**EUROPEAN COMMISSION**
**Directorate-General for Education and Culture**

# ANNEX III

# Report on the action's implementation and Summary report for publication (IR2)

# T E M P U S
# Joint European Project

## CD_JEP-41107-2006
(Agreement n°)

|  |  | **DEADLINE** |
|---|---|---|
| **2-year JEP** | All projects except those involving Russian Federation and Turkmenistan | 30/09/2008 |
|  | Projects involving Russian Federation and Turkmenistan | 31/03/2009 |

**Structure of the Report**

Annex III/2:          Declaration
Annex III/3-5:       Report on the action's implementation
Annex III/6-9        Statistics and indicators
Annex III/10:        Example on how to fill in the outcome tables
Annex III/11         Table of achieved/planned outcomes
Annex III/12-13:    Summary Report for publication
Annex III/14:        Acknowledgement of receipt

One original (with original signatures) and three copies are to be sent by the deadline with registered mail (date as per postmark) to:

Klaus Haupt
Deputy Head of Unit
Cooperation and International programmes
MADO – 08/90
Directorate-General Education and Culture
European Commission
B – 1049 Brussels

# DECLARATION

This declaration should be completed and signed by the following people:

1.      the <u>grantholder</u> of the Joint European Project;

2.      the person who is <u>legally authorised</u> to represent the <u>grantholder institution</u>.

*We, the undersigned, certify that we have submitted all the required documentation, including the documents listed in the checklist.*

*Furthermore, we certify that the information given in this <u>implementation report</u> is correct to the best of our knowledge and complies with the requirements of the provisions of Articles 1.6 and II.15 of the grant agreement.*

*We are aware that amendments to these documents will not be accepted after the date of submission.*

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Name of the <u>grantholder institution</u>: Universidad Politécnica de Madrid..................................................................

Name of the <u>grantholder</u>: Octavio Nieto-Taladriz .........      Name of the <u>legal representative</u>: José Manuel Páez Borrallo

Function: Head of Department ......................................      Function: Vice-Rector for International Relations........

Done at: Madrid...........................................................      Done at: Madrid ..............................................................

Date: December 4<sup>th</sup>, 2008 .............................................      Date: December 4<sup>th</sup>, 2008 .............................................

Signature: ..................................................................      Signature: ...................................................................

Seal of the <u>grantholder institution</u>:

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# LEVEL OF EXPENDITURE

Please, tick the appropriate box below.

☐      YES, we have spent **70 % of the first instalment** and the 'Payment Request' form has or will be sent (see Tempus website under Selection 2006 contractual documents).

X      NO, we have not yet spent **70 % of the first instalment**.
        Approximately …25…… % of first instalment has been spent until now.

# Report on the action's implementation

Please provide an overview on **the project's implementation**, by responding to the questions below:

## Overall achievement level

Please provide a description of activities carried out since the previous report. Please describe to what extent the obtained results since the beginning of the project are contributing to the project objectives.

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The activities may be summarized as follows:
  a.  Stabilized web sites at both PC universities with regular updates.
  b.  Stabilized services by the accounting departments at PC universities.
  c.  Successful communication with third parties from industry to discuss the curriculum.
  d.  Received accreditation for Master course at both PC universities.
  e.  Establishing a detailed plan for publications.
  f.  Established plan for professor training program.
  g.  Established plan for students training program
  h.  Prepared complete information for the tender for equipment at both PC universities.
  i.  One professor training trip realized.
  j.  Three consortium representatives' meeting held (Southampton, Niš and Ohrid).

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## Coherence with the workplan and comments on deviations and modifications

Please write in this section any change occurred in comparison with the original plans described in the proposal.

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No deviations, just the delay of 8 months caused by the revision of the grant agreement.

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## Development of training programme

Please provide a description of the teaching/training programme(s) (undergraduate programmes, postgraduate programmes, intensive courses, training modules to university or non-academic staff, etc.) that the consortium is developing, the state of play of these developments and introduction of the programmes at the time of submitting the report.

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The both PC universities received the accreditation from their corresponding Ministries for developed SoC Master Courses. The completely new master course is developed at Skopje University while the existing course at Niš University is renewed. The enrolment of students is under way for the school year 2008/2009.

The description of the courses is given bellow and their respective presentations are available at Tempus Web pages of both PC universities.

