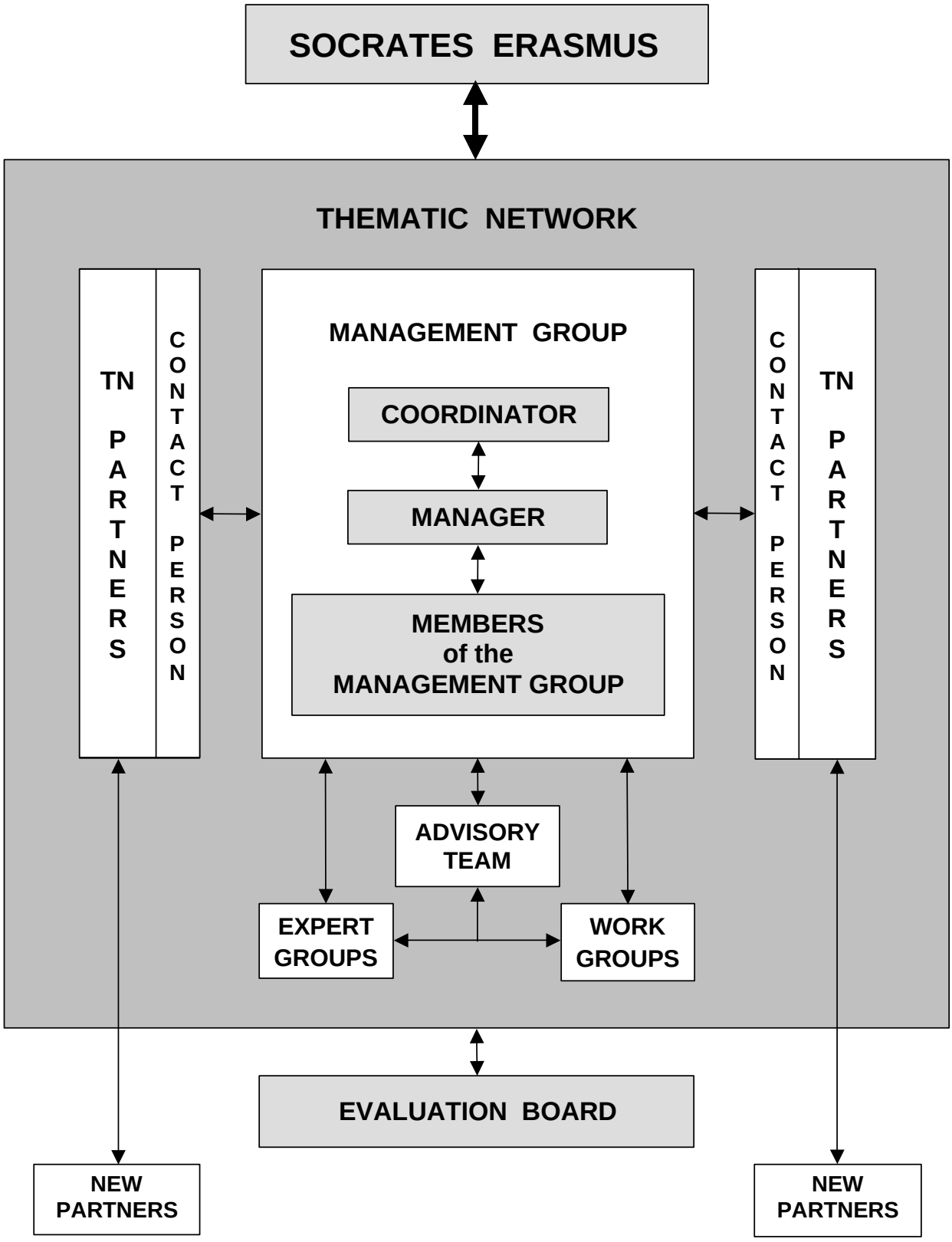
Another major motive comes from the following. According to forecasts by many specialists the 21st century will be an **Information Technology Century**. It is expected that new Information and Communication Technologies will enter absolutely every area of human activity – material as well as mental, 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 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 is being established on the principle of good will and is 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

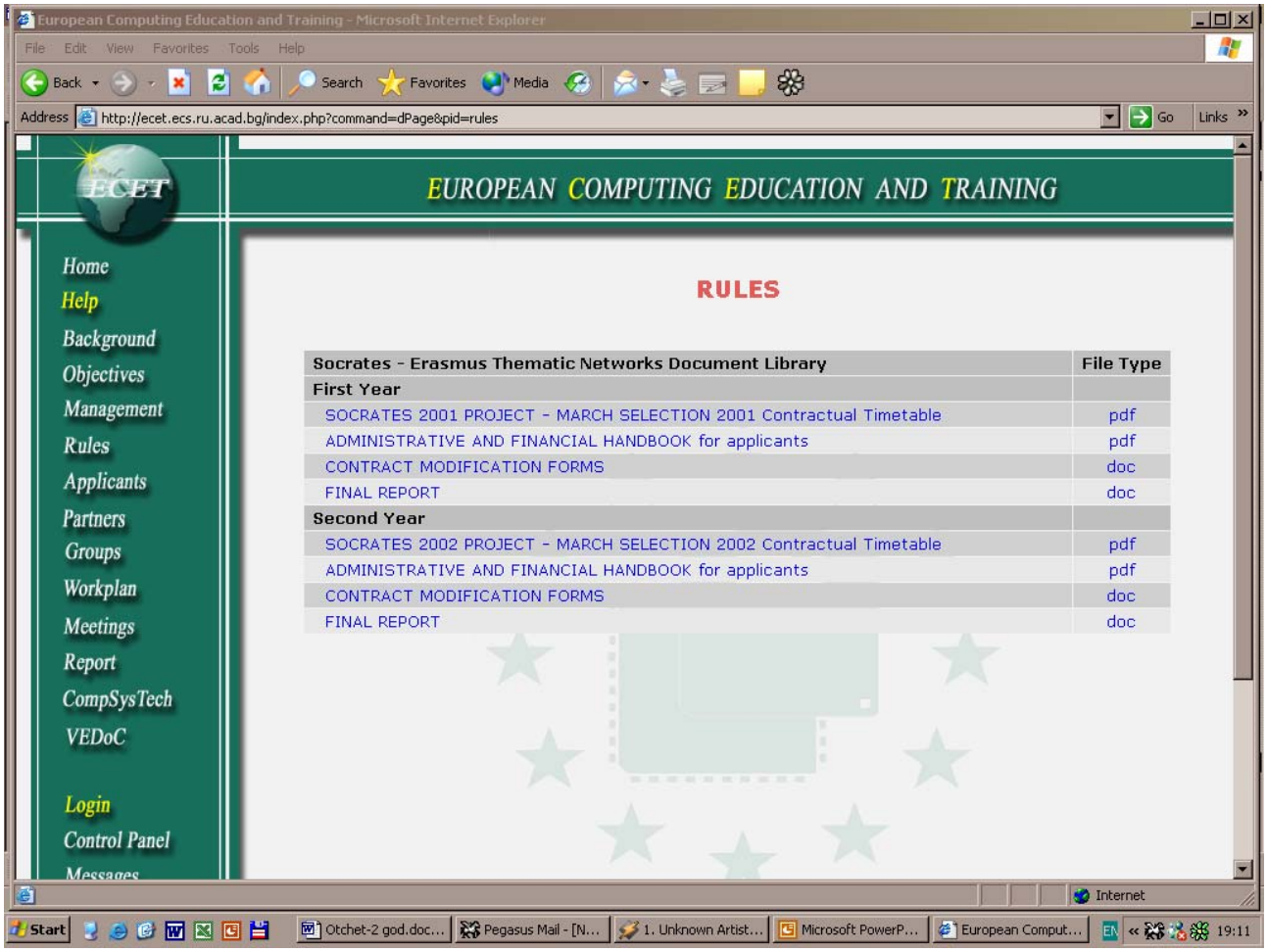
1. Establishing the Thematic Network **E**UROPEAN **C**OMPUTING **E**DUCATION and **T**RAINING (**ECET**) - at the end of the third year the number of departments and organisations included in the network has to reach 150.
2. Establishing a model **V**IRTUAL **E**UROPEAN **D**EPARTMENT of **C**OMPUTING (**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

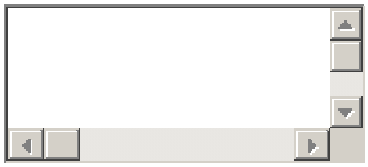
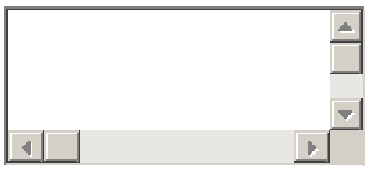
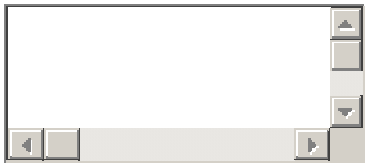
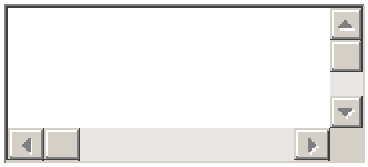
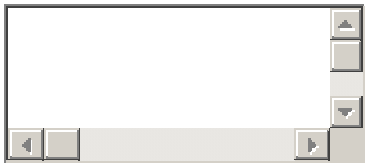
The working rules, to which all Thematic Network members must stick, are formulated by DIRECTORATE-GENERAL EDUCATION AND CULTURE at the EUROPEAN COMMISSION and are published on the project web site.



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
ASL in CST
Bulgarian Association of Information Technology (BAIT)
Bulgarian Branch Association of Electronic Industry and Informatics (BBAEII)
Bulgarian Academy of Sciences - Central Laboratory for Parallel Processing
IEEE Bulgaria Section
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
National Institute of A. S., Rennes
UVSQ

9. Germany
Artur Speer Akademie
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
Palermo University

15. Latvia
Riga Technical University

16. Liechtenstein
University of Applied Sciences Liechtenstein

17. Lithuania
Kaunas University of Technology
Vilnius Gediminas Technical University
Vytautas Magnus University

18. Malta
University of Malta

19. Norway
Norwegian University of Science and Technology

20. Poland
Warsaw University

21. Portugal
Coimbra University

22. Romania
Academy of Economics Studies Bucharest
University of Pitesti

23. Slovenia
University of Ljubljana
Nova Gorica Polytechnic

24. Spain
Polytechnic of Madrid
University of La Laguna

University of Malaga
Polytechnic of Valencia

25. Sweden
University of Gävle
Växiö University

26. The Czech Republic
Czech Technical University in Prague
University of Ostrava

27. The Netherlands
Eindhoven University of Technology
Hogeschool Rotterdam

28. The Slovak Republic
Comenius University of Bratislava
Slovak University of Technology
University of Constantine the Philosopher, Nitra

29. Turkey
Bilkent University
Middle East Technical University
Kocaeli University

30. 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 2002 / 2003

No	Activity	Responsible	Date
1.	Elaborating the TN Workplan for 2002/2003.	Rousse University	30.09.2002
2.	Submitting a proposal for financing the TN in 2003 / 2004.	Rousse University, Contact Persons	28.02.2003

3.	Developing comparable curricula for the Master of Computing degree course:
	• Study and analysis of existing curricula;
	• Organising virtual meetings of the separate Expert groups with the purpose of:
	  • Analyses of existing curricula;
	  • Developing comparable curricula for Master.
		Rousse University, AT, EGs	30.10.2002

4.	Organising a virtual round table to discuss the curricula.	MG, AT	30.11.2002

5.	Development of comparable syllabi for the Bachelor and Master of Computing degree course:
	• Study and analysis of existing syllabi;
	• Organising virtual meetings of the separate Expert groups with the purpose of:
	  • Analyses of existing syllabi;
	  • Developing comparable syllabi.
		EGs	30.06.2003

6.	Strengthening and developing the Virtual European Department of Computing.	MG, AT	
7.	Opening a Virtual Centre for Preparing WEB based Courses: • Development of WEB based courses for the main courses of the comparable curricula; • Including the developed courses in the Virtual Library.	MG, AT, EGs, WGs	30.09.2003
8.	Introduction of the ECTS and SQC. • Extension of the ECTS • Developing criteria for evaluating quality of teaching.	EGs, WGs	15.03.2003
9.	Organising and conducting an international conference on Computing.	Rousse University, MG, EGs, WGs	30.06.2003
10.	Participation in organising and conducting the 4-th Annual Conference of the LTSN-ICS.	University of Ulster MG, EGs, WGs	31.08.2003
11.	Participation in organising and conducting a Spring Conference in Computer Graphics.	Slovak University of Technology MG, EGs, WGs	31.04.2003
12.	Publishing Conference proceedings – both paper and electronic.	Coordinator	31.08.2003
13.	Attracting 30 new members of the TN – about 1 for each partnering country.	All Partners	30.09.2003
14.	Informing the public about the project work results by means of regional and national mass media.	All Partners	Continuous

15.	Preparing a report about project work results in the second year.	Rousse University, Contact Persons	15.09.2003
16.	Establishing of EUROPEAN COMPUTER EDUCATION ASSOCIATION (ECEA): • Establishing and developing links with national and international associations in the field of Computing; • Developing links with the Institute of Electrical and Electronics Engineers (IEEE) Computer Society and its European chapters; • Developing links with the Association for Computing Machinery (ACM) and its European chapters.	MG Society and Associations	30.09.2003
17.	Conducting a round table on computing education	TU-Sofia Contact persons	30.09.2003
18.	Convening a MG Meeting with the purpose of: • Discussing and adopting the report; • Evaluating the completed work; • Making a decision about establishing a ECEA; • Discussing and adopting the Workplan for 2003 / 2004.	Rousse University, Contact Persons EB	30.09.2003

Meetings

MINUTES
and
MAIN RESULTS
of the
MEETING
held on 18 to 22 June 2003 in Sofia

In this First Meeting **42 representatives of 17 European countries** took part, including Greece, Spain, Ireland, the Nederland, Austria, Portugal, UK, Lichtenstein, Island, Bulgaria, Czech Republic, Estonia, Cyprus, Lithuania, Poland, Romania, Slovak Republic.

All participants in the meeting were present at the CompSysTech'2003 conference, whose organization is included in the work plan of TN ECET for the second year. In the CompSysTech'03 conference 138 Bulgarian and 29 foreign scientists took part.

The conference was opened with an address of the Minister of Education and Science (MES), presented by Prof. Dr. Rumen Pranchov - Director of the Directorate "Higher Education" at the MES. The participants in the conference were also welcomed by Dr. Vanev – President of the Management council of the Union of Automation and Informatics, as well as by Mr. Kuzov – Director of the ICT Development Agency.

During the plenary session four papers were presented:
- John Atanasoff - Inventor of the first Electronic Digital Computer
- Virtual Learning Environments: Towards Next Generation
- IT in Education - the Indispensable Investment in the Future of Bulgaria
- Virtual Department of Computing "John Atanasoff" – State and Trends

The rest of the papers totaled 128, and were distributed in 5 sections as follows:
1. Computer Systems (Hardware) – 13 papers.
2. Computer Systems (Software) – 29 papers.
3. Application aspects of computer systems and technologies – 29 papers.
4. A. Application aspects of computer systems and technologies – 24 papers.
5.Educational aspects of computer systems and technologies – 33 papers.

During the conference a Work Shop for PhD students took place on ”Network Algorithms”. Its main lecturer was Prof. Dr. Michael O hEigeartaigh.

In the end, in each of the five sections, the authors of the most interesting and well presented papers as well as the best young scientists and PhD students were given awards of the ACM (USA), whose Bulgarian chapter is a co-organizer of the CompSysTech conference.

On 21 June a TN project meeting was conducted with the following agenda:

- Introduction of participants in the meeting.
- Report about completed work.
- Discussion.
- Discussing and adopting the curricula for Masters Degree in Computer Science, Computer Engineering, Software Engineering, Information systems.
- Discussing and adopting the course syllabus structure.
- Specifying future activities.
- Discussion.
- Clarifying some of the financial rules for project work.
- Any other business.

MINUTES
and
MAIN RESULTS
of the
FINAL MEETING
held on 01 to 02 September 2003 at the FHTW – Berlin, Germany

In the Final Meeting **78 representatives from 54 institutions of 27 European countries** took part, including Belgium, Denmark, Germany, Greece, Spain, France, Ireland, Italy, the Nederland, Austria, Portugal, Finland, Sweden, UK, Island, Norwegian, Bulgaria, Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, Slovak Republic.

The meeting was opened by Professor Wladimir Bodrow, who welcomed the participants on behalf of the President of FHTW Berlin Professor Herbert Grüner.

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 Prof. Rumen Pranchov, Director of Higher Education Directorate in the Ministry of Education and Science.

- Discussions took place on the coordinator's report as well as on the opinion of the Evaluator.