**Niš: Study program plan and courses for SoC**

  **COMMON BASIS FOR MODULES:**
  ELECTRONIC DEVICES AND MICROSYSTEMS and
  ELECTRONICS AND MICROPROCESOR TECHNIQUES

  **ACTIVE CLASSES:**
  COMPULSORY
  Teaching = 4
  Exercise = 2
  ESCT = 8

  **MODULE:** ELECTRONIC DEVICES AND MICROSYSTEM
  ELECTIVE: Teaching= 10 Exercise = 5 Other = 20
  Elective     20 ECTS
  Research study work 14 ECTS
  Final Exam    18 ECTS
  +++++++++++++++++++++++++++++++
  Common     8 ECTS
  **Total**      **60 ECTS**

  **MODULE:** ELECTRONICS AND MICROPROCESOR TECHNIQUES

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ELECTIVE Teaching = 10 Exercise = 9 Other = 20
Elective              20  ECTS
Research study work  14  ECTS
Final Exam           18  ECTS
++++++++++++++++++++++++++++++++
Common                8  ECTS


Total                60  ECTS
```

**Table 1.1** Course distribution within the semesters for the **masters** study program ELECTRONICS AND MICROPROCESSOR TECHNICS (fifth year)

| No. | Cipher* | Name | Semester | Classes | Exercises | Other forrms of teaching (OFT) | Research and study work | ECTS | Compulsory (Co)/ Elective (El) |
|---|---|---|---|---|---|---|---|---|---|
| 1. | MEM1O01 | System on chip | 1 | 2 | 1 | 0 | | 4 | Co |
| 2. | MEM1O02 | Microsensors and mikrosystems | 1 | 2 | 1 | 0 | | 4 | Co |
| 3. | SI1 | Research and study work | 1 | | | | 10 | 7 | |
| | | Module ELECTRONIC COMPONENTS AND MICROSYSTEMS (EKM) | | | | | | | |
| 4. | MEM1A00 | Elective block DEKM 1 | 1 | 6 | | | | 12 | El |
| 5. | MEM2A00 | Elective block DEKM 2 | 2 | 4 | | | | 8 | El |
| | | Module ELECTRONICS AND MICROPROCESSOR TECHNIQUE (EMT) | | | | | | | |
| 6. | MEE1A00 | Elective block DEMT 1 | 1 | 2 | | | | 4 | El |
| 7. | MEE1B00 | Elective block DEMT 2 | 1 | 2 | | | | 4 | El |
| 8. | MEE1C00 | Elective block DEMT 3 | 1 | 2 | | | | 4 | El |
| 9. | MEE2A00 | Elective block DEMT 4 | 2 | 2 | | | | 4 | El |
| 10. | MEE2B00 | Elective block DEMT 5 | 2 | 2 | | | | 4 | El |
| 11. | SI2 | Research and study work | 2 | | | | 10 | 7 | |
| 12. | MEE2O01 | Diploma work | | | | | | 18 | |
| | TOTAL ACTIVE TEACHING FOR **EKM** MODULE | | | 14 | 7 | | 20 | 42 | |
| | TOTAL ACTIVE TEACHING FOR **EMT** MODULE | | | 14 | 11 | | 20 | 42 | |
| | MEE2O01 | Diploma work | 2 | | | | | 18 | |
| | | | | TOTAL ECTS for the **EKM** MODULE | | | | 60 | |
| | | | | TOTAL ECTS for the **EMT** MODULE | | | | 60 | |

* The cyphers of the subjects and shortcuts for the modules are not translated in English except for the transition from cyrilic to latin alphabet

**Table 1.1A (addendum) Extract for System on Chip diploma**

| Cipher | Name | Semester | Teaching Classes | Exercises | Other forrms of teaching (OFT) | Research and study work | ECTS | Compulsory (Co)/ Elective (El) |
|---|---|---|---|---|---|---|---|---|

| MEM1O01 | System on chip | 1 | 2 | 1 | | | 4 | Co |
|---|---|---|---|---|---|---|---|---|
| MEE1A02 | Mixed signal circuits design | 1 | 2 | 2 | | | 4 | El |
| MEE1B02 | Design of RF integrated circuits | 1 | 2 | 2 | | | 4 | El |
| MEE1C04 | Intelligent mashines | 1 | 2 | 2 | | | 4 | El |
| SI1 | Research and study work | | | | 10 | | 7 | |
| MEE2A02 | Simulation and optimization of electronic circuits | 2 | 2 | 2 | | | 4 | El |
| MEE2B01 | Modelling of electronic circuits and systems | 2 | 2 | 2 | | | 4 | El |
| MEE2B02 | Design of electronic equipment | 2 | 2 | 2 | | | 4 | El |
| SI2 | Research and study work | | | | 10 | | 7 | |
| | Diploma work | | | | | | 18 | |

**Table 1.2** Specification of the course MEE1O01

| Program of study : | Electronics and microprocessor technique |
|---|---|
| Kind and level of study: | Diploma academic studies |

| **Name of the course:** | System on chip (SoC) |
|---|---|
| **Teacher:** | Vančo B. Litovski |
| Status of the course: | Compulsory |
| Number of ECTS: | 4 |
| Precondition: | none |

**Course objectives :** To transfer to the students the fundamental knowledge on the problems of building systems on chip, on the architectures and design of SoCs.

**Course outcome**
Acquirement of competence for design of specific integrated circuits containing all elements of a system including aspects that accompany such a complex problem. One expect the student to learn the methods of building such systems, problems that are related to such problems specifically, methods of overcoming the fundamental design obstacles, and design methods related to production of such systems.

**Course content:** Overview of the architectures of digital systems. Basic trade-offs in IC design: area, speed, power consumption seen from the point of view of choice of architecture including width of the bus and noise margins. Interconnect models using lumped and distributed circuits. Signal delay, losses and reflection. Crosstalk. Sensitivity to noise. Measures to protect the signal integrity. Feedback-loop signal-ground. Cross coupling between lines connected to different power supplies. Distribution different power supply levels. Strategies for uniform power consumption density over the chip. Control of power supply on the chip. Control of the subsystems in the sleep mode. Internal oscillator. Design for testability. Design for manufacturability. Design flow of SoC. Implementation of IP cores use as parts of the SoC. Guard rings. Example of SoC design based on macro-cells (ADC, DSP, DAC, PLL, ...).
A team project is planned within this course. It is expected to implement the **Mentor Graphics** design technology. It should start with functional description and end with a layout description expressed in GDSII format. The project is running during whole semester.