- Specifying the activities until the end of the second year.
- Discussion

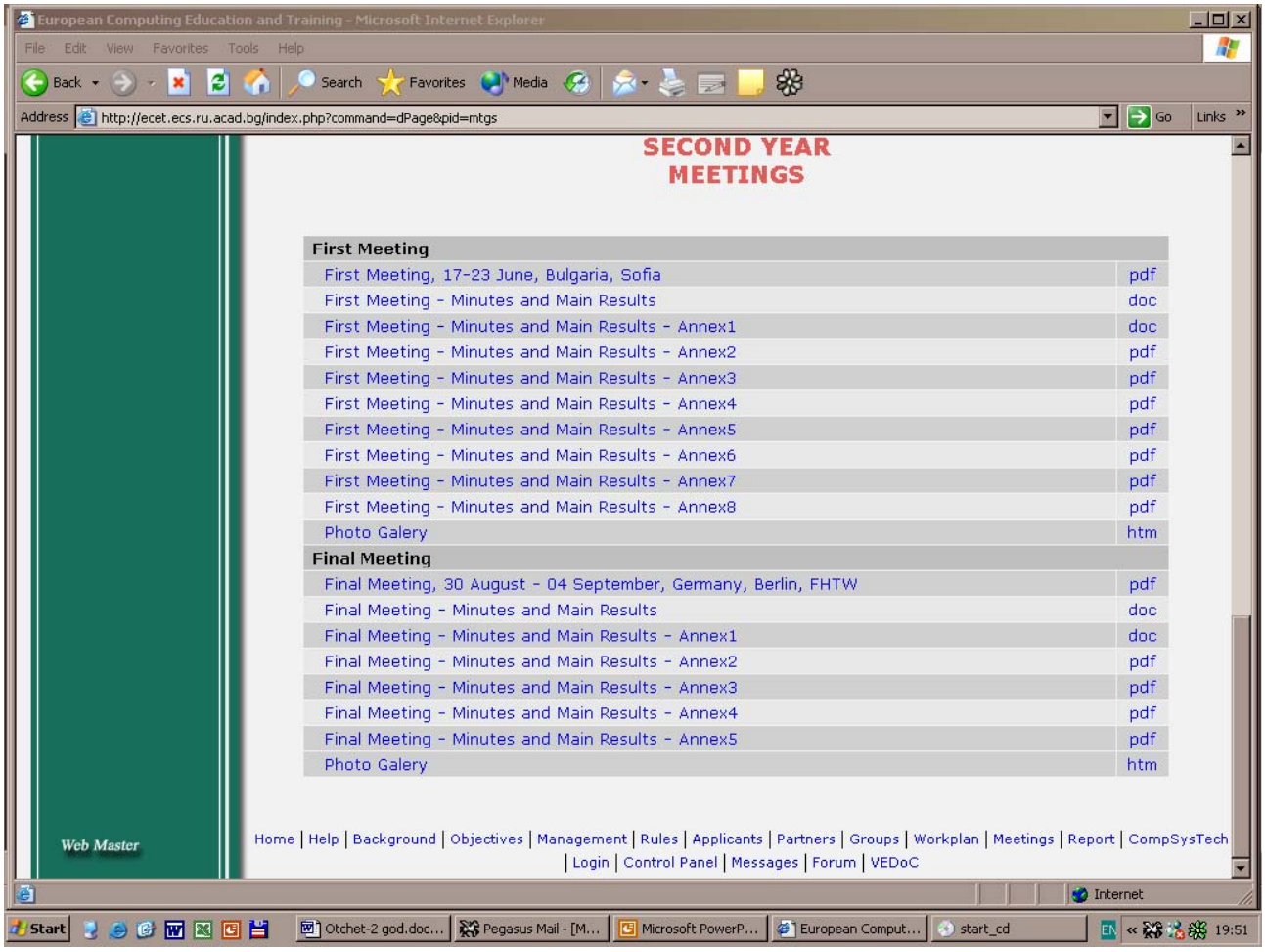
During the second session mainly financial issues were discussed. The project manager reminded about the main project financial rules and the way of preparation of financial documents. A decision was made that by 30/09/2003 each partner has to send filled in financial appendices by email for check, and by 20/10/2003 – the final report by registered mail.

During the third session the following issues were discussed and adopted:

- Demonstration of the ECET WEB site.
- Demonstration of the VEDoC WEB site.
- Demonstration of the Virtual Centre for Preparing WEB based Courses (e-Learning Shell) and of the Virtual Library.
- Demonstration by project partners about development and application of environments for virtual teaching materials, virtual laboratories, etc. for the purposes of e-Learning.

- Discussing and adopting a proposal for a Work plan for 2003/2004.

For more Information see ECET WEB site: http://ecet.ecs.ru.acad.bg/



Report
for 2002 / 2003

1. A detailed Work Plan for 2002/2003 was drawn up and has been acted on.
2. A proposal for financing the Network during 2003/2004 has been written and sent to the Socrates Office in Brussels.
3. The WEB site of TN ECET is continuously updated. All developed materials are uploaded on the project web site on time for discussion.
4. Using the forum of the Project web site Virtual meetings of the separate Expert groups have been organized with the purpose of analyses of existing curricula and developing comparable curricula for the Master of computing.
5. Four comparable Master curricula have been developed for the following programmes:
   - Master of Computer Science;
   - Master of Computer Engineering;
   - Master of Software Engineering;
   - Master of Information Systems.
6. Using the forum of the Project web site a virtual round table has been organised to discuss the curricula.
7. Using the forum of the Project web site Virtual meetings of the separate Expert groups have been organized with the purpose of analyses of existing syllabi and developing comparable syllabi for the Bachelor and Master of computing.
8. The following comparable syllabi have been developed:
   - Syllabi for a Bachelor of Computer Science - 30;
   - Syllabi for a Master of Computer Science - 20;
   - Syllabi for a Bachelor of Computer Engineering – 30;
   - Syllabi for a Master of Computer Engineering – 20;
   - Syllabi for a Bachelor of Software Engineering – 30;
   - Syllabi for a Master of Software Engineering – 20;
   - Syllabi for a Bachelor of Information Systems – 30;
   - Syllabi for a Master of Information Systems – 20.
9. Two Collections with Professional Standards, Curricula and Syllabi have been published:
   - Bachelor of Science in CS, CE, SE, IS;
   - Master of Science in CS, CE, SE, IS.
10. The Virtual Centre for Preparing WEB based Courses, e-Learning Shell (eLSe), has been further developed and is being used in 11 Bulgarian Universities and the Comhard company in Berlin.
11. 23 web based courses of the comparable curricula have been developed and included in the Virtual Library.
12. The Spring Conference in Computer Graphics has been conducted. During the conference a meeting of the Expert group of Visualisation & Multimedia took place.
13. The CompSysTech'2003 conference was held in Sofia, Bulgaria, with a wide participation of members of the TN consortium. 138 Bulgarian and 29 foreign scientists took part in the conference. There was a special "e-Learning" section dedicated to the role of the TN in the development and application of

Information and Communication Technologies (ICTs) and in the e-Learning initiative of the European Commission.

14. During the conference a Work Shop for PhD students took place on ”Network Algorithms”. Its main lecturer was Prof. Dr. Michael O hEigeartaigh.
15. CompSysTech’2003 conference proceedings have been published in a paper version and as a CD.
16. The First TN project meeting took place in Sofia in association with the CompSysTech conference on 21 June 2003, and 42 representatives from 17 European countries took part. The following activities were completed at the meeting:
    - A Report about completed work.
    - Discussing and adopting the curricula for Masters degree in Computer Science, Computer Engineering, Software Engineering, Information systems.
    - Discussing and adopting the course syllabus structure.
    - Specification of future activities.
    - Clarification of the financial rules for work on the project.
17. Introduction of the ECTS and SQC. For this purpose ECTS Information packages have been prepared. The partners from Liverpool John Moores University developed the material SQC issues for ECET, which was distributed among all partners for discussion. The number of the Bilateral Agreements for student exchange under the SOCRAT/ ERASMUS programme has increased.
18. The 4-th Annual Conference of the LTSN-ICS has been organised and conducted with the participation of TN ECET.
19. The government and the public in Bulgaria are regularly informed about the objectives, activities and results of the TN ECET by means of regional and national mass media.
20. A report on the work carried out during the second year of the project has been elaborated.
21. A Work Plan for the year 2003 / 2004 has been prepared.
22. The final meeting for the second project year took place in Berlin on 1-2 September 2002. It was hosted by FHTW-Berlin and 88 representatives from 53 institutions in 27 European countries took part. The following activities were completed at the meeting:
    - The second year report was discussed and adopted;
    - The work completed in the second project year was evaluated;
    - The Work Plan for 2003 / 2004 was discussed and adopted;
    - Demonstrations by project partners about development and application of environments for virtual teaching materials, virtual laboratories, etc. for the purposes of e-Learning took place.
23. The SAER-2003 conference was held in Varna, Bulgaria on 19 – 21 September 2003. During the conference a round table discussion on Computer Systems in Education was conducted.

A N N E X 1

Collection with Professional Standards, Curricula and Syllabi for Bachelor of Science in CS, CE, SE, IS

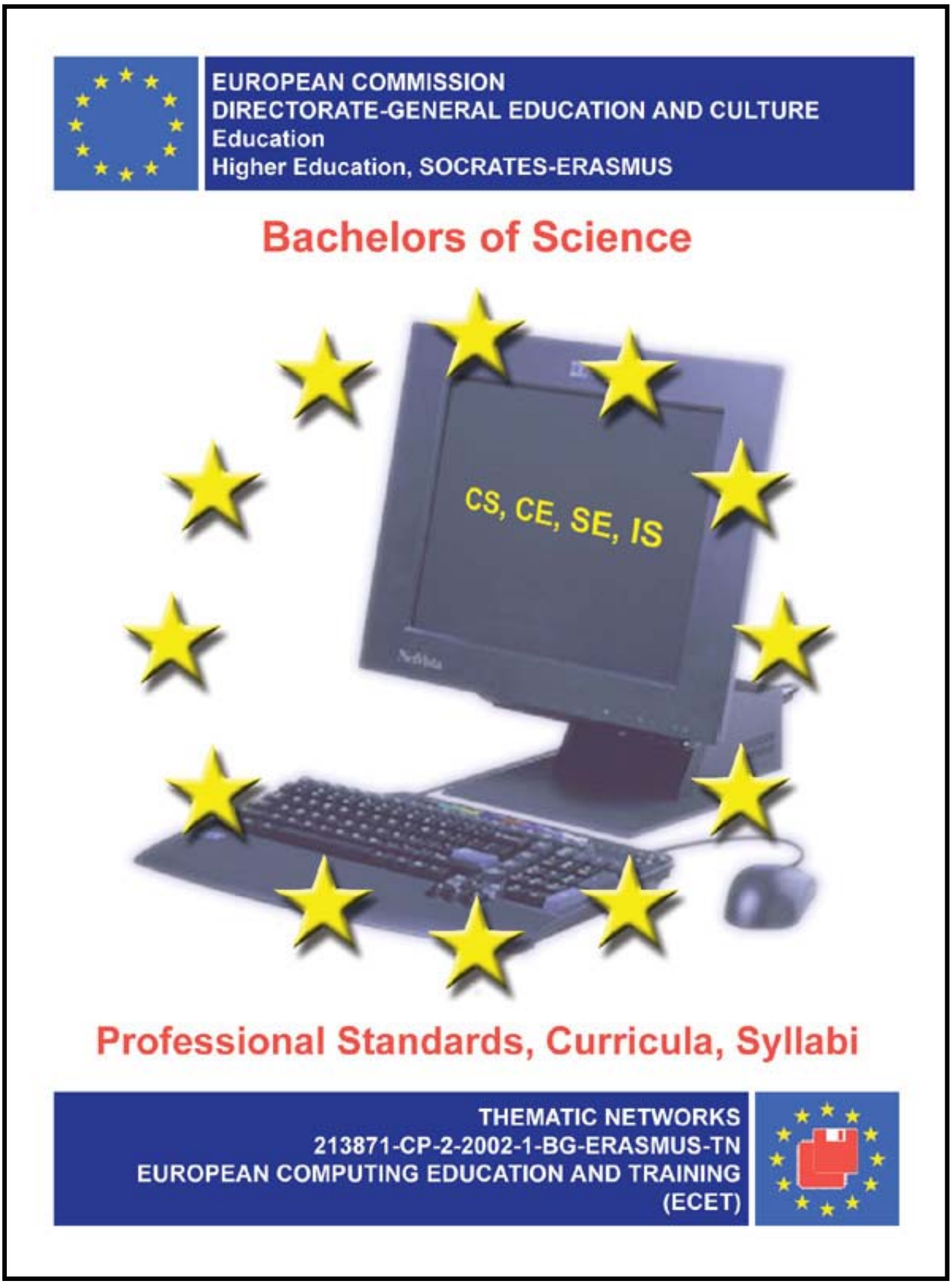


TABLE OF CONTENTS

Collection with Professional Standards, Curricula and Syllabi for Master of Science in CS, CE, SE, IS

EUROPEAN COMMISSION
DIRECTORATE-GENERAL EDUCATION AND CULTURE
Education
Higher Education, SOCRATES-ERASMUS

Masters of Science

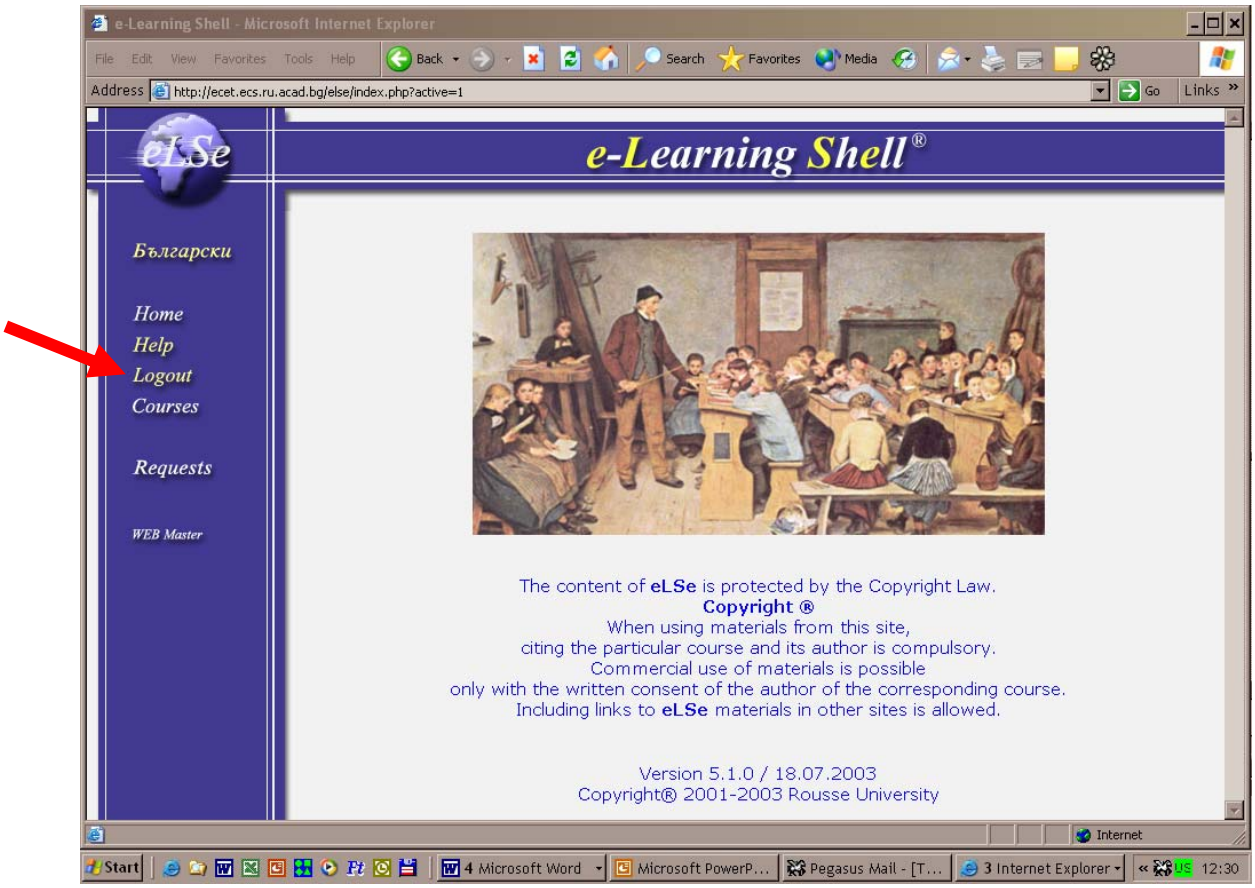
Professional Standards, Curricula, Syllabi

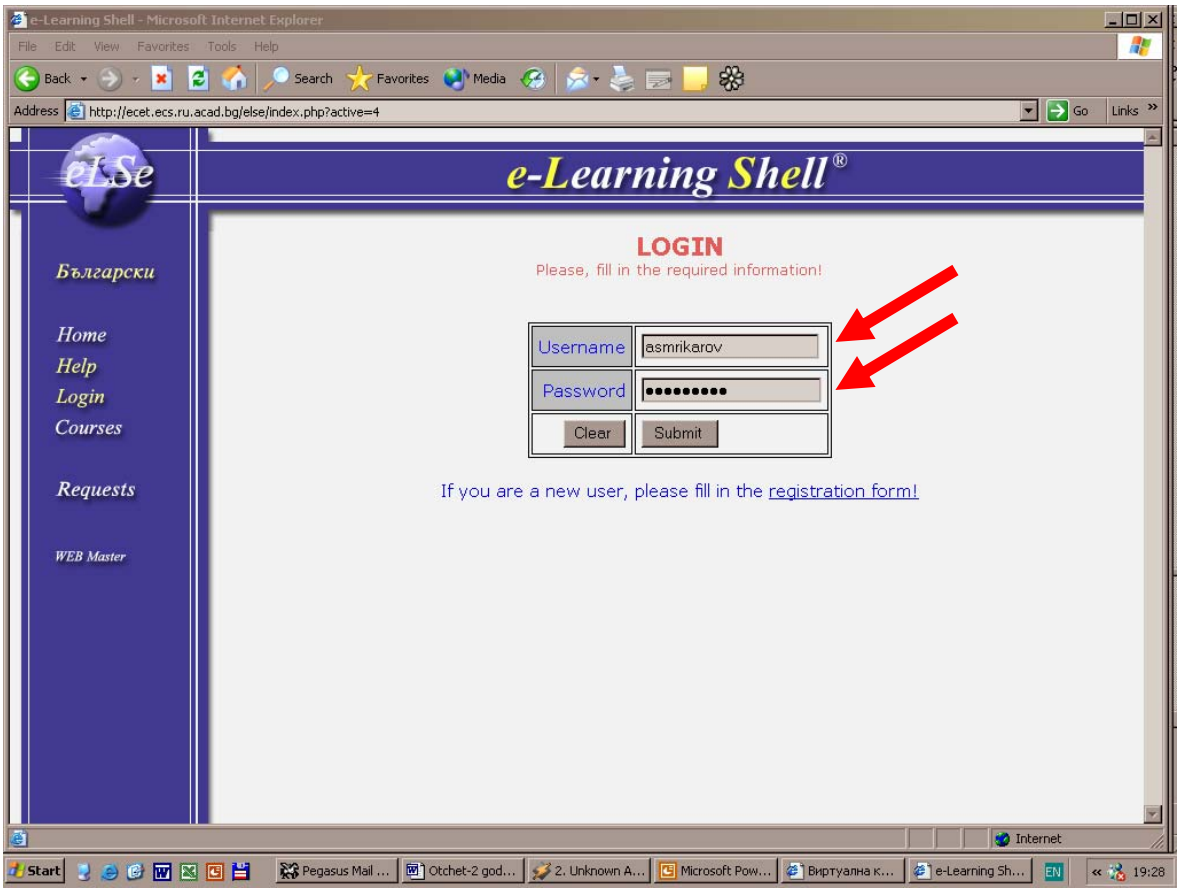
THEMATIC NETWORKS
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

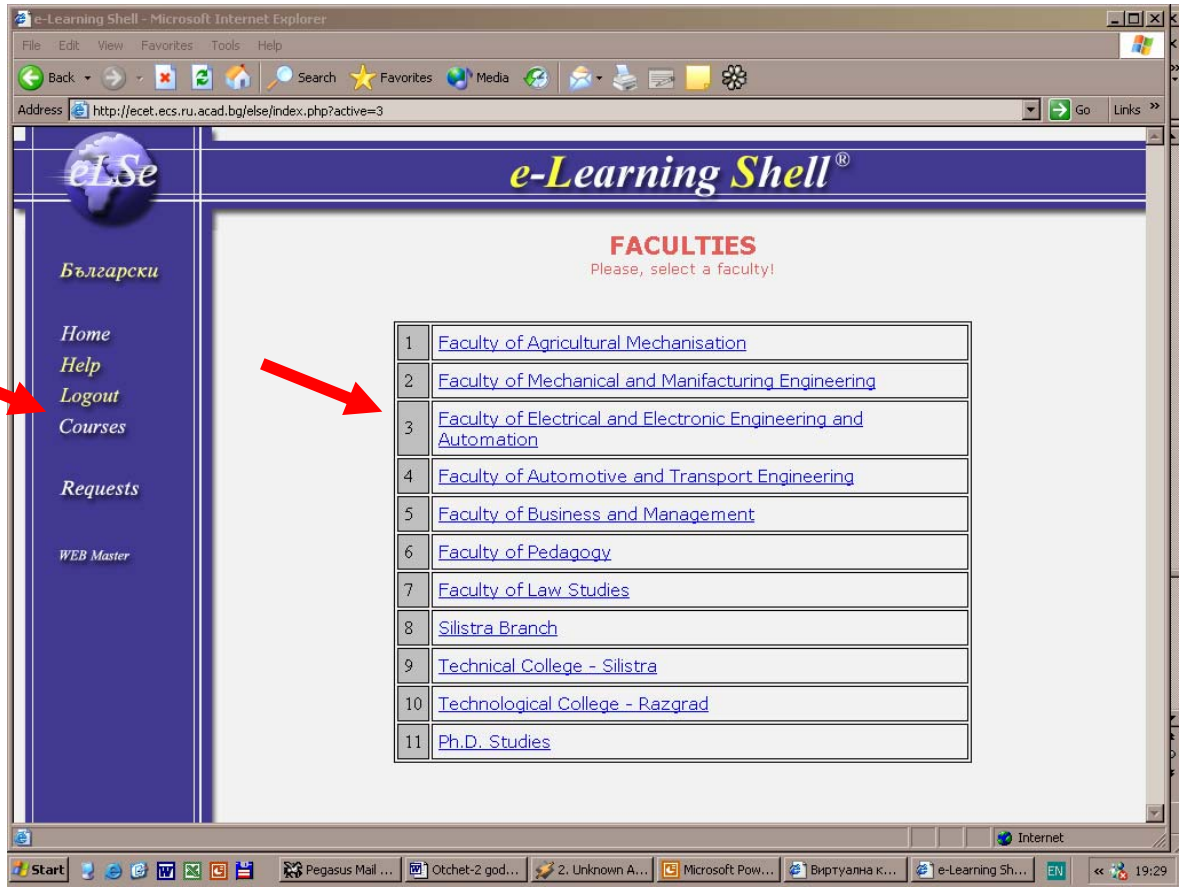
TABLE OF CONTENTS

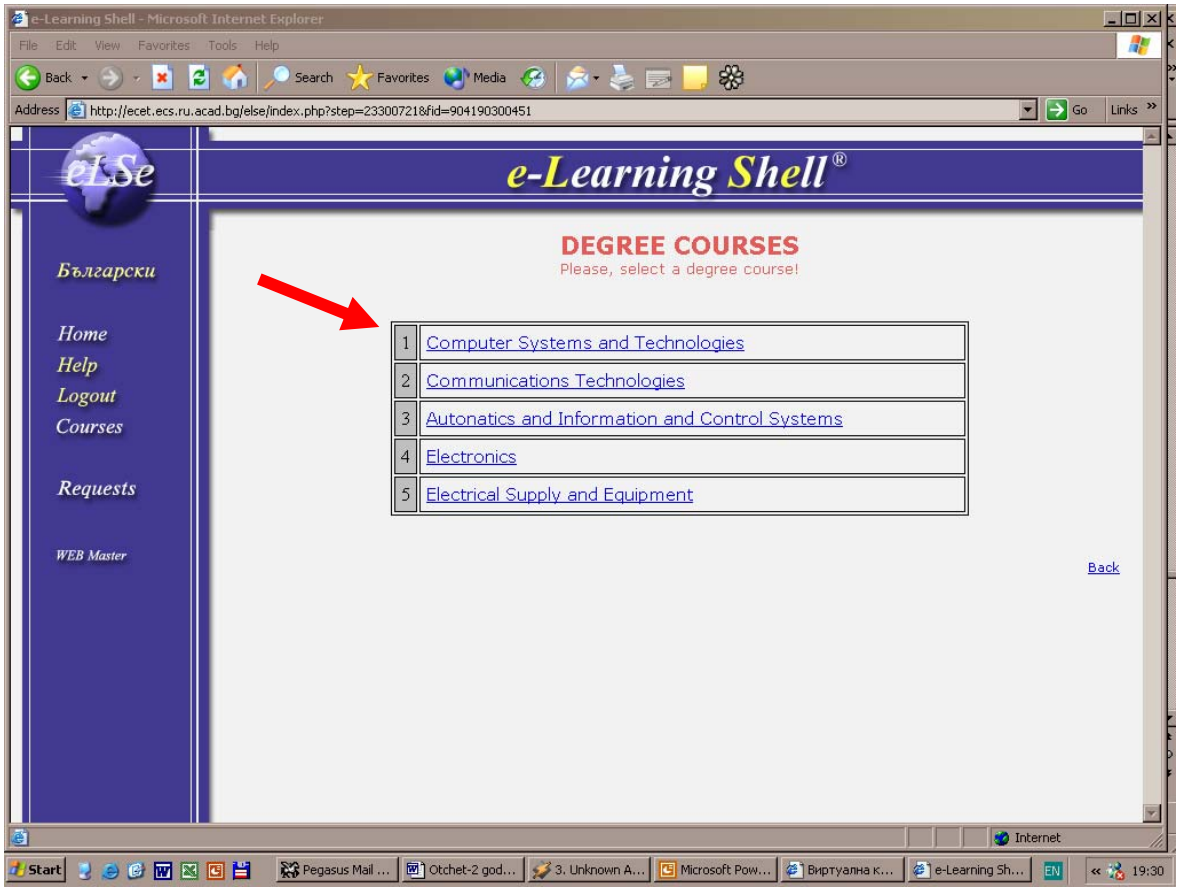
A N N E X 2

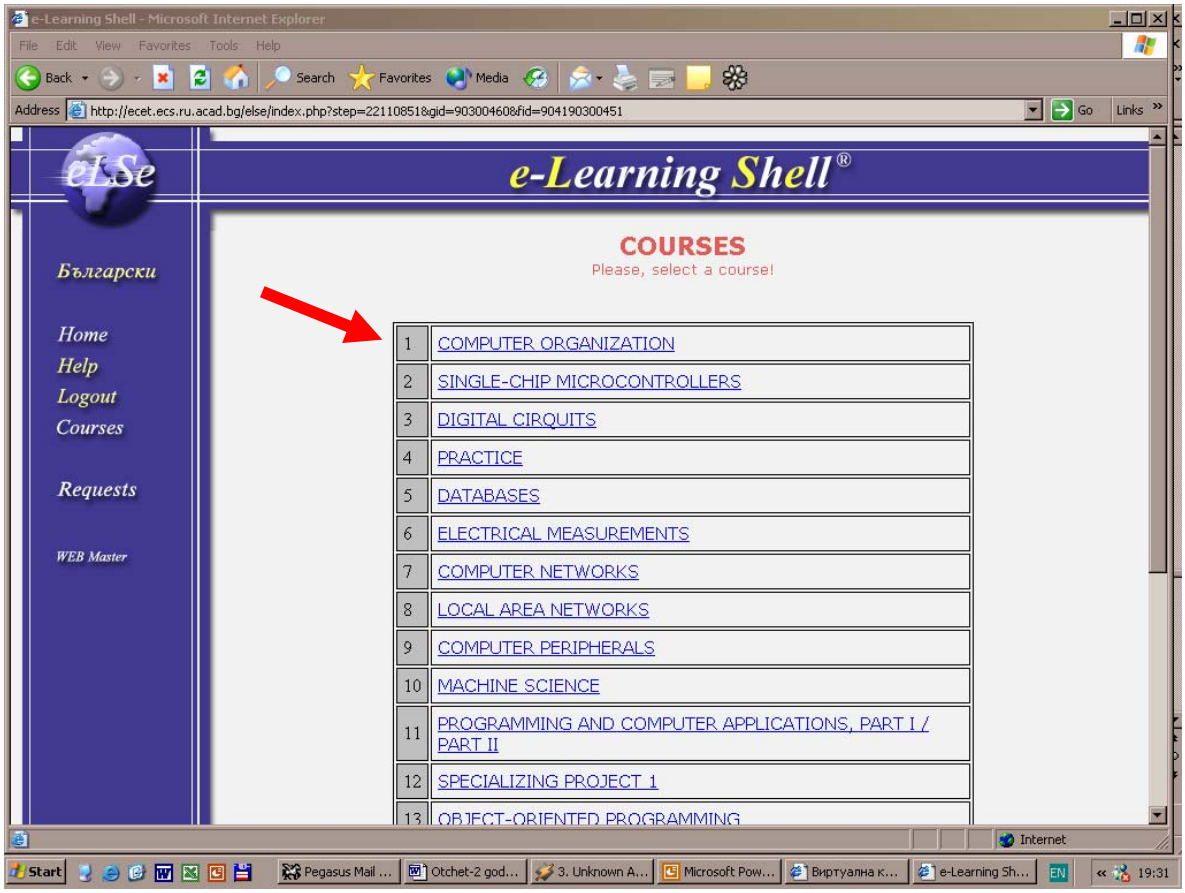
Virtual Centre for Preparing WEB based Courses

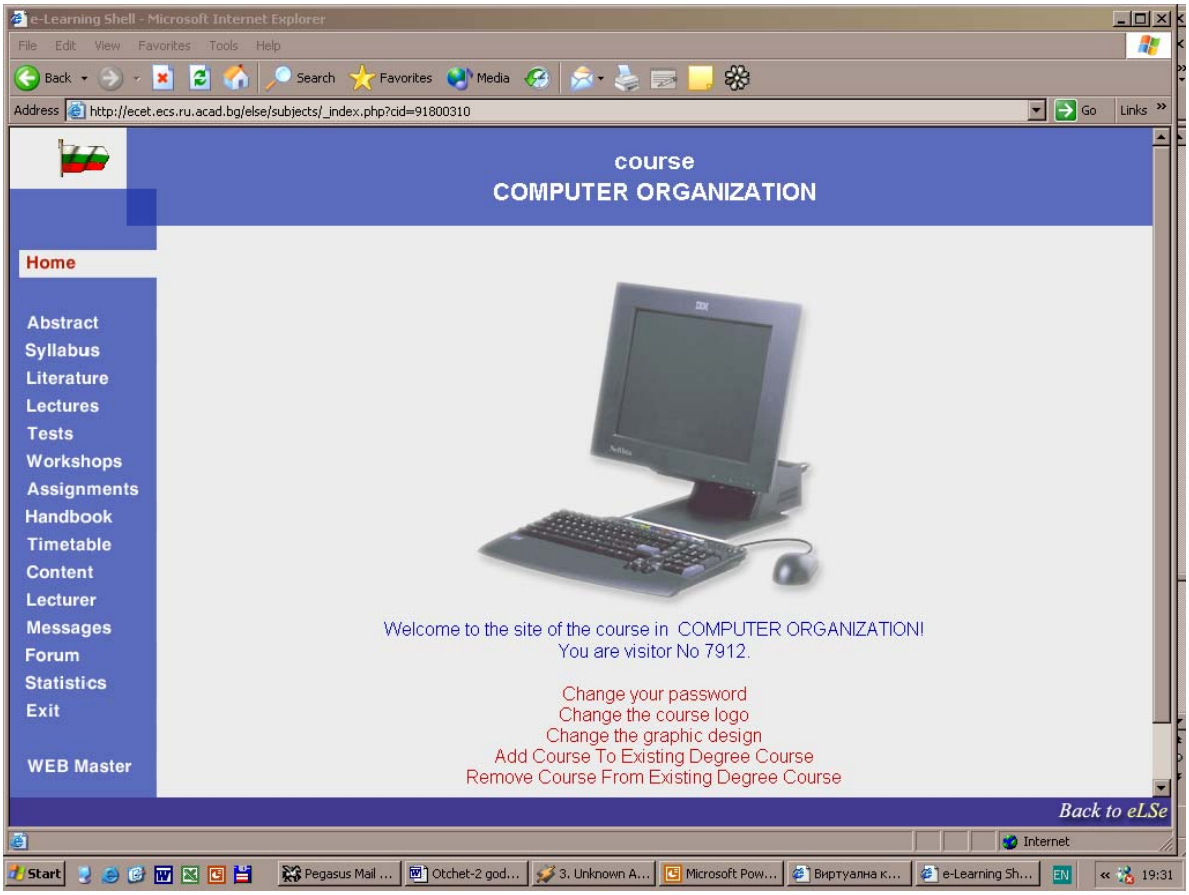




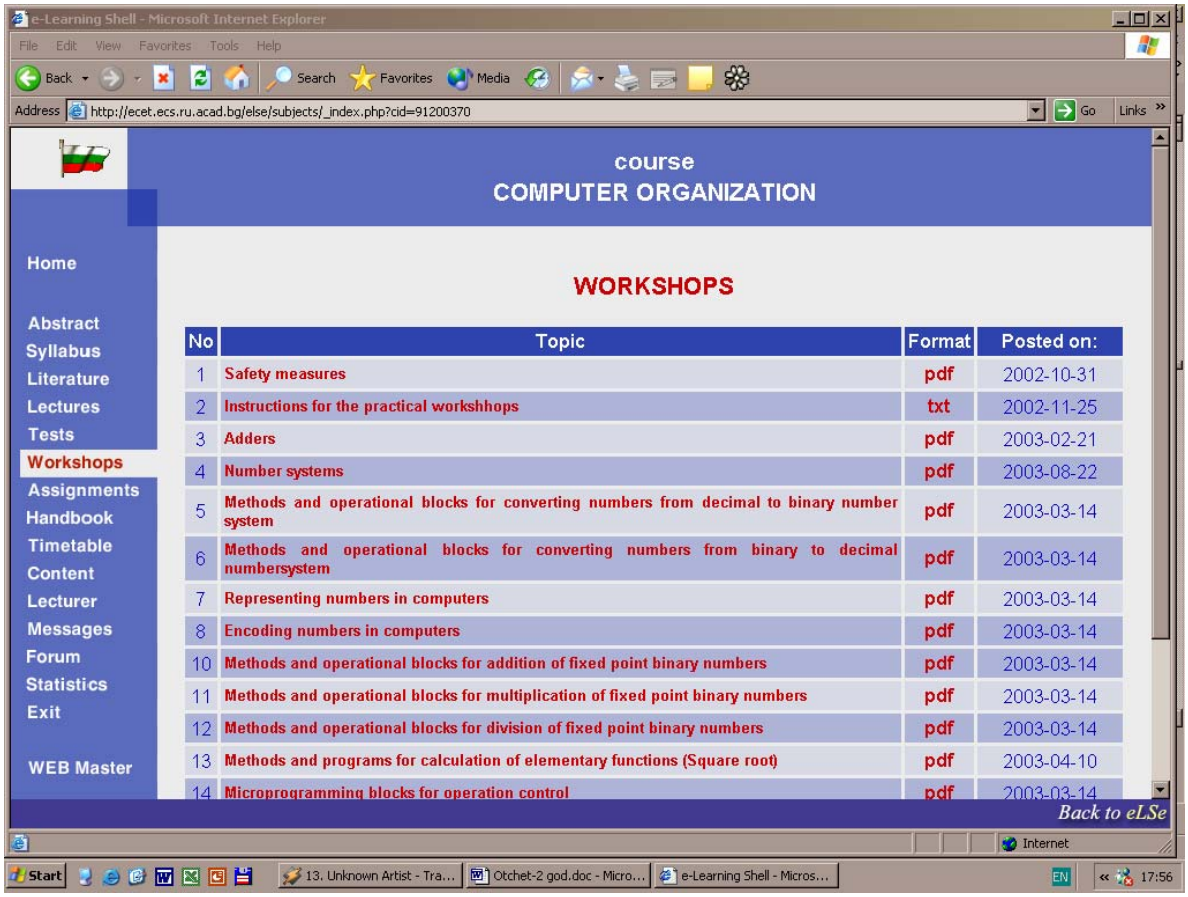

e-Learning Shell - Microsoft Internet Explorer
http://ecet.ecs.ru.acad.bg/else/index.php?active=3
e-Learning Shell®
Български
Home
Help
Logout
Courses
Requests
WEB Master
FACULTIES
Please, select a faculty!
1 Faculty of Agricultural Mechanisation
2 Faculty of Mechanical and Manifacturing Engineering
3 Faculty of Electrical and Electronic Engineering and Automation
4 Faculty of Automotive and Transport Engineering
5 Faculty of Business and Management
6 Faculty of Pedagogy
7 Faculty of Law Studies
8 Silistra Branch
9 Technical College - Silistra
10 Technological College - Razgrad
11 Ph.D. Studies