**Literature**
- Dokić, B., „Integrated circuits", Faculty of Electronic Engineering in Banja Luka, 1999 (in Serbian).
- Baker, R.J., "*CMOS Mixed-Signal Design*", IEEE Press. Piscataway, NJ, USA, 1998
- Wolf, W., "*Modern VLSI Design: System-on-Chip Design*", Prentice Hall, N.Y., USA, 2006
- Damnjanović, M., „*Laboratory guide for design and testing of electronic circuits and systems*", Faculty of Electronic Engineering, Niš, 2000 (in Serbian).
- http://leda.elfak.ni.ac.yu/education/SOC/

| **Number of active teaching hours** | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercises: 2 | Other forms of teaching 1 | Research study work: | |

**Methods of teaching**
Classroom teaching using e-beam projector, Auditory excerzizes, laboratory work on a computer, Consultations, individual and collective projects.

| **Evaluation of the knowledge (Maximum number of points 100)** | | | |
|---|---|---|---|
| **Pre-examine duties** | **points** | **Final examine** | **points** |
| Activity during teaching | 5 | Personal defense of the project | 30 |

| | | | | |
|---|---|---|---|---|
| Colloquium | 25 | | | |
| Project | 30 | | | |
| Laboratory work Evaluation | 10 | | | |
| $\sum$ | **70** | $\sum$ | | **30** |

**Table 1.3** Specification of the course MEE1O02

| | |
|---|---|
| Program of study : | Electronics and microprocessor technique |
| Kind and level of study: | Diploma academic studies |
| **Name of the course:** | System on chip (SoC) |
| **Teacher:** | Janković D. Nebojša |
| Status of the course: | Compulsory |
| Number of ECTS: | 4 |
| Precondition: | none |

**Course objectives**
To gain understanding in the basic concepts in design, fabrication and operation of integrated microsensor devices, as well as their implementation in measurement microsystems based on microcontroller's technology.

**Course outcome:**
It is expected that the students attending this course will be able to design and realize its own operational basic sensory microsuystem using a microcontorller's development kit and sensor device..

**Course content:**
*Lactures:*
Introduction to microsensors and microsuystems. Principals and operation of integrated microsensor devices: temperature, optical, magnetic, CCD, motion, chemical and biological sensors. Microsystems design. Microsensors and microcontrollers. Interfacing microsensors and microcontrollers. Analog-digital conversion. Time domain sensory signal processing. Software approach in sensor control and sensory data processing. Multisensor communication protocols and microcontroller peripherals.
*Lab course:*
In laboratory work, students will be trained to use and program chosen microcontrollers including the design of some basic sensory microsystems for various measuring physical signal domains.

**Literature**
- Gardner J., Varadan V., Awadelkarim O.: *Microsensors, MEMS and smart devices: technology, applications & devices ,* Wiley, UK (2001)
- Fraden J., *Handbook of modern sensors: Physics, designs and applications,* Springer-Verlag, (2004),
- M.Popović, *Sensors and Measurements (in Serbian),* Viša elektrotehnička škola, Beograd, (2000)
- N. Janković *Practicum for course Sesors and Transducers* (in Serbian), Elektronski Fakultet Niš (1995)
- Internet

| **Number of active teaching hours** | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercises: 1 | Other forms of teaching 1 | Research study work: | |

**Methods of teaching**
Classroom teaching using e-beam projector, Auditory exercises, laboratory work on a computer, Consultations, individual and collective projects.

| **Evaluation of the knowledge (Maximum number of points 100)** | | | |
|---|---|---|---|
| **Pre-examine duties** | **points** | **Final examine** | **points** |
| Activity during teaching | 10 | Personal defense of the project | 40 |
| Colloquium | | | |
| Project | | Project | 20 |
| Practice | 10 | Laboratory work Evaluation | 20 |
| $\sum$ | **20** | $\sum$ | **80** |

**Table 1.4** Specification of the course MEE1A02

| | |
|---|---|
| Program of study : | Electronics and microprocessor technique |
| Kind and level of study: | Diploma academic studies |
| **Name of the course:** | **Mixed signal IC design** |
| **Teacher:** | Predrag M. Petković |
| Status of the course: | Elective |
| Number of ECTS: | 4 |
| Precondition: | none |

**Course objectives :** Acquirement of competence for design of specific integrated circuits with digital and analog signals with special emphasys on the signal distribution and its integrity.

**Course outcome:** Acquirement of competence for design of specific integrated circuits with mixed signals. One expects the student to learn do design transistor dimensions for both analog and digital parts of the system and to use computer programs for verification and physical design of ICs. In addition they are expected to learn how to present the designers results.

**Course content:** Fundamental and advanced CMOS processes. Properties, structure and performances of the mixed signal circuits. Structure of the Switched capacitor (SC) circuit. SI-circuits. Σ-Δ modulators. Design of the converter's building blocks in CMOS (operational amplifier, integrator/filter, band-gap reference, quantyzer). MASH archtecture. Signal integrity protection at the structural and physical level. Clock routing. Power supply routing. Thermal effects. Design of guard rings. Tollerances and mismatch influences. Techniques to avoid mismatch. Design rule verification (electrical and physical). Design for testability. Using the ***Mentor Graphics*** design set of tools, the students work an individual and one team project.

**Literature**
- Petković, P., Sokolović, M., and Anđelković, B., *"Integrated circuits design"*, Faculty of Electronic Engineering Niš & WUS Austria, 2005, Internal publication ISBN 86-85195-09-8
- Baker, J. R., *CMOS Mixed-Signal Circuit Design*, IEEE Press, Wiley & Sons, Inc., 2002, ISBN 0-471-22754-4
- Baker M., *Demystifyng Mixed-Signal Test Methods,* Elsevier Science, 2003, ISBN 0-7506-7616-7
- preda http://leda.elfak.ni.ac.yu/education/PIKMS/

| Number of active teaching hours | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercizes: | Other forms of teaching 1 | Research study work: 3 | |

**Methods of teaching**
Classroom teaching using e-beam projector, laboratory work on a computer, Consultations, individual and collective projects.

| Evaluation of the knowledge (Maximum number of points 100) | | | |
|---|---|---|---|
| **Pre-examine duties** | **points** | **Final examine** | **points** |
| Activity during teaching | 10 | Exam over the project | **30** |
| Project | 30 * 2 | | |
| $\sum$ | **70** | $\sum$ | **30** |

**Table 1.5** Specification of the course MEE1B02

| | |
|---|---|
| Program of study : | Electronics and microprocessor technique |
| Kind and level of study: | Diploma academic studies |
| **Name of the course:** | **Design of RF integrated circuits** |
| **Teacher:** | Dragiša P. Milovanović |
| Status of the course: | Elective |
| Number of ECTS: | 4 |
| Precondition: | Examine of: RF electronics |

**Course objectives :** Broaden the knowledge on RF circuit design

**Course outcome:** Ability to design RF circuits

**Course content:** Theoretical teaching: 2/3 D simulation of processes and components. Behaviour of semiconductor structures. PSP: MOSFET model based on surface potential. EKV3.0: Improved model of the transistor based on charge transfer. Compact model of CMOS for next generation design. Modeling based on parameter measurements at high frequencies. Empirical FET models. Modeling of the nonlinearity of SOI MOSFET-a. RF modeling and design at circuit level. Incorporation of parasitic quantum effects into the classical circuits.

| Practical teaching: Auditory and laboratory exercises, consulting, Semestral projects. | | | | |
|---|---|---|---|---|
| **Literature:** Wladyslaw Grabinski, Bart Nauwelaers and Dominique Schreurs, Transistor Level Modeling for Analog/RF IC Design, 2005. | | | | |

| **Number of active teaching hours** | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercizes: 2 | Other forms of teaching | Research study work: 2 | |

| **Methods of teaching** |
|---|
| Classroom teaching using e-beam projector, Auditory exercizes, laboratory work on a computer, Consultations, individual and collective projects. |

| **Evaluation of the knowledge (Maximum number of points 100)** | | | | |
|---|---|---|---|---|
| **Pre-examine duties** | **points** | **Final examine** | **points** | |
| Activity during teaching | 10 | Problem solving examine | 20 | |
| Colloquium | 20 | Theoretical knowledge examine | 20 | |
| Project | 10 | | | |
| Laboratory work Evaluation | 20 | | | |
| $\sum$ | **60** | $\sum$ | **40** | |

**Table 1.6** Specification of the course MEE1C04

| Program of study : | Electronics and microprocessor technique | |
|---|---|---|
| Kind and level of study: | Diploma academic studies | |
| **Name of the course:** | **Intelligent machines** | |
| **Teacher:** | Goran S. Djordjević | |
| Status of the course: | Elective | |
| Number of ECTS: | 4 | |
| Precondition: | none | |

| **Course objectives :** Principles of functioning and design of machines that have intelligent communication with the surroundings and specifically with human. |
|---|
| **Course outcome:** Understanding the motives for design of machines based on the principles of artificial intelligence based on the perception, cognition and execution aspect. Organization of intelligent machines especially robots. |