e-Learning Shell - Microsoft Internet Explorer
http://ecet.ecs.ru.acad.bg/else/index.php?step=23300721&fid=904190300451
e-Learning Shell®
Български
Home
Help
Logout
Courses
Requests
WEB Master
DEGREE COURSES
Please, select a degree course!
1 Computer Systems and Technologies
2 Communications Technologies
3 Autonatics and Information and Control Systems
4 Electronics
5 Electrical Supply and Equipment
Back


e-Learning Shell - Microsoft Internet Explorer
http://ecet.ecs.ru.acad.bg/else/index.php?step=22110851&gid=90300460&fid=904190300451
e-Learning Shell®
Български
Home
Help
Logout
Courses
Requests
WEB Master
COURSES
Please, select a course!
1 COMPUTER ORGANIZATION
2 SINGLE-CHIP MICROCONTROLLERS
3 DIGITAL CIRQUITS
4 PRACTICE
5 DATABASES
6 ELECTRICAL MEASUREMENTS
7 COMPUTER NETWORKS
8 LOCAL AREA NETWORKS
9 COMPUTER PERIPHERALS
10 MACHINE SCIENCE
11 PROGRAMMING AND COMPUTER APPLICATIONS, PART I / PART II
12 SPECIALIZING PROJECT 1
13 OBJECT-ORIENTED PROGRAMMING


e-Learning Shell - Microsoft Internet Explorer
http://ecet.ecs.ru.acad.bg/else/subjects/_index.php?cid=91800310
course
COMPUTER ORGANIZATION
Home
Abstract
Syllabus
Literature
Lectures
Tests
Workshops
Assignments
Handbook
Timetable
Content
Lecturer
Messages
Forum
Statistics
Exit
WEB Master
Welcome to the site of the course in COMPUTER ORGANIZATION!
You are visitor No 7912.
Change your password
Change the course logo
Change the graphic design
Add Course To Existing Degree Course
Remove Course From Existing Degree Course
Back to eLSe


e-Learning Shell - Microsoft Internet Explorer
http://ecet.ecs.ru.acad.bg/else/subjects/_index.php?cid=91800310
course
COMPUTER ORGANIZATION
Home
Abstract
Syllabus
Literature
Lectures
Tests
Workshops
Assignments
Handbook
Timetable
Content
Lecturer
Messages
Forum
Statistics
Exit
WEB Master
BASIC LECTURES
No | Topic | Format | Presentation | Audio | Video | Posted on:
1 | Used abbreviations | pdf | 2003-10-10
2 | Module 1: Adders | 2003-03-12
3 | Definition, classification, basic features | pdf | 2003-11-05
4 | Single-bit adders | pdf | 2003-03-13
5 | Multi-bit adders | pdf | 2003-03-13
6 | Decimal adders. Subtractors. Controlable adders | pdf | 2003-03-13
7 | Module 2: Number Systems | 2003-03-12
8 | Definition and classification | pdf | 2003-11-17
9 | Binary number system and binary arithmetic | pdf | 2003-08-22
10 | Module 3: Converting numbers from one number system to another | 2003-08-23
11 | General method for conversion between positional number systems | pdf | 2003-08-23
12 | Module 4: Methods and operational blocks for converting numbers from decimal to binary | 2003-08-23
Back to eLSe


e-Learning Shell - Microsoft Internet Explorer
http://ecet.ecs.ru.acad.bg/else/subjects/_index.php?cid=91200370
course
COMPUTER ORGANIZATION
Home
Abstract
Syllabus
Literature
Lectures
Tests
Workshops
Assignments
Handbook
Timetable
Content
Lecturer
Messages
Forum
Statistics
Exit
WEB Master
WORKSHOPS
No | Topic | Format | Posted on:
1 | Safety measures | pdf | 2002-10-31
2 | Instructions for the practical workshhops | txt | 2002-11-25
3 | Adders | pdf | 2003-02-21
4 | Number systems | pdf | 2003-08-22
5 | Methods and operational blocks for converting numbers from decimal to binary number system | pdf | 2003-03-14
6 | Methods and operational blocks for converting numbers from binary to decimal numbersystem | pdf | 2003-03-14
7 | Representing numbers in computers | pdf | 2003-03-14
8 | Encoding numbers in computers | pdf | 2003-03-14
10 | Methods and operational blocks for addition of fixed point binary numbers | pdf | 2003-03-14
11 | Methods and operational blocks for multiplication of fixed point binary numbers | pdf | 2003-03-14
12 | Methods and operational blocks for division of fixed point binary numbers | pdf | 2003-03-14
13 | Methods and programs for calculation of elementary functions (Square root) | pdf | 2003-04-10
14 | Microprogramming blocks for operation control | pdf | 2003-03-14
Back to eLSe

Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

Virtual Laboratory of Computer Organization

Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

Definition for the Virtual Laboratory

The Virtual Laboratory is a collection of WEB based interactive software models of real devices and systems, working with which the students raise the theoretical knowledge and practical skills.

Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

Requirements to the Virtual Laboratory

The virtual laboratory should:

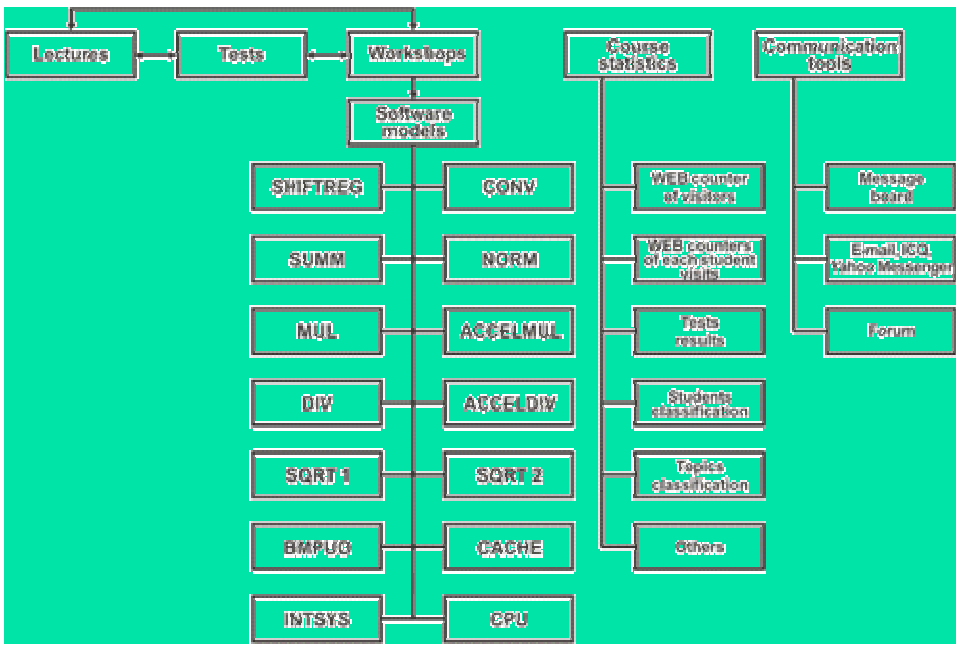
- **offer sufficient, in terms of content and quantity, theoretical material enabling the students to familiarize themselves in details with the phenomena, devices and systems, considered in the course;**
- **include tests for control of gained knowledge;**
- **include detailed directions for carrying 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.**

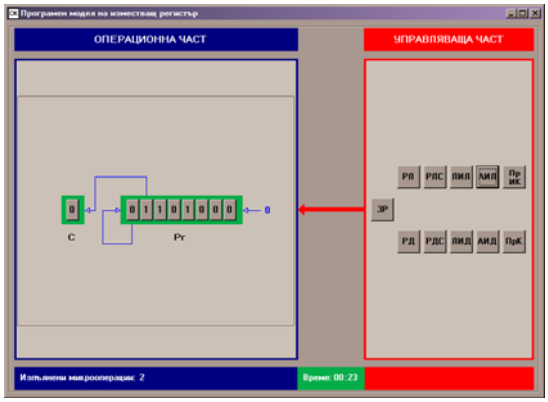
Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

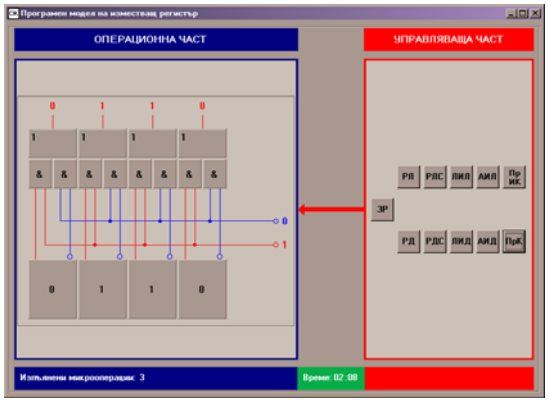
Structure of the Virtual Laboratory



Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

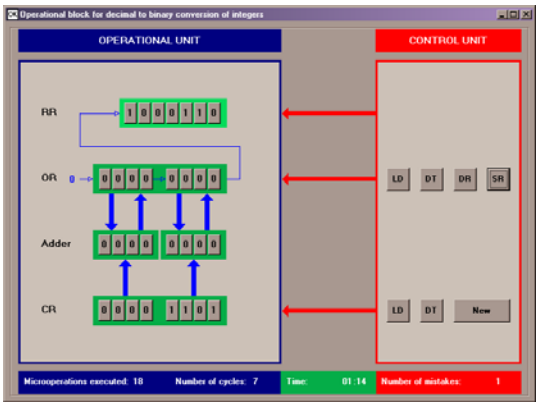
Models of Shift Registers

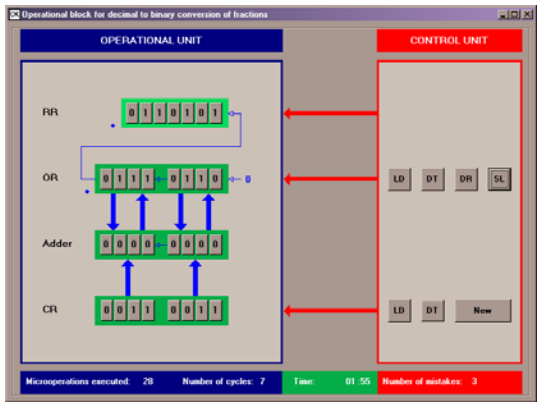




Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

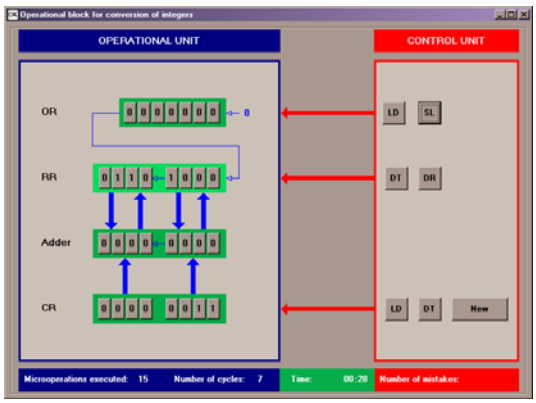
Models of Operational Blocks for Decimal to Binary Conversion

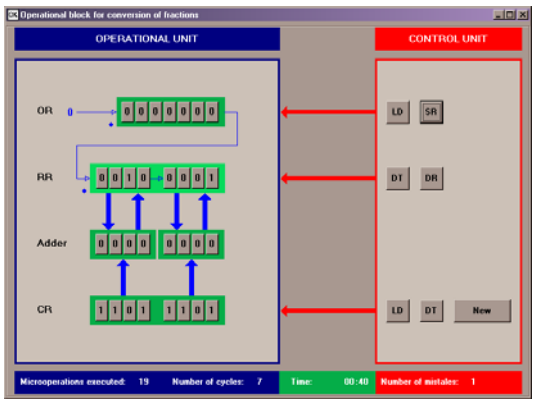




Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

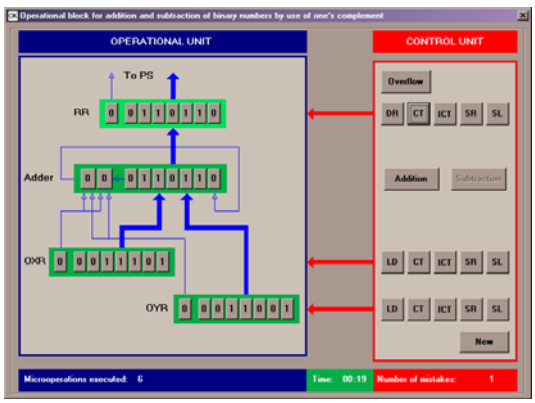
Models of Operational Blocks for Binary to Decimal Conversion

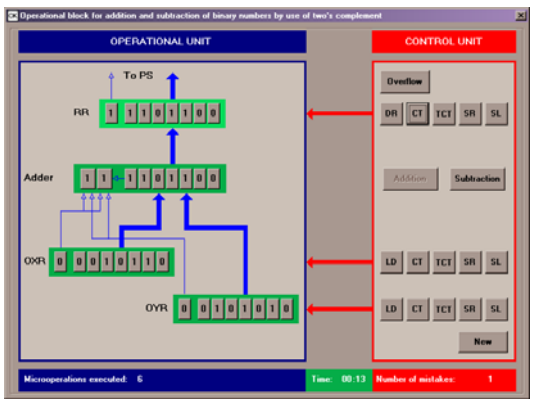




Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

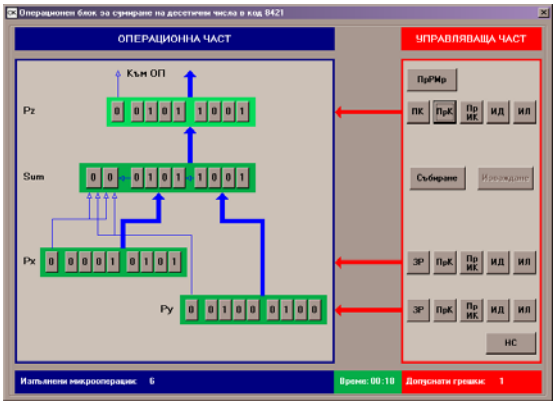
Models of Operational Blocks for Addition of Binary Numbers

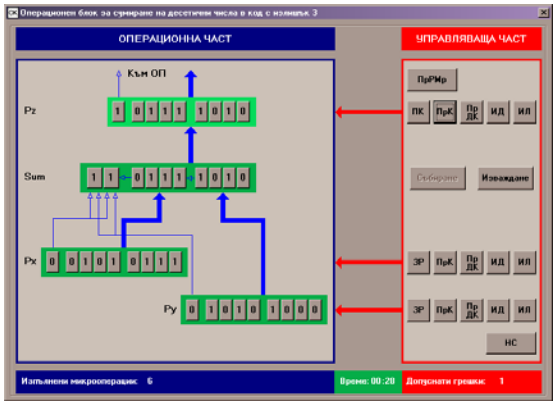




Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

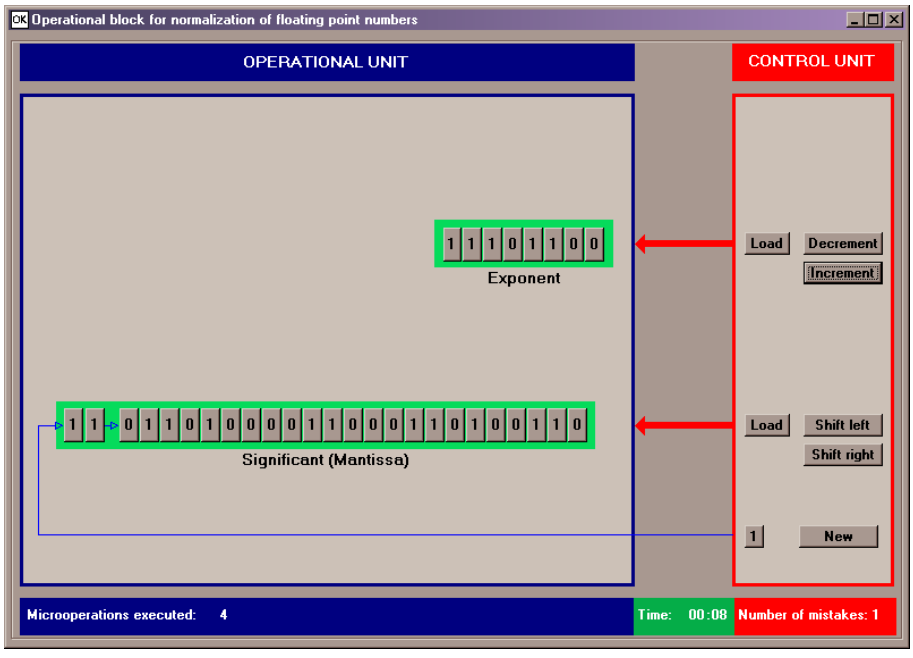
Models of Operational Blocks for Addition of Decimal Binary Encoded Numbers





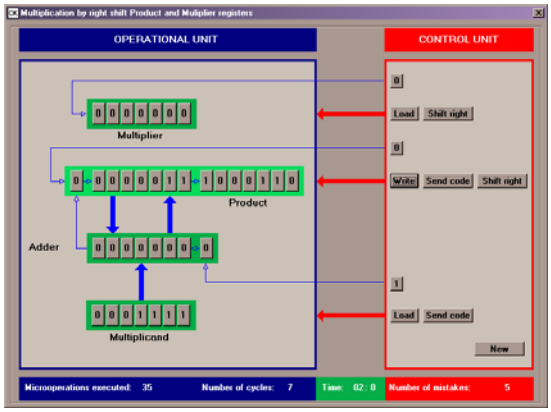
Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

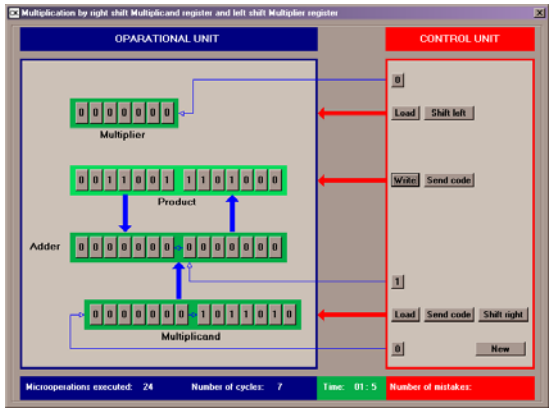
Model of Operational Block for Normalization



Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

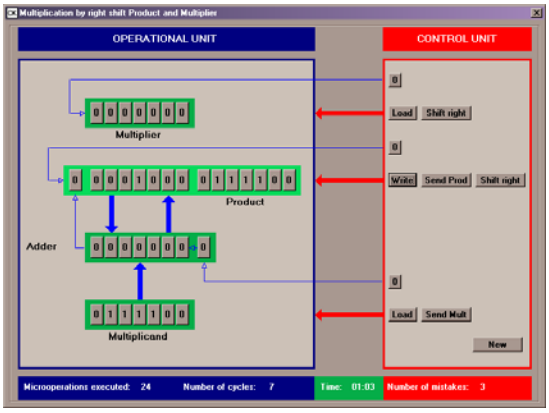
Models of Operational Blocks for Multiplication

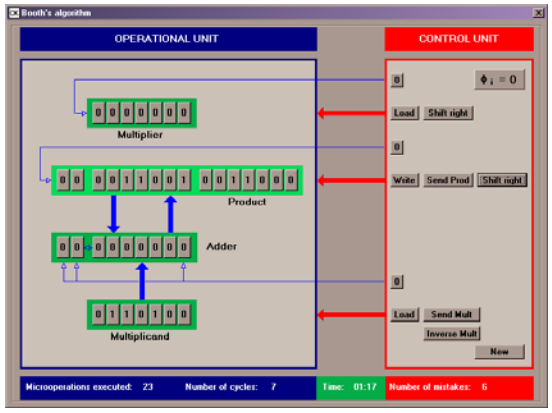




Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

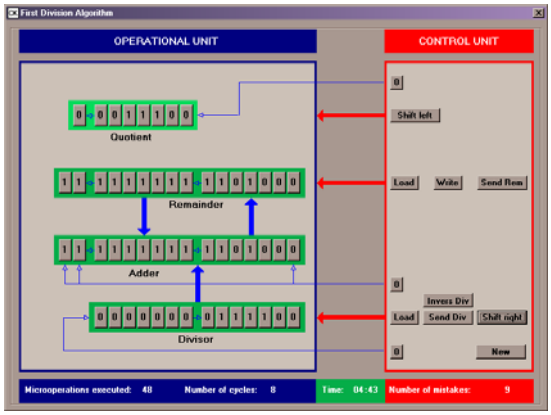
Models of Operational Blocks for Accelerated Multiplication

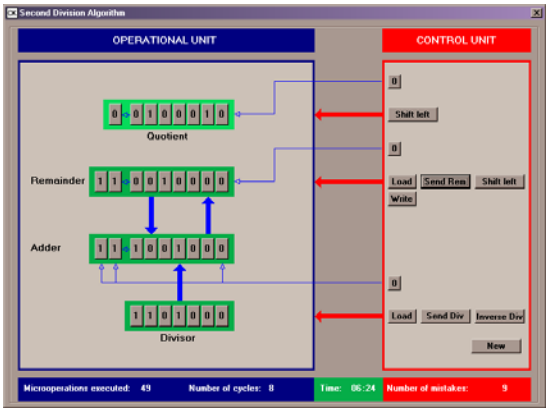




Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

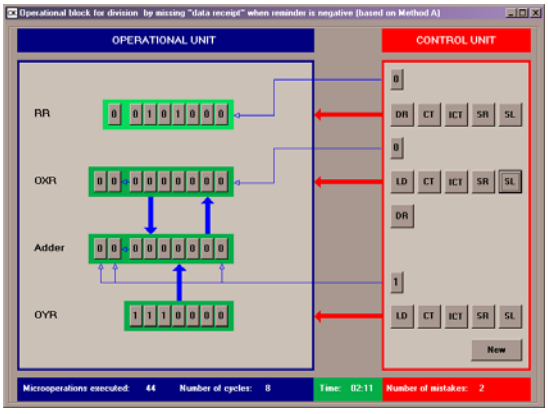
Models of Operational Blocks for Division

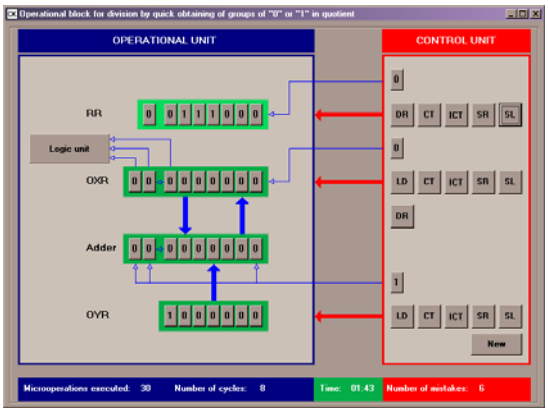




Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

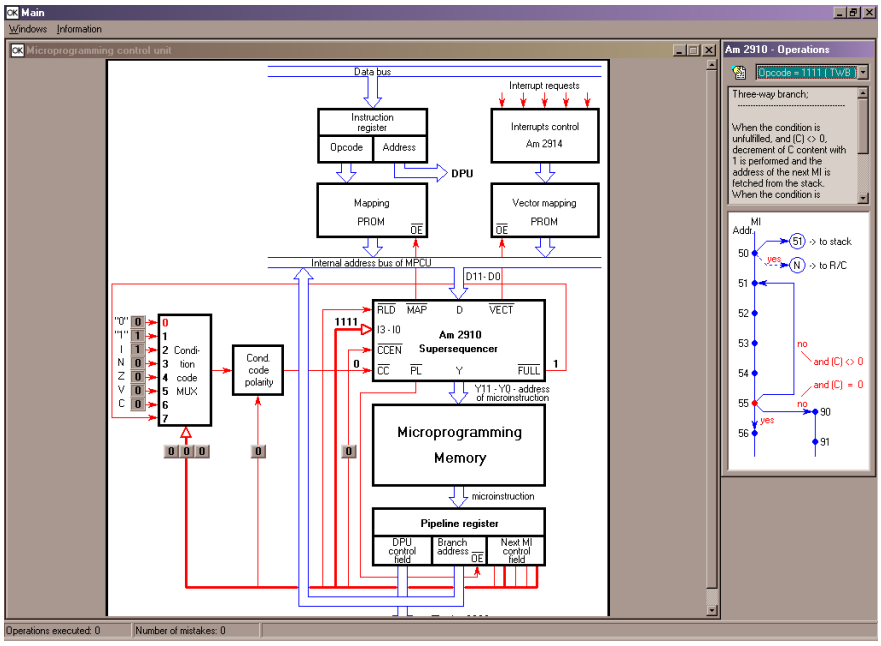
Models of Operational Blocks for Accelerated Division





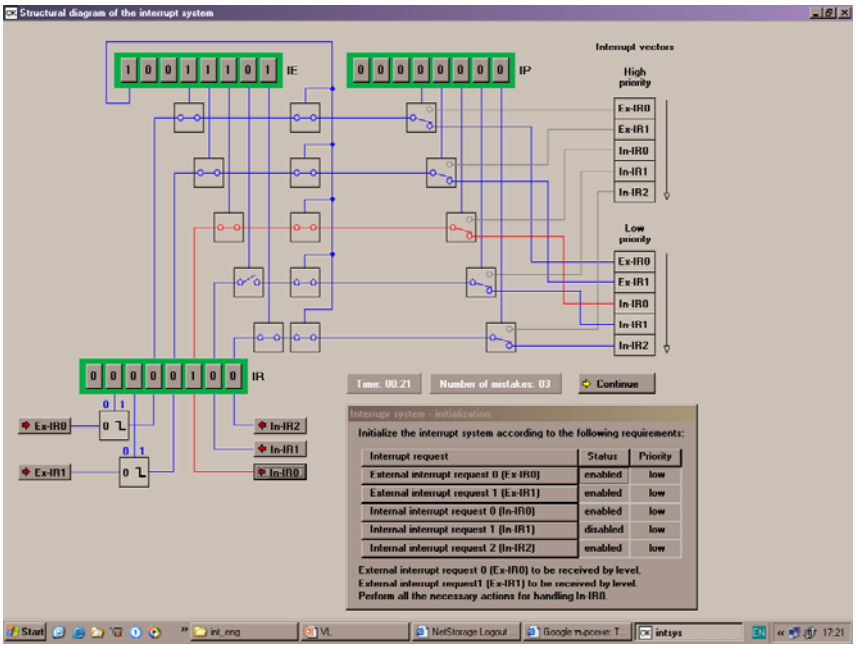
Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

Model of a Microprogramming Unit for Operation Control



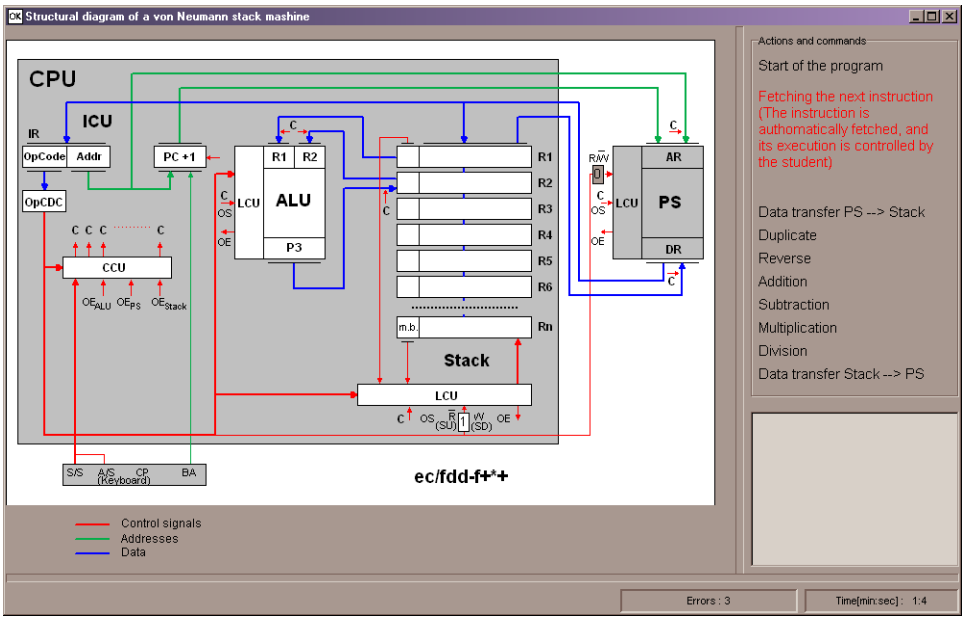
Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

Model of an Interrupt System



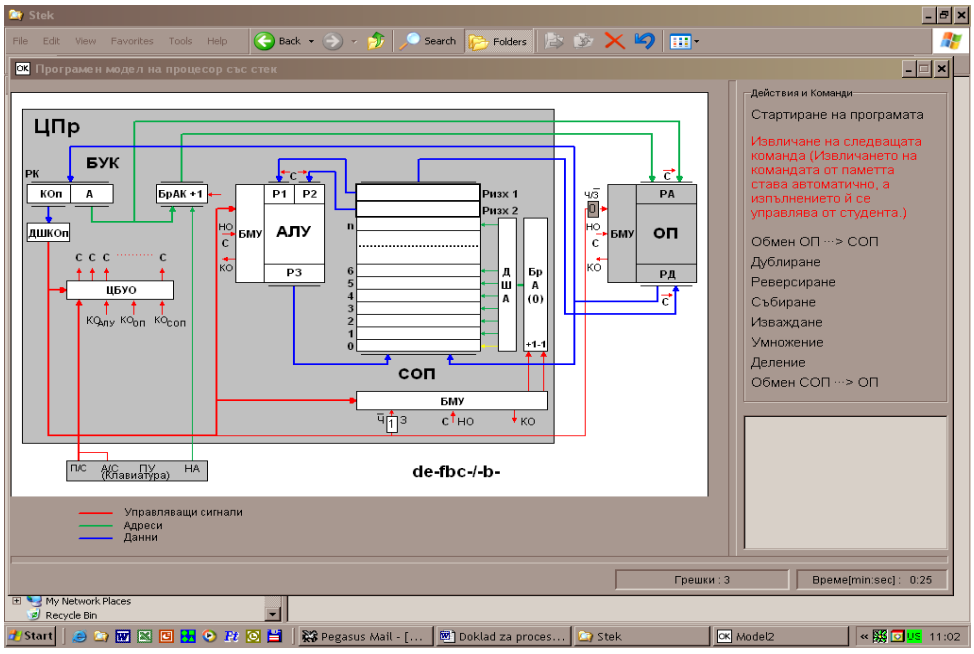
Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

Model of a Processor with Stack – version 1

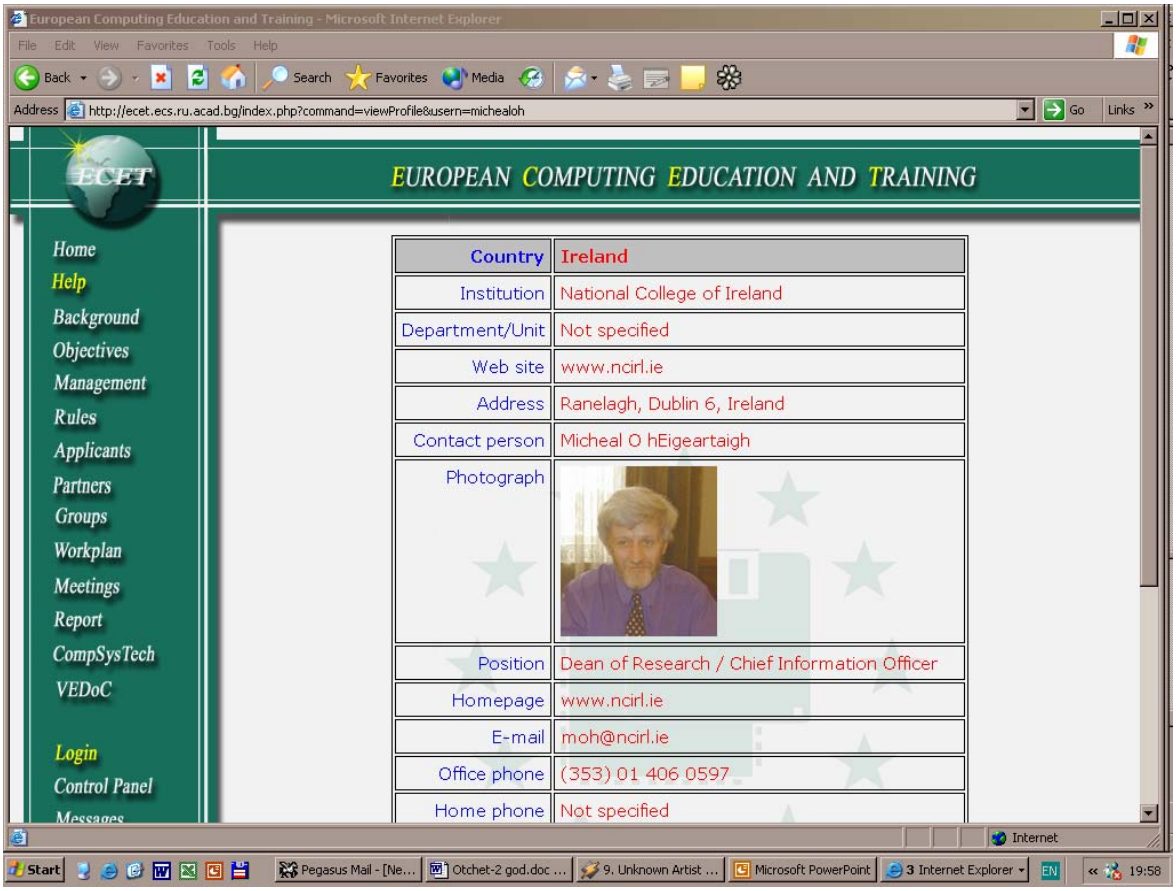


Thematic Network
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(ECET)