| **Course content:** Definition of intelligent system and sub-system. Definition of mechanical intelligence. Intelligence in decision making. Difference between natural systems and machines. Movement and manipulation as a base for intelligence development. Design of mechanisms by functional imitation of natural solutions. Biomimetics. Functional robustness of mechanical solution aiming simplification of control. Intelligent drive as a functional copy of natural way of movement. Actuators integrated with sensors and controllers as the simplest level of control. Methods and techniques of modeling interactions. Parametric and non-parametric models. Forming a controller with an integrated model. Examples of intelligent machines with emphasis on walking, seizing, uplift and collision. |
| **Literature:**<br>- Notes and slides of ppt presentations posted at the faculty's web page.<br>- Convenient published papers accomodated to student intrest. |

| **Number of active teaching hours** | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercizes: 1 | Other forms of teaching | Research study work: | |

| **Methods of teaching** |
|---|
| Classroom teaching using e-beam projector, Auditory exercizes, Consultations. |

| **Evaluation of the knowledge (Maximum number of points 100)** | | | | |
|---|---|---|---|---|
| **Pre-examine duties** | **points** | **Final examine** | **points** | |
| Activity during teaching | 10 | Oral examine | **40** | |
| Project | 50 | | | |
| $\sum$ | **60** | $\sum$ | **40** | |

**Table 1.7** Specification of the course MEE2A02

| | |
|---|---|
| Program of study : | Electronics and microprocessor technique |
| Kind and level of study: | Diploma academic studies |
| **Name of the course:** | **Simulation and optimization of electronic circuits** |
| **Teacher:** | Predrag M. Petković |
| Status of the course: | Elective |
| Number of ECTS: | 4 |
| Precondition: | none |

**Course objectives :** Acquirement and systematization of knowledge on the algorithms for analysis and optimization of analog circuits and simulation of digital and mixed-signal circuits.

**Course outcome:** Acquirement competence for analysis, simulation and optimization to the extent to become able to develope software for these purposes.

**Course content:** Analog circuit simulation: abstraction domains, DC, sinusoidal, time domain. Simulation algorithms. Simulation of linear circuits., Simulation of nonlinear resistive circuits. Simulation of linear dynamic circuits. Simulation of nonlinear dynamic circuits. Specifics of simulation in seoparate domains. Models of the fundamental passive and active components. Simulation of digital circuits (selective trace and next event principle). Simulation with discrete events. Misxed signal simulation. Methods for power and delay estimation. Optimization of electronic circuits. Meanning and importance of the weighting function. Optimization algorithms. Simulated annealing. Evolutionary algorithm. Constrained optimization. Deterministic and statistical tolerance analysis. Within this course laboratory work is planned based on teaching of application of **SPICE** simulator and **Optimizer** as parts of the **OrCAD** design package.

**Literature: -** Litovski, V., "Design of electronic circuits", Nova Jugoslavija, Vranje, 2000, ISBN 86-7369-015-3.
- Litovski, V. and Zwolinski, M., "VLSI circuit simulation and optimization", Chapman and Hall, London, 1997.
-  http://leda.elfak.ni.ac.yu/education/SOEK/

| **Number of active teaching hours** | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercizes: 2 | Other forms of teaching 1 | Research study work: | |

**Methods of teaching**
Classroom teaching using e-beam projector, Auditory exercizes, laboratory work on a computer, Consultations, individual and collective projects.

| **Evaluation of the knowledge (Maximum number of points 100)** | | | |
|---|---|---|---|
| **Pre-examine duties** | **points** | **Final examine** | **points** |
| Activity during teaching | 10 | Exam related to the project | **30** |
| Project | 2*30 | | |
| $\sum$ | **70** | $\sum$ | **30** |

**Table 1.8** Specification of the course MEE2B01

| | |
|---|---|
| Program of study : | Electronics and microprocessor technique |
| Kind and level of study: | Diploma academic studies |
| **Name of the course:** | **Modeling of the components of electronic circuits and systems** |
| **Teacher:** | Vančo B. Litovski |
| Status of the subject: | Elective |
| Number of ECTS: | 4 |
| Precondition: | none |

**Course objectives :** Acquaring and systematization of knowledge on modelling of elements of electronic circuits and systems starting with the level of semiconductor devices and ending with macromodels at system level.

**Course outcome:** Acquaring competnce for creation of both physical and black-box models.

**Course content:** Introduction to modeling. Properties of the models of electronic components. Modeling methods. Black-box approach. Physical approach. Hierarchy of the models. Small signal models. Local models. Global models. Accuracy of the models. Models of specific semiconductor devices including pnpn structures. Macromodels of analog cells. Macromodels of digital cells. Synthesis of macromodels. Modelling of noise. Modelling of nonlinear transducers.

| | |