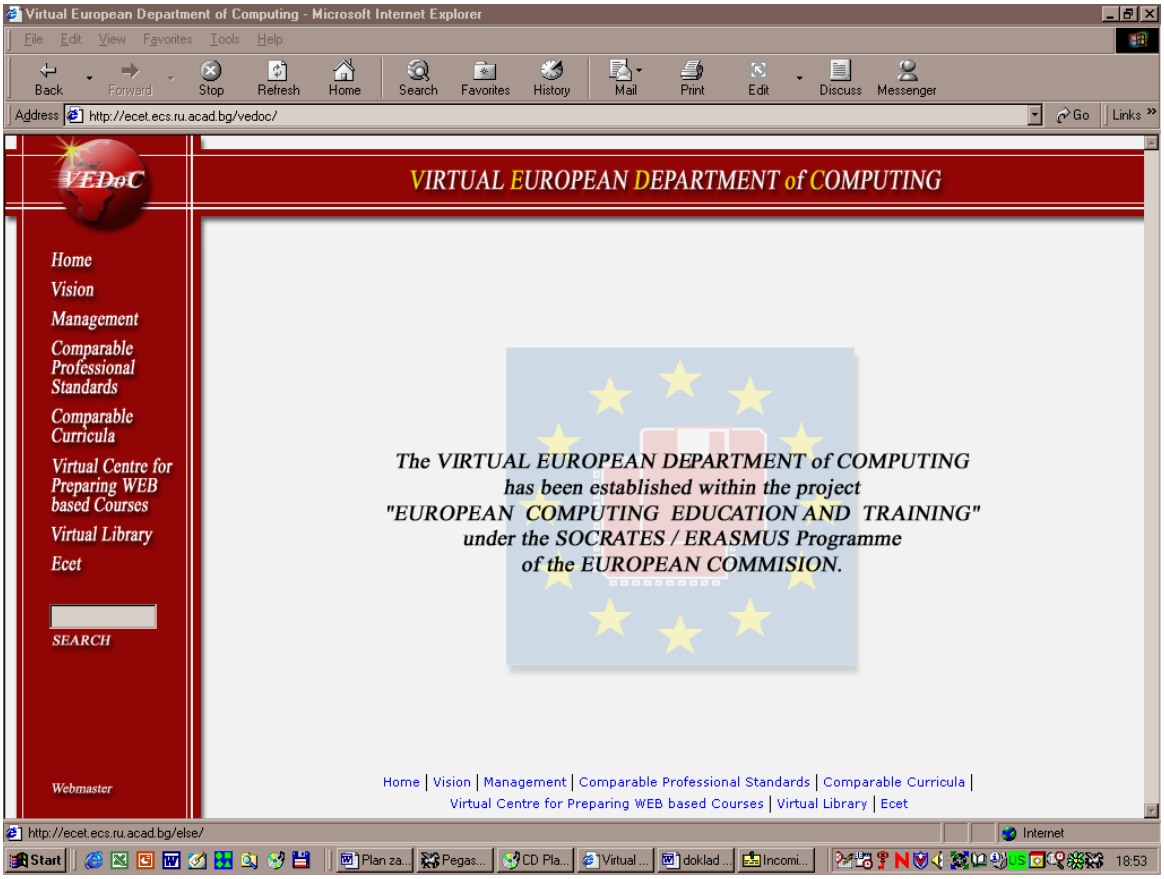
Model of a Processor with Stack – version 2

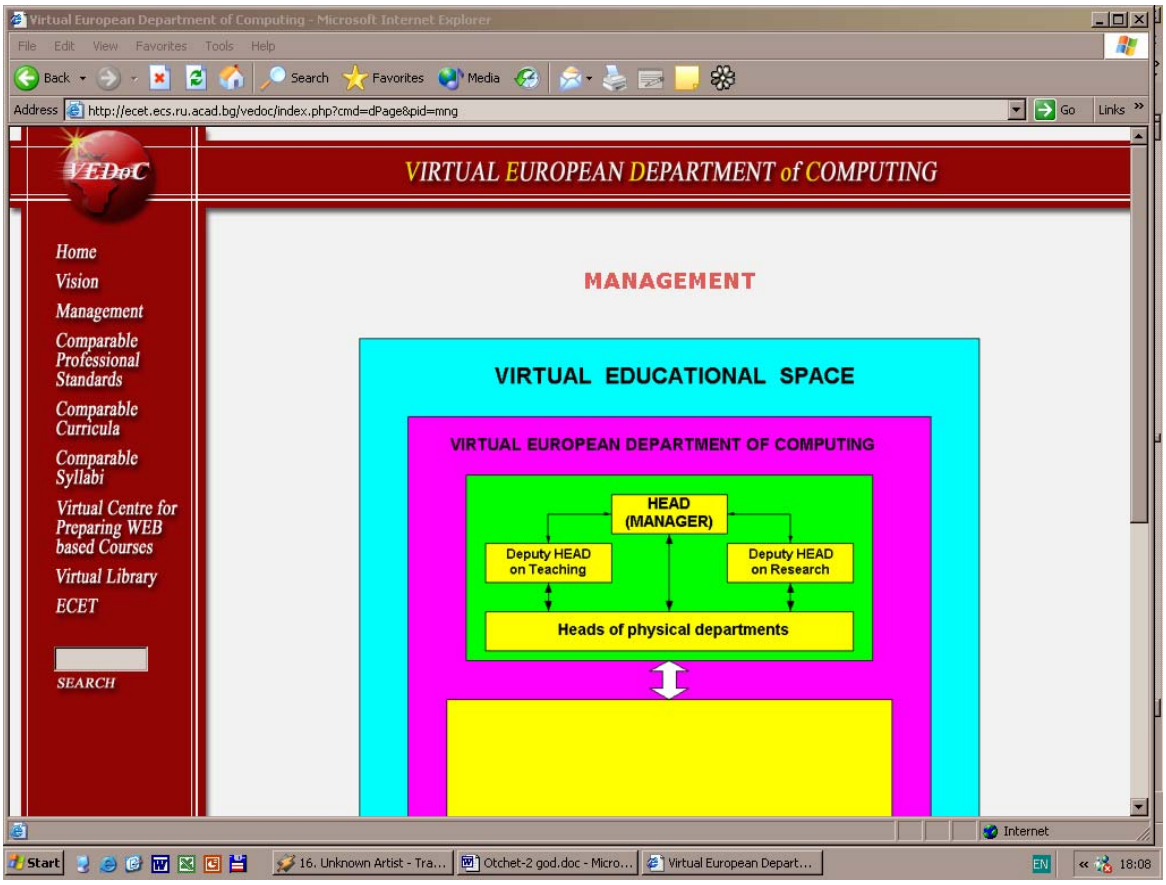


WEB site of the Thematic Network ECET
URL:http://ecet.ecs.ru.acad.bg/

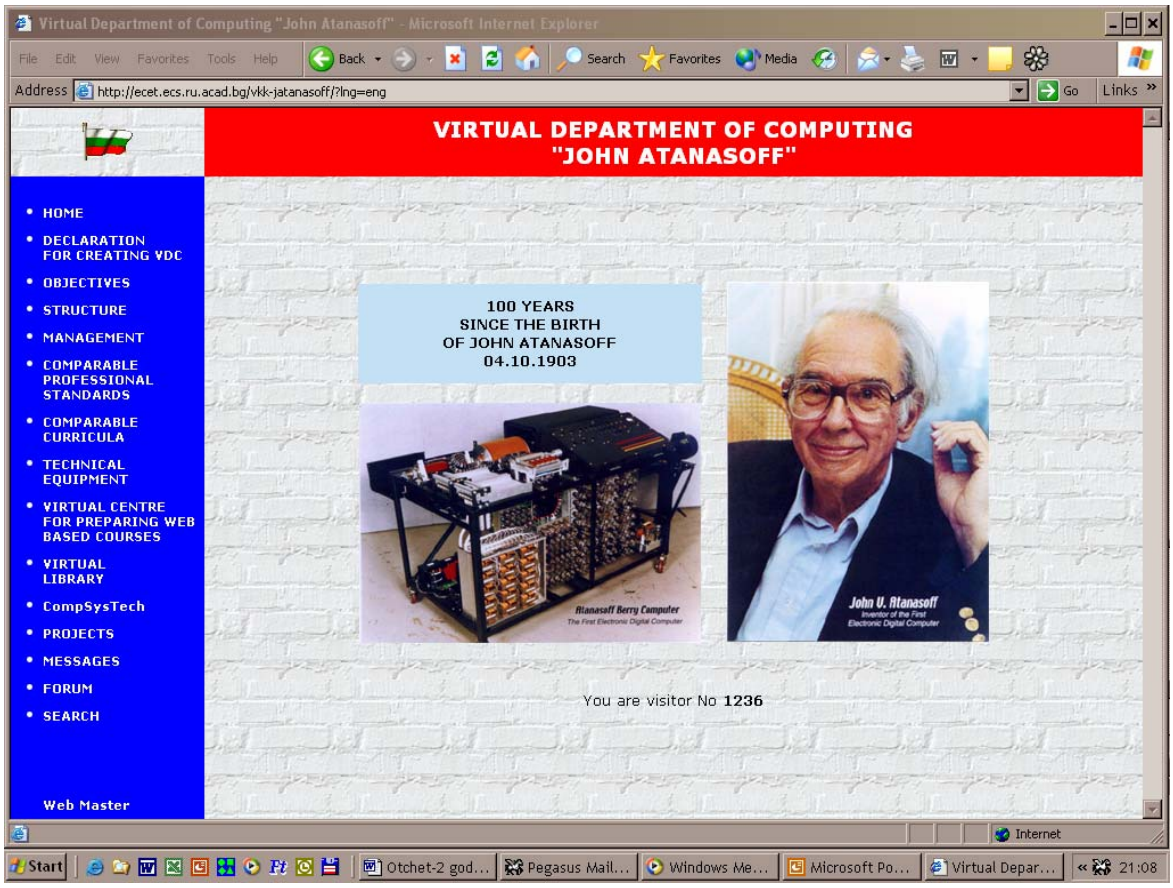


WEB site of the Virtual European Department of Computing
URL: http://ecet.ecs.ru.acad.bg/vedoc/

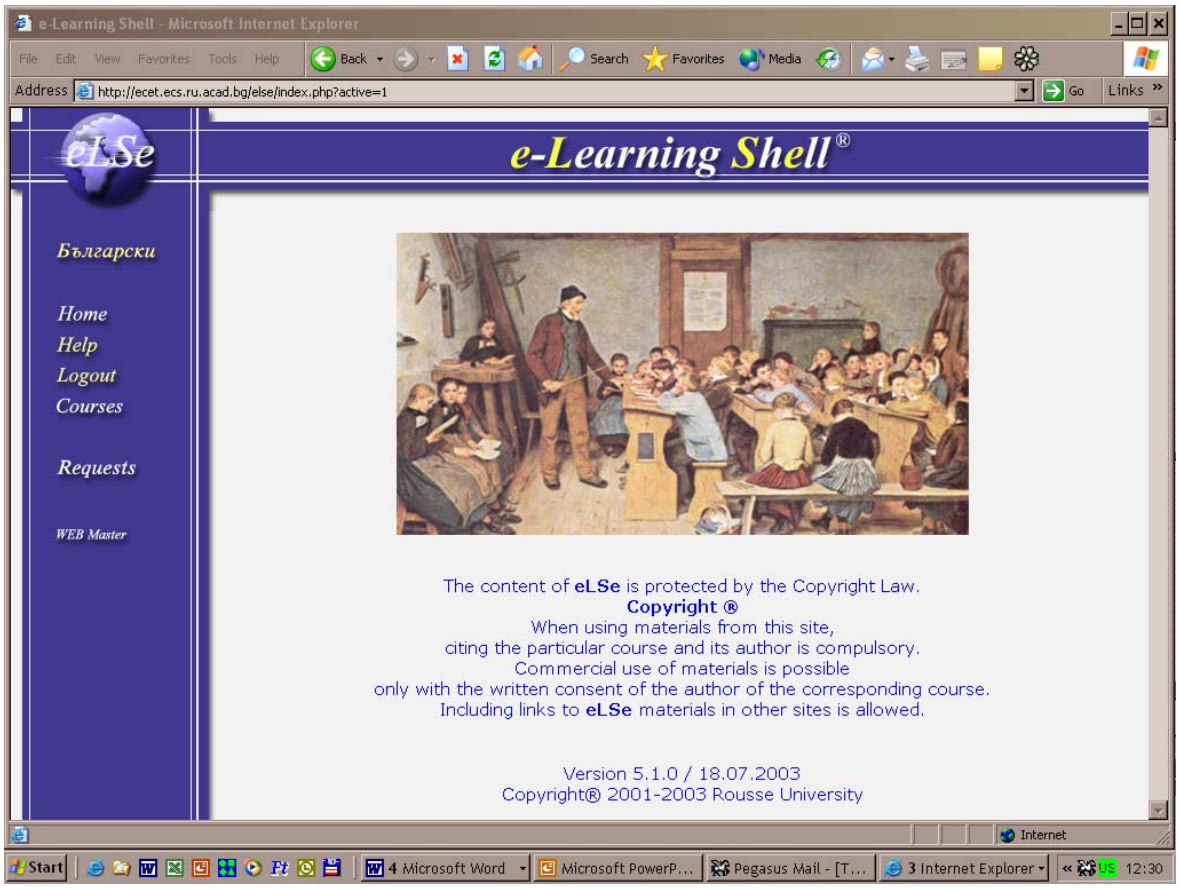


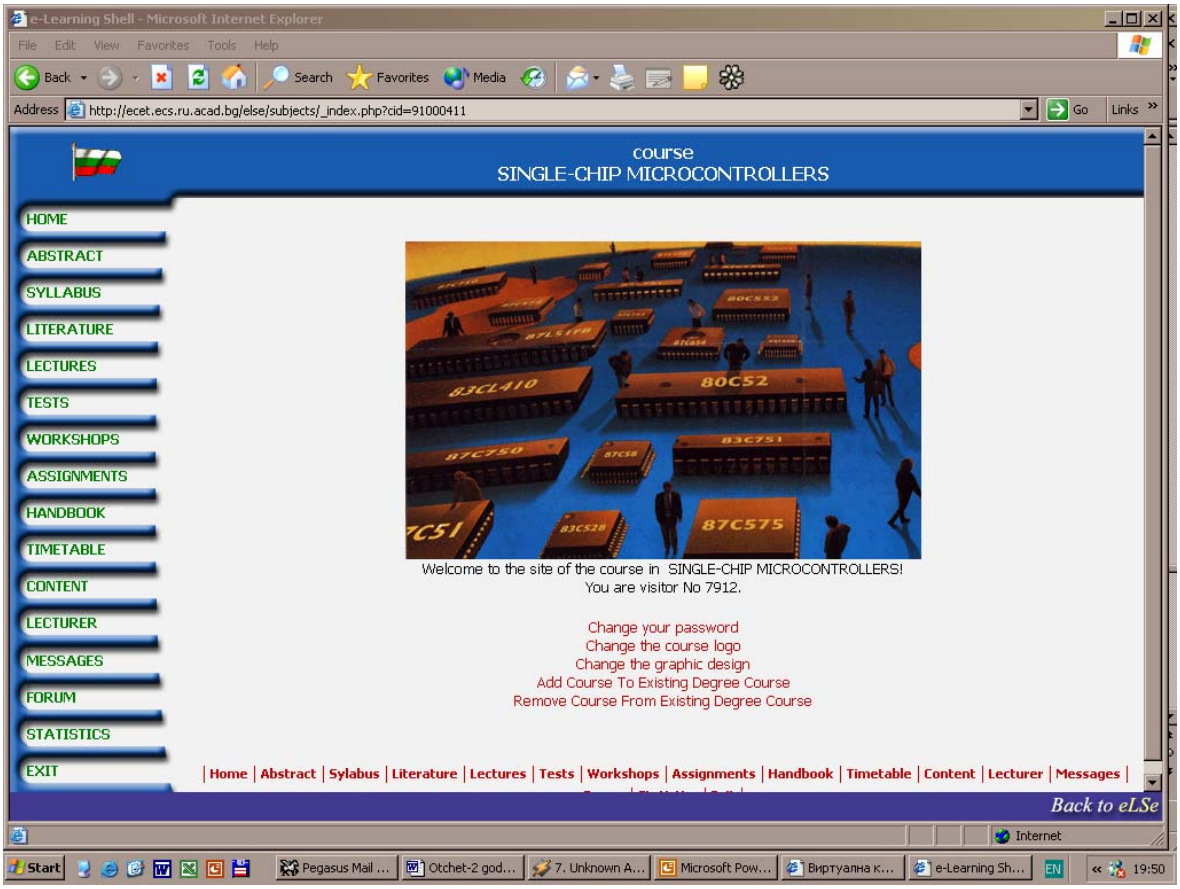


WEB site of the Virtual Department of Computing “John Atanasoff”
URL: http://ecet.ecs.ru.acad.bg/vkk-jatanasoff/

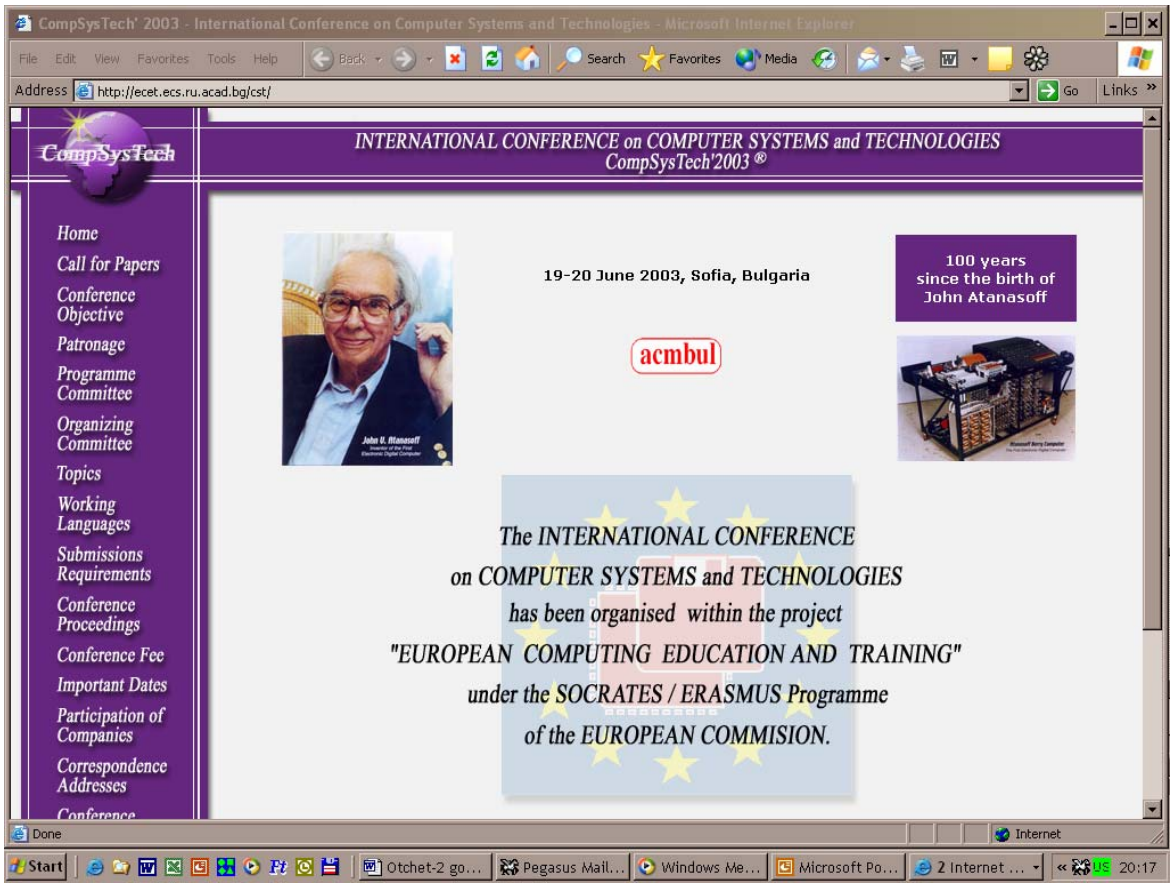


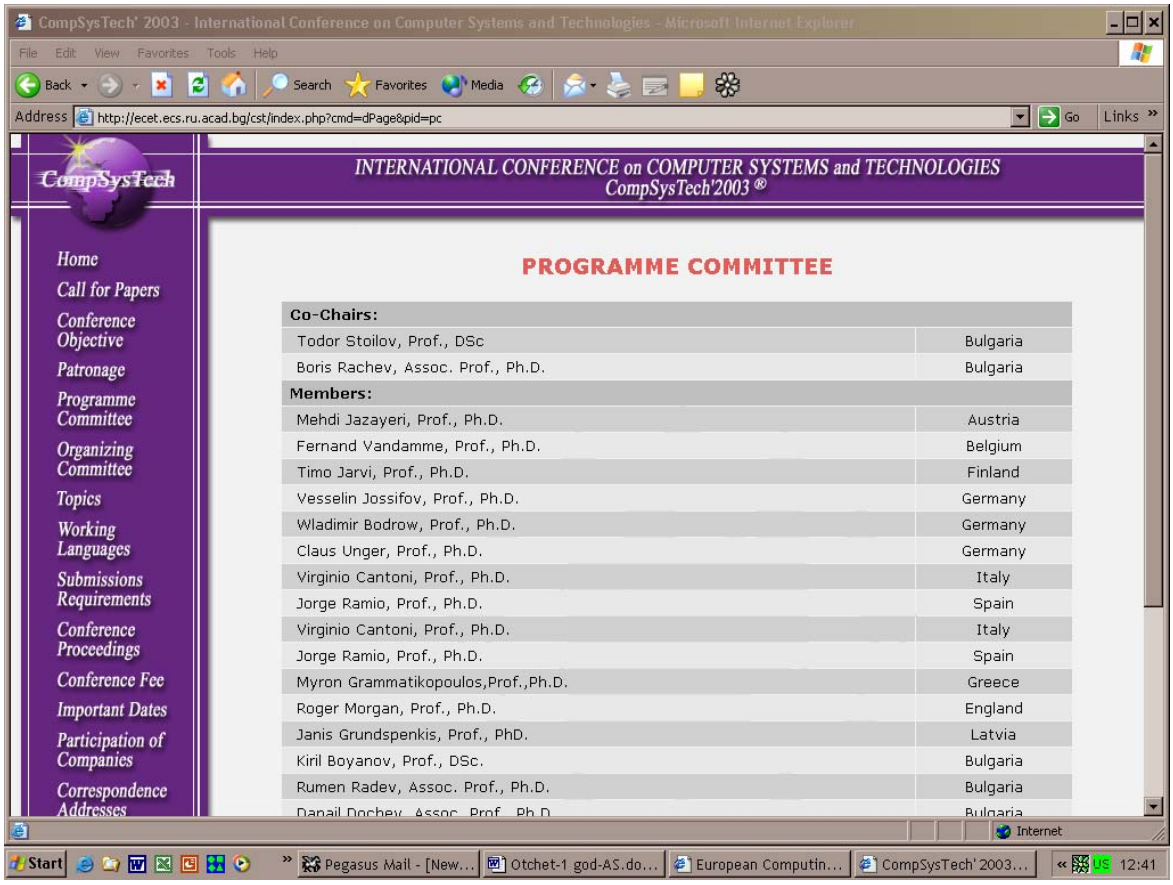
WEB site of the Virtual Centre for Preparing WEB based Courses
URL: http://ecet.ecs.ru.acad.bg/else/



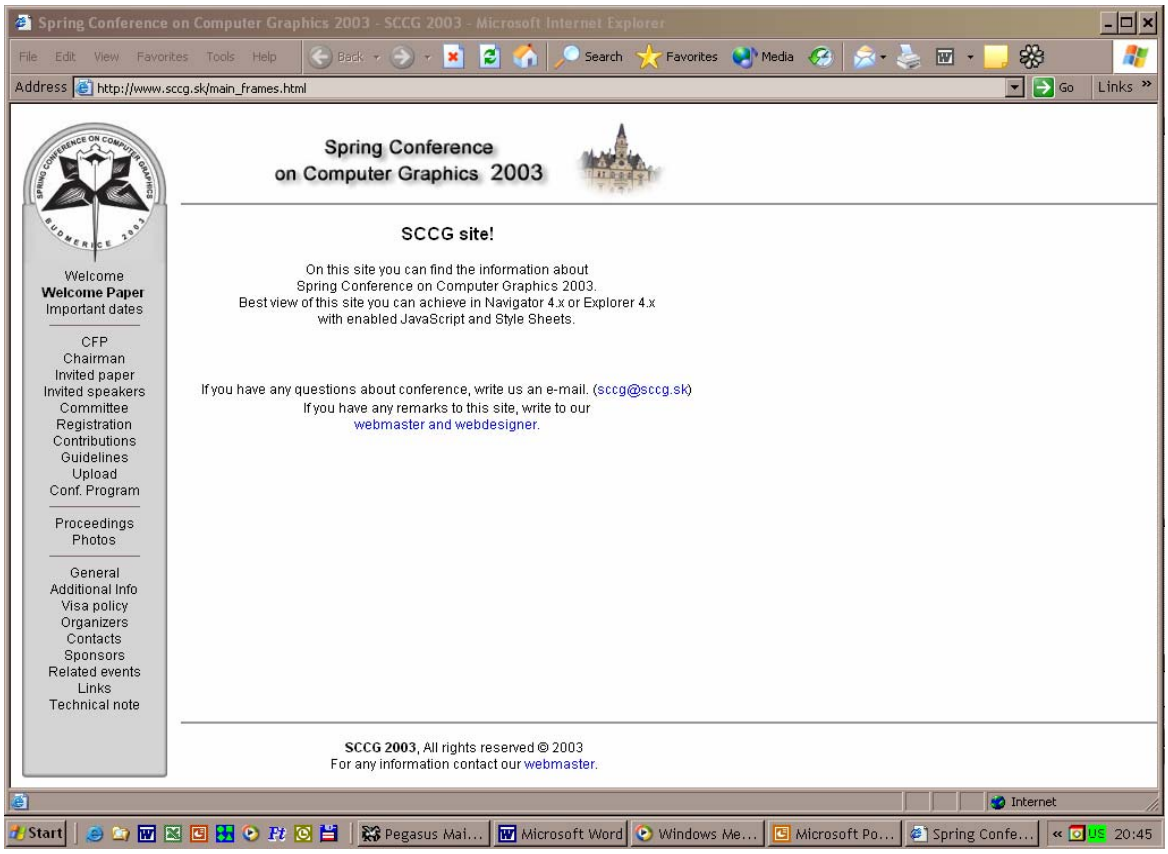


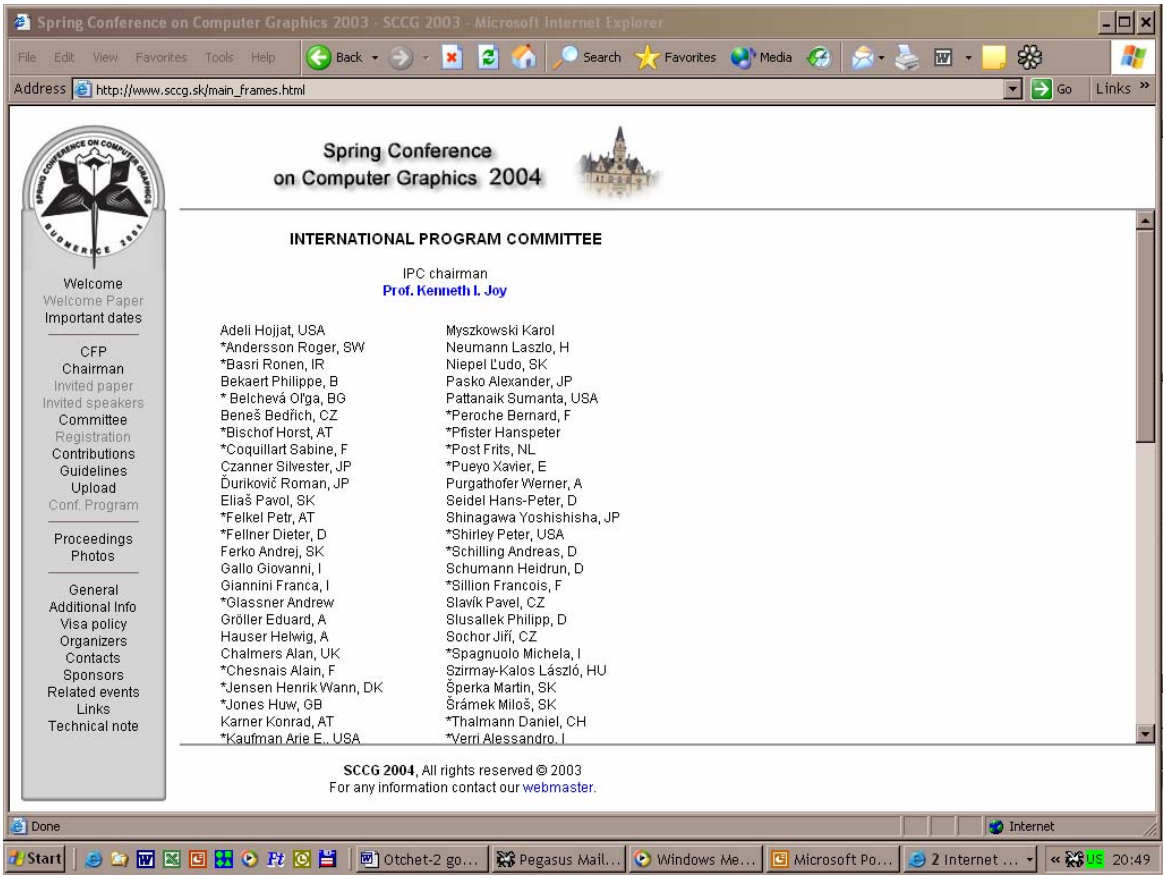
WEB site of the CompSysTech'2003
URL: http://ecet.ecs.ru.acad.bg/cst/



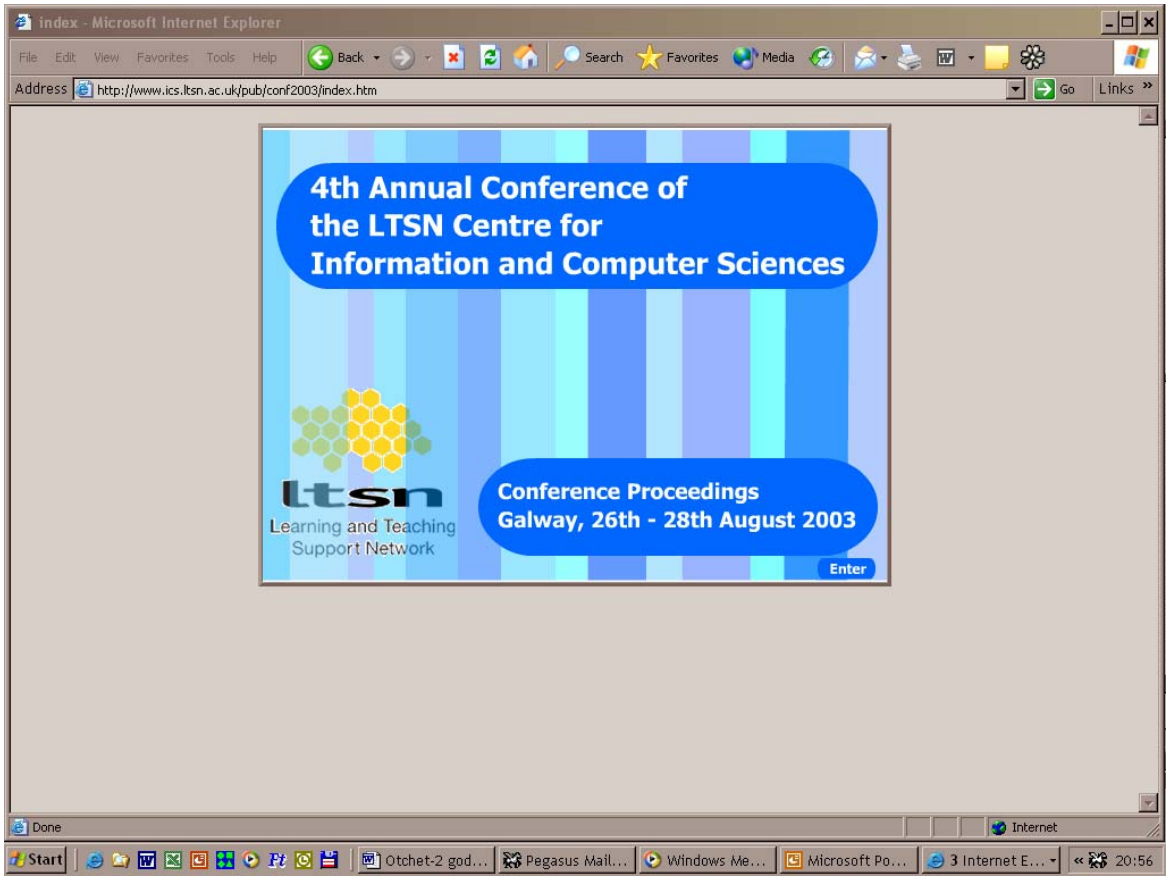


WEB site of the Spring Conference in Computer Graphics 2003
URL: http://www.sccg.sk/main_frames.html