|---|---|
| Laboratory exercises are planned based on implementation of SPICE simulator. | |

**Literature: Literature: -** Litovski, V., "Design of electronic circuits", Nova Jugoslavija, Vranje, 2000, ISBN 86-7369-015-3.
- Litovski, V. and Zwolinski, M., "VLSI circuit simulation and optimization", Chapman and Hall, London, 1997.
- http://leda.elfak.ni.ac.yu/education/SOEK/

| **Number of active teaching hours** | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercizes: 1 | Other forms of teaching | Research study work: 3 | |

**Methods of teaching**
Classroom teaching using e-beam projector, Auditory exercizes, laboratory work on a computer, Consultations, individual and collective projects.

| **Evaluation of the knowledge (Maximum number of points 100)** | | | |
|---|---|---|---|
| **Pre-examine duties** | **points** | **Final examine** | **points** |
| Activity during teaching | 10 | Exam related to the project: | **40** |
| Project | 50 | | |
| $\sum$ | **60** | $\sum$ | **40** |

**Table 1.9** Specification of the course MEE2B02

| Program of study : | Electronics and microprocessor technique |
|---|---|
| Kind and level of study: | Diploma academic studies |
| **Name of the course:** | Electronic Equipment Design |
| **Teacher:** | Jevtić S. Milun |
| Status of the course: | Elective (Common) |
| Number of ECTS: | 4 |
| Precondition: | Digital electronics |

**Course objectives :** To transfer to the students the knowledge needed for design of safe electronic equipments

**Course outcome**
Acquirement of competence for design of safe electronic equipment by the use of required software and hardware tools.

**Course content:**
*Theory:* Principles for design of electronic equipment based on computers. Methodology of hardware/software co-design. Object oriented microcomputer based systems design. Design development tools. Embedded operating systems. Programmability of electronic equipment. Design for equipment safety. Design of failure detection systems and fault tolerant systems. Redundancy in hardware, software, data and time. Testing and failure diagnostic techniques. Built-in self-testing. Design of equipment that works under hazardous conditions – self-safe equipment. Design of high-reliable real-time systems under rigid time constrains. Electromagnetic Compatibility of electronic equipment.
*Practice: Students use design tools and accessories in laboratory and do a project:* Theoretical knowledge students enlarge practicing design techniques using design tools. It is expected to design and prototype an equipment.

**Literature**
Jevtić, M. *Design of reliable microcomputer systems*, Monography, Elektronski fakultet u Nišu, 2004. (in Serbian).
Jevtić, M. *Scripts and ppt presentations* (in Serbian).
Quing Li, Caroline Yao, *Real-Time Concepts for Embedded Systems*, CMP Books, 2003.
Damnjanović, M. et.al., „*Laboratory guide for design and testing of electronic circuits and systems*", Faculty of Electronic Engineering, Niš, 2000 (in Serbian).

| **Number of active teaching hours** | | | | Other teaching hours |
|---|---|---|---|---|
| Teaching: 2 | Exercises: 2 | Other forms of teaching | Research study work (RSW): 2 | |

**Methods of teaching**
Classroom teaching using e-beam projector, Auditory exercises, laboratory work on a computer, Consultations,

| individual and collective projects. | | | |
|---|---|---|---|
| **Evaluation of the knowledge (Maximum number of points 100)** | | | |
| **Pre-examine duties** | **points** | **Final examine** | **points** |
| Activity during (RSW) | 10 | Auditory exam | 20 |
| Colloquium | 20 | Project | 30 |
| Practice | 20 | | |
| $\sum$ | **50** | $\sum$ | **50** |

**Skopje: Study program plan and courses for SoC**

**Table 2.1 Study program plan (courses)**

| No. | Title | Semester | Credits | | Classes |
|---|---|---|---|---|---|
| 1. | **System on chip design techniques** | **IX** | **5** | | **2+0+2+1** |
| 2. | **Integrated circuits design** | **IX** | **5** | | **2+0+2+1** |
| 3. | **Embedded computer systems software development** | **IX** | **5** | | **2+0+2+1** |
| 4. | Specialization elective course | IX | 5 | | **2+0+2+1** |
| 5. | Specialization elective course | IX | 5 | | **2+0+2+1** |
| 6. | Specialization elective course | IX | 5 | | **2+0+2+1** |
| 7. | **Analog and combined signals design** | **X** | | 5 | **2+0+2+1** |
| 8. | Specialization elective course | X | | 5 | **2+0+2+1** |
| 9. | Masters thesis | X | | 20 | |
| | **TOTAL** | | **30** | **30** | |

**Table 2.2 Specialization elective courses (disciplines)**

| No. | Title | Semester | Credits | | Classes |
|---|---|---|---|---|---|
| 1. | Wireless and ad hoc computer networks | IX | 5 | | **2+0+2+1** |
| 2. | Contemporary methods for network analysis | IX | 5 | | **2+0+2+1** |
| 3. | Digital system design using HDL | IX | 5 | | **2+0+2+1** |
| 4. | System reliability | IX | 5 | | **2+0+2+1** |
| 5. | Collaborative computer systems | IX | 5 | | **2+0+2+1** |
| 6. | Digital electronic system design | X | | 5 | **2+0+2+1** |
| 7. | Custom purpose networks | X | | 5 | **2+0+2+1** |
| 8. | Cryptography | X | | 5 | **2+0+2+1** |
| 9. | Process computers | X | | 5 | **2+0+2+1** |
| 10. | Nanotechnology | X | | 5 | **2+0+2+1** |

**Table 2.3. Courses description**

| Study discipline | Embedded computer systems software development | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| X | **Compulsory** | 2+0+2+1 | 5 | | CTI |
| Prerequisites | | | | | |
| Competence | Embedded operating systems - use and development. Embedded systems software development | | | | |
| Syllabus | **Embedded operating systems:** Embedded Linux, Windows CE, PALM OS. **Interfaces:** Types of interfaces. Using interrupts for timing, System integration. **Network embedded systems:** Examples of network embedded systems. **Embedded systems programming in C:** Reading port pins and mechanical switches, adding code structure, real time limitations, creating embedded operating systems, using the serial interface. **Java 2, Micro Edition** (J2ME): Configurations, Connection limited device configuration – CLDC, CDC profiles, J2ME wireless tools. **Small devices design:** Limited calculation capacity, Limited screen size, Limited memory. **User interface:** Mobile Information Device Profile (MIDP). **Information storage:** Information storage using MIDP, RMS API, Java databases. **Networking:** Palm device network environment, Generic Connection Framework, Palm device Internet access, PocketPC network connections. | | | | |

| Study discipline | Integrated circuits design | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| IX | **Compulsory** | 2+0+2+1 | **5** | | **E** |
| Prerequisites | | | | | |
| Competence | Analysis of digital CMOS circuits and projecting simple logical gates. | | | | |
| Syllabus | **Integrated circuits**. CMOS processing, topology and projection rules. STIK diagrams. **Characteristics of the CMOS technology**. Inverted converter, transfer characteristics, transitive characteristics, noise margins, propagation time, power consumptiuon, SPICE simulation. **CMOS circuits**. Logical circuits. Transmission ports and three state circuits. Memory elements. Dynamic logic. PLA-structures. | | | | |

| Study discipline | System on chip design techniques | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| IX | **Compulsory** | 2+0+2+1 | 5 | | CTI |
| Prerequisites | | | | | |
| Competence | Using the System-on-Chip development methodology. Platform dependent components development (network, video interface, wireless communication) | | | | |
| Syllabus | Introduction to embedded computer systems. History and overview of embedded systems. System-on-chip design. Embedded computer systems architectures. System design models and methodologies. Hardware and software distribution. Embedded computer systems design. System-on-Chip modeling and simulation. Function-architecture code design. Destination platform based design. Architecture mapping. Hardware description languages. (Verilog HDL, VHDL, SystemC). Design verification and embedded system testability. System-on-Chip (SoC) and IP-cores. Using IP-cores for system-on-chip design. Energy efficient embedded systems design techniques. General Inpu/Output. Serial communication (I2C, SPI IrDA, Uarts). Analog Input/Output. Hardware-software interfaces and reconfigurable calculations. Embedded computer systems communication parts design. Interface synthesis. | | | | |

| Study discipline | Analog and combined signals design | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| X | **Compulsory** | 2+0+2+1 | 5 | | E |
| Prerequisites | | | | | |
| Competence | Active and passive components in CMOS and their parasite elements when modelling transistors for starting handmade design and boundary of applicability. Designing basic primitives of analogue circuits. Design of CMOS Op-Amp. Practical problems with A/D and D/A converters with voltage and current scaling. | | | | |
| Syllabus | Review of modeling devices with CMOS processing; Moulding passive components and their parasites; Moulding MOS transistors with big and small signals. Basics of CMOS amplifiers; Reinforcement and throughput; Cascade degrees; Diferential amplifier; Device compatibility. Current and voltage sources; Basic current mirrors; Current mirrors with high performances; Simple voltage references. CMOS operational amplifiers; General considerations; Simple two-stage architecture; Stability and compensation of dominant pole; Output buffers; One-stage amplifiers; Complete differential amplifiers. Noise within MOS circuits; General considerations; Thermal 1/f device noise; Amplifier's noise; Noise within amplifier degrees; Stabilizing chopper for 1/f noise; kT/C noise. Circuits for data conversion; General considerations; Simple current and voltage scaling in D/A; Comparators; Integral A/D; A/D with charge redistribution; Flash A/D; Sigma-Delta A/D. Filters with switching capacitor; Filters with continual time. | | | | |

| Study discipline | Process computers | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| X | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence | | | | | |