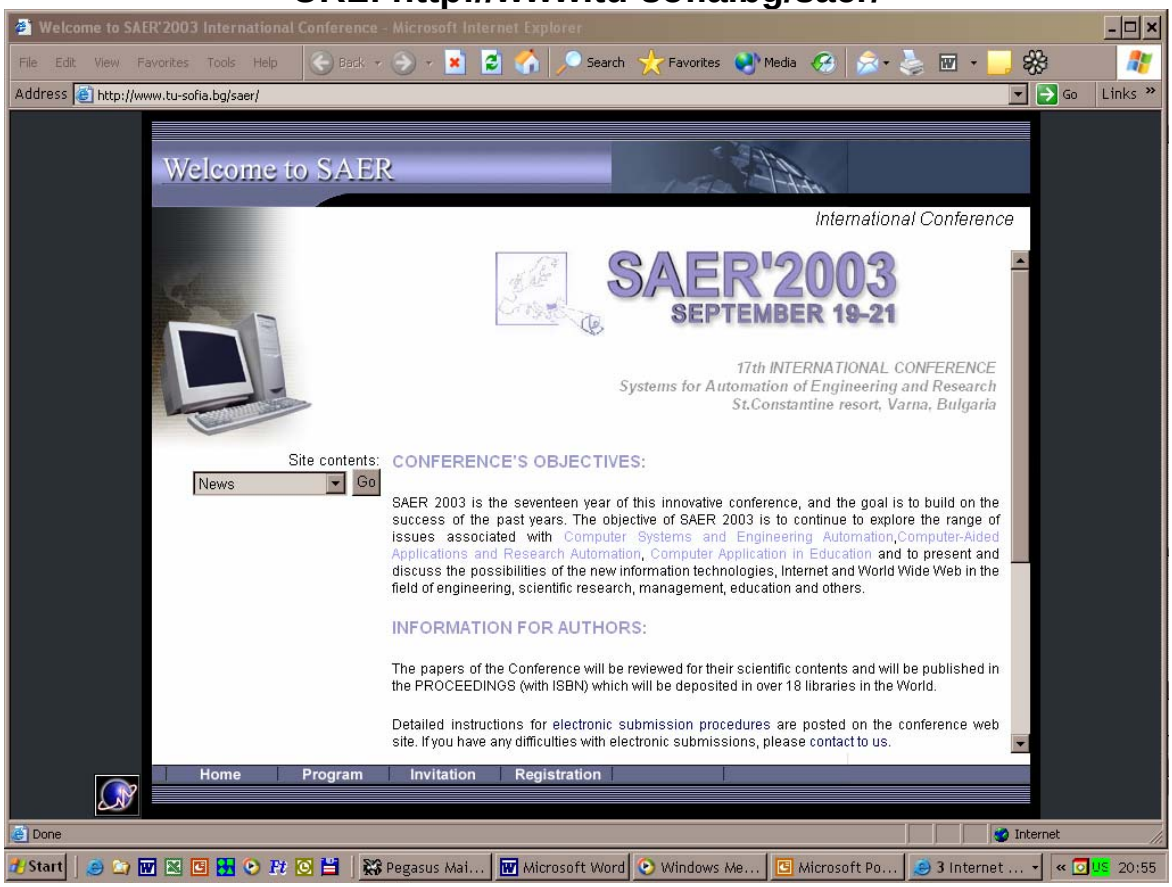


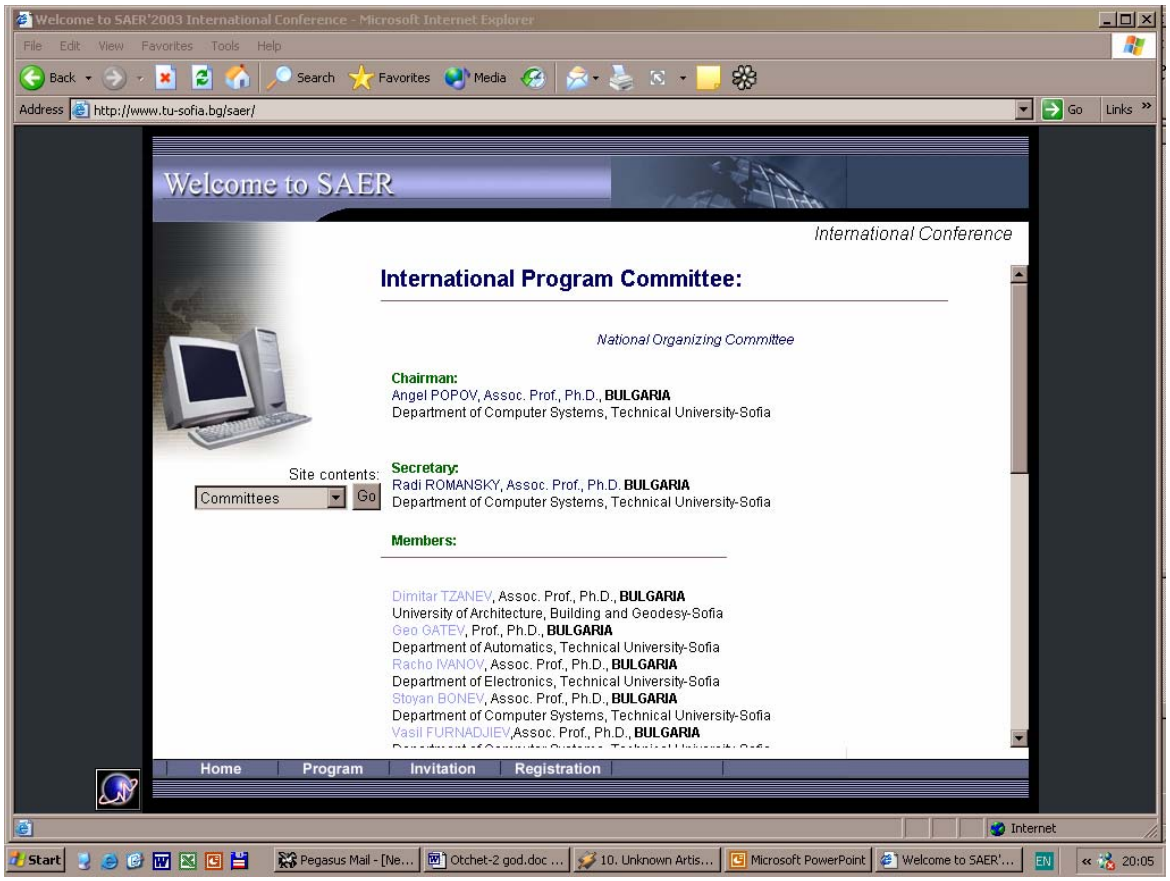


WEB site of the 4-th Annual Conference of the LTSN-ICS
URL: http://www.ics.ltsn.ac.uk/pub/conf2003/index.htm



WEB site of the 17th International Conference Systems for Automation of Engineering and Research URL: http://www.tu-sofia.bg/saer/





A N N E X 3

Partner Agreement

CONTRACT

European Computing Education and Training

213871-CP-2-2002-1-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-2-2002-1-BG-ERASMUS-TN** signed between ***Boris Tomov, Rector of the University of Rousse*** and the Commission on ***24.01.2003.*** 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 ***1/10/2002***. This Contract will cover the period up ***1/10/2002*** to ***30/09/2003.***

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 ***10/08/2003*** firstly, interim declaration of the real and total expenditures of the work undertaken during the periods ***01/10/2002*** to ***31/07/2003***, 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. **10/10/2003**.

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 31/07/2003).

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 (20%), 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-2-2002-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2002 - 30.09.2003

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-2-2002-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2002 - 30.09.2003

Personnel involved in the project:

Name:

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-2-2002-1-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-2-2002-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2002 - 30.09.2003

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-2-2002-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2002 - 30.09.2003

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-2-2002-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2002 - 30.09.2003

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-2-2002-1-BG-ERASMUS-TN

Institution:

Period: 01.10.2002 - 30.09.2003

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

by Stanley Oldfield
Member of the Evaluation Board

Introduction

This report provides an internal evaluation of the work undertaken on the project during its second year of operation. It covers the period from October 2002 to September 2003. It considers the plan of activities for that period as agreed at the end of the first year of the project and assesses the activities undertaken and the outputs delivered during the year in relation to that plan.

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 main agreed objectives for the second year were:

1. Develop comparable curricula for the Master of Computing degree
2. Develop comparable syllabi for the Bachelor and Master of Computing degrees
3. Strengthen and develop the VEDoC
4. Create the Virtual Centre for preparing Web based courses
5. Populate the Virtual Library with Web based courses
6. Organise an international conference on Computing
7. Consider the implications of introducing ECTS and SQC frameworks
8. Consider the mechanism for creating an ECEA
9. Establish means to expand the Thematic Network
10. Prepare continuation bid, reports and work plans for subsequent project stages

These objectives were outlined and discussed at the final meeting for the first year of the project, held in Vienna in September 2002.

The next sections of this report will outline more specific comments on objectives, processes and outcomes.

Project Management

Project management was well-established during the first year, and has continued to operate effectively throughout the second year. Plans for the scheduling of activities and responsibilities for carrying out the various tasks during the year were made available to all project partners in a timely manner, allowing opportunity for discussion.

The second year objectives have broadly been met and in this respect the project is on target. Two main project meetings have been held, in Sofia, Bulgaria and in Berlin, Germany and in addition the project has been officially represented in conference meetings in Bratislava, Czech Republic; Sofia, Bulgaria; Galway, Ireland and Varna, Bulgaria. These meetings have ensured that the process of familiarisation by partner members with the backgrounds and approaches which characterise each member country's educational practices in Computing has continued, and shared understanding of the similarities and differences in member's practices, opportunities and constraints has been further developed.

These meetings, in particular organisation of the Educational Aspects of Computer Systems and Technology thread of the CompSysTech conference in Sofia in June 2003, have enabled a significant number of project members to present papers on, and to engage in discussions of, the pedagogical aspects of teaching Computing at degree level, which has been an effective method for members to share their experiences.

Unfortunately the intention of significantly increasing the number of project partners as the project progressed has been restricted by the overall funding available for the second year, although several new members have been recruited despite this constraint.

Project Infrastructure

Web-site

The project web-site has been developed to allow more discussion to take place between project members. A number of separate strands of discussion have been put in place to provide forums for the different Expert Groups, to consider the range of existing syllabuses currently used in different partner institutions and to develop a common structure for the comparable curricula and syllabuses.

It is necessary for further work to be done on providing tools to support a more structured and accessible management of contributions to discussions. The use of some form of proprietary environment for Computer Mediated Communication would be particularly welcomed by project members.

Virtual Library Structure

Further development of the Virtual Library framework has been undertaken and the results of this were successfully demonstrated to project members at the meeting in

Berlin. The principle of sharing of resources has been implemented across the Computing departments of 11 Bulgarian universities, with materials for 23 web based courses based on the comparable curricula for the Bachelors degree being available within the Library framework and actually used in the teaching of undergraduate Computing specialists. These materials were prepared within the framework of the Virtual Centre for preparing Web based courses. In association with the expansion of the Virtual Library, further work has been done on developing the Virtual Laboratory in order to allow students access to simulated experimental activity, and again work in this area by project partners was demonstrated at the meeting in Berlin.

Examples of web based courses from other project partners have been sought to further populate the Virtual Library and one partner in particular - the University of Palermo, Sicily - demonstrated how such activity is progressing.

Learning Materials development

A point made in the first year evaluation report is re-iterated here. The creation of a project-based environment for developing learning materials is a valuable facility. However, the existence of a wide range of alternative commercial and proprietary development environments means that course materials, both from project partners and from other institutions, will come in a variety of forms and formats. If the VEDoC is to have a successful long term future then it needs to ensure that the site supports full interoperability of materials from different sources, so that it can integrate learning materials from a wide range of providers.

Learning Materials use

There are a number of problems associated with this activity that have not yet been fully addressed within the project. They relate to the issue of how it is envisaged that the 'virtual' facilities will be used. For example, are they seen as an additional resource for existing teaching activity in existing institutions, or are they seen as a stand-alone vehicle by which the material could be delivered, possibly at a distance? If the latter, then how is access to be controlled and financed, how is student activity to be monitored, how are students experiencing difficulties to be supported tutorial, what facilities will be available to ensure that disabled students can use the materials, how is student achievement to be assessed, etc? It will be necessary for significant debate on such issues to take place in the final year of the project if the results of the project are to be successfully disseminated.

Work of subject groups, Work of subject areas

Subject groups were established in the first year of the project in order to more meaningfully discuss the content of the various curricula and associated syllabuses for the families of degree awards considered by the project. Membership of the subject groups is spread across the full range of countries and institutions represented by members of the project and this ensures that a considerable range of experience of teaching Computing at university level is brought to the discussions.

Comparable standards

The groups have extended the first year work of developing recommended comparable standards for Bachelor of Computing degrees to the consideration of equivalent standards for Master of Computing degrees. They have also worked on the more detailed areas of syllabuses for the courses in the degrees covered by these standards, and two collections of these curricula and syllabuses have been agreed and published as project deliverables during the current year. These volumes should provide a medium for enhancing dissemination of the work of the project and material for further discussion.

It was indicated in the evaluation report for the first year that considerable differences of emphasis exist in curricula across project members, in particular about the role of mathematics in the computing curriculum, the balance between theoretical knowledge and practical skills, and the need to incorporate material to further the professional, legal, ethical and social education of the IT practitioner.

These differences are, if anything, even more marked at the postgraduate level, and the proposals for the Masters Degree must be seen in this light. They can at best reflect a common core of activity and subject matter, and do not address issues such as the difference between generic and specialist Master's degrees, or taught versus research-oriented Master's degrees.

There is limited awareness of these differences on the part of many individuals involved in the teaching of what is nominally the same subject across the various countries represented on the project. Further detailed discussion and documentation of the existing differences of approach and emphasis would be useful, particularly if the work of the project is to assist institutions when they are considering the implications of the Bologna agreement.

ECTS and SQC issues

One of the stated objectives of the project is to further the understanding and use of the European Credit (Accumulation and) Transfer Scheme (ECTS) and, alongside this, an associated System for Quality Control (SQC). Without a mechanism for monitoring and maintaining comparability of standards of delivery and assessment of the materials involved in the recommended curricula and syllabuses across institutional, and more critically national, boundaries there is little hope of the ECTS being successful.

Once again discussions between project members have revealed enormous variations in the way that quality assurance activity related to the delivery and assessment of academic courses is understood and practised across Europe. While some preliminary work has been done on this topic during the second year of the project there is a need to extend awareness of what mechanisms are currently in use, and to report on the relative success of various national and institutional initiatives. It would be valuable for this to form part of the third year activity of the project.

ECEA

The formation of a European Computer Education Association (ECEA) has also been given as an objective for the project. This is a rather ambitious proposal, in that it cuts across the activities of a number of existing organisations at national and international level. However it does reflect the fact that most of these organisations focus more on research into, and development and application of, new technology than on the pedagogical issues of how to teach students about that technology and its implications. Any success in bringing together the concerns of and representing the interests of those individuals responsible for educating future generations of Computing specialists is to be encouraged, although to be effective this will have to be done in close cooperation with existing organisations.

Overview

Significant progress has been made during the current year, and this is evidenced by the range of activities undertaken and deliverables produced, as indicated in the various sections of this report. Further thought needs to be given during the third year of the project to the way in which the products and insights of this project can be usefully disseminated to a wider audience and incorporated into the practice of other institutions.

October 2003
UK

EVALUATION REPORT

by Prof. Dr. Rumen Pranchov
Director of Higher Education Directorate
Ministry of Education and Science, Bulgaria
about main results of the work
under the project

Thematic Networks
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING

As a Director of the Higher Education Directorate at the Ministry of Education and Science I have been following the work of this SOCRATES project since its very beginning in 2001. I keep personal contact with the Project management as well as with the Bulgarian SOCRATES office, and with the Directorate-General for Education and Culture at the EUROPEAN COMMISSION. Ongoing information about specific results of the project work I also get from the TN ECET web site, as well as from the sites linked to it: those of the Virtual European Department of Computing, CompSysTech and e-Learning Shell.

Currently 65 universities and companies from the ICT sector participate in the consortium working under the project. That is, in comparison to the first year the number of partners has increased with 10. The project is coordinated by the Department of Computer Systems and Technology at the University of Rousse, which has an experience of many years in the management of large national and international consortiums.

As more significant results of the work in the second project year the following can be indicated:

- Comparable curricula have been prepared for a Master in:
  - Computer Science;
  - Computer Engineering;
  - Software Engineering;
  - Information Systems.

These curricula have been discussed at a virtual round table, as well as at the Meeting of 19 and 20 June in Sofia.

- Comparable syllabi have been prepared for a Bachelor and Master in:
  - Computer Science;
  - Computer Engineering;
  - Software Engineering;
  - Information Systems.
- Two Collections with Professional Standards, Curricula and Syllabi have been published, for a Bachelor and Master accordingly.
- The Erasmus ECTS Information Package has been updated and re-published.

These Collections, as well as the Information Package impress both with their content and layout.

- The Bulgarian branch of the Virtual European Department of Computing has been established. On 17 December 2002 rectors of 11 universities and directors of 4 institutes of the Bulgarian Academy of Sciences put their signatures below the Declaration of establishment of the department. The state supported this academic initiative with about 600 thousand EURO, which were used to equip 36 computer laboratories for e-Learning all over the country. In this Virtual Department of Computing, the Ministry of Education and Science sees the kernel of a future Virtual University.
- The Virtual Centre for Preparing WEB based Courses – "e-Learning Shell" has been completed. It was tested by our Ministry and was recommended to be used in the universities for the purposes of e-Learning. All universities members of the Bulgarian Virtual Department of Computing are already working with it. The developed WEB-based courses are being included in the Virtual Library.
- The work on the development of the first Virtual Laboratory of Computer Organization successfully goes on.
- The International conference on Computing-CompSysTech, with an emphasis on e-Learning has been organized and conducted.
- Members of TN ECET participated in organising and conducting a Spring Conference in Computer Graphics.
- Participation in organising and conducting the 4-th Annual Conference of the LTSN-ICS.

With the organisation of these three conferences one of the new requirements of the EUROPEAN COMMISSION to the Thematic Networks – to carry out not only teaching, but also research activities, has been accomplished.

- Conducting a Round table on computing education will take place.

In conclusion we can say that the Workplan for 2002 / 2003 of TN ECET is being completed successfully. The preconditions for Establishing of EUROPEAN COMPUTER EDUCATION ASSOCIATION, which is one of the most important tasks of the second and the third years, are already present.

I am glad that my opinion also coincides with the one of Mr. David Coyne, Director for Education in Directorate General for Education and Culture at the European Commission.

I wish everyone a successful work and a pleasant stay in Berlin!

28.10.03.
Sofia, Bulgaria

A N N E X 5

Workplan
for 2003 / 2004

No	Activity	Responsible	Date
1.	Elaborating the TN Workplan for 2003 / 2004.	Rousse University, MG	30.08.2003
2.	Submitting a proposal for continuing the TN ECET project in 2004 / 2005 for the purpose of disseminating the project results.	Rousse University, MG	28.02.2004
3.	Strengthening and developing further the Virtual European Department of Computing.	All Partners	Continuous
4.	Establishing a Virtual Library in Computing: • Creating a database of existing and newly developed on-line teaching aids in Computing. • Providing access to the database for all partners	Rousse University, all Partners	01.06.2004
5.	Opening a Virtual Center for preparing WEB based courses: • Developing the WEB based courses for the main courses of the comparable curricula; • Including the developed courses in the Virtual Library in Computing.	Rousse University, all Partners	01.06.2004
6.	Opening a Virtual Laboratories	Rousse University, University of Palermo, all Partners	01.06.2004
7.	Establishing and developing the open and distance education / training network.	EGs, WGs	01.05.2004
8.	Establishing a Site for virtual conference.	Rousse University	01.05.2004
9.	Organising and conducting an International conference on Computing	Rousse University, MG, EGs, WGs	17-18. 06.2004
10.	Participation in organising and conducting the International conference on Virtual Management and Open, Distant and Virtual Education	Gent University MG, EGs, WGs	05.09.2004
11.	Publishing Conference proceedings – both paper and electronic.	Coordinator	31.08.2004
12.	Attracting new members to the TN.	All Partners	30.01.2004
13.	Strengthening and developing further the EUROPEAN COMPUTER EDUCATION ASSOCIATION (ECEA):	MG, Society and Associations	15.06.2004
14.	Organising and conducting an international seminar for the purpose of disseminating ECET project work results.	TU-Sofia, Contact persons	20.09.2004
15.	Informing the public about the project work results by means of regional and national mass media.	All Partners	Continuous
16.	Preparing a report about project work results in the third year.	Rousse University, MG	30.10.2004

17.	Convening a MG Meeting for the purpose of: • Discussing and adopting the report; • Evaluating the ECET project results; • Planning the future activities of ECET. Discussing and adopting the Workplan for 2004 / 2005.	Rousse University, Contact Persons, EB	30.09.2004

Thematic Networks
213871-CP-2-2002-1-BG-ERASMUS-TN
EUROPEAN COMPUTING EDUCATION AND TRAINING
(TN ECET)

F I N A L R E P O R T
FOR THE SECOND YEAR
2002 / 2003

ISBN-954-712-214-2

Printed by Avangard Print Ltd.