| Syllabus | Review of basic process physical measures which are subject of measurement. Interface for receiving signals from transducers. Processing the signals from the transducers. Standard architectures of system buses in process computers. 8-bit and 16-bit microcontrollers, Memory, I/O, assembly programming. Computer networks in industry conditions. Applications in the industry conditions. Real-time work. Student projects. | | | | |

| Study discipline | System reliability | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| IX | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence* | Analysis of system reliability. Designing a highly reliable systems.  Analysis and modeling software reliability.  Designing highly reliable software. | | | | |
| Syllabus | Definition and measures for reliability and availability. Reliability and modeling availability. Error detection and error correction codes. Design of confidential system: transient vs. permanent hardware errors. Sources of errors in software, error tolerance techniques, VLSI devices confidentiality . air control systems confidentiality, telecommunication system, application for industry control confidentiality. **Software approaches and software confidentiality.** Models for software reliability. Methods for software reliability. Data bases and distributive system confidentiality. **Design of tests.** Methods for tests generation.  Automatic Test Pattern Generation (ATPG). System level tests and diagnosis. Software testing. Test specifications. Black box testing. White box testing. Random tests. Test coverage. **Maintenance**. Analysis of risks and danger exposure, risk reducing strategies. Inevitability of maintenance of certain systems. Schemas for behavior  related to maintenance – hardware, software, communication. Nature of maintenance: fixing  a defect, rebuilding, improving. Configuration management and version control in engineering systems. Tools support. Expertise building, later reuse, problems, balances, possibilities. | | | | |

| Study discipline | Wireless and ad-hoc computer networks | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| IX | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence* | Knowledge of characteristics of wireless and ad-hoc networks. | | | | |
| Syllabus | Wireless communication systems. Standards for wireless networking. Review of 802.11 wireless networks. 802.11 MAC. 802.15. Personal wireless networks. 802.16. Broad band wireless networks. Ad hoc wireless networks. Sensor networks. Protocols. Quality of service and multimedia support. Mobile IP. Wireless networks security. | | | | |

| Study discipline | Dedicated networks | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| X | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence* | Knowledge of  different kinds of dedicated networks in different fields. Dedicated networks projecting. | | | | |
| Syllabus | Fields where dedicated networks are of a great use. Air navigation networks: civil and military. Airplane networks: civil and military. Optical networks. Industry networks. Software for dedicated networks. Dedicated networks security. | | | | |

| Study discipline | Projecting of digital electrical circuits | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| X | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence* | Knowledge of  different languages and environments for projecting digital circuits. Projecting digital circuits. | | | | |
| Syllabus | Languages for description of digital circuits. Environments for projecting and development of digital integrated circuits. Practical examples of projecting integrated circuits. | | | | |

| Study discipline | Cryptography | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| X | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence* | | | | | |
| Syllabus | Elements of number theory. Elements of algebra (finite fields, Gaola fields. Elements of complexity theory (algorithmic complexity and probability, computing complexity and probability). Algorithms with secret keys (symmetric algorithms). Example: AES. Algorithms with public keys. Example: RSA. Pseudo-randomness. | | | | |

| Study discipline | Contemporary methods for network analysis | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| IX | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence* | Knowledge of contemporary methods for network analysis. | | | | |
| Syllabus | Network analysis (Min-Plus algebra applied in queuing systems in computer/communication networks). Stochastic analysis of networks. Example: analysis of TC/IP protocol. Elements of networks optimization theory. Maximizing the network fluctuations for usability. Elements of game and network theory. Network coding. Random networks. Example: calculating capacity of wireless networks. | | | | |

| Study discipline | Nanotechnology | | | | |
|---|---|---|---|---|---|
| **Semester** | **Type** | **Classes** | **Credits** | **Language** | **Institute** |
| IX | **Elective** | 2+0+2+1 | **5** | | **CTI** |
| Prerequisites | | | | | |
| Competence* | Knowledge of characteristics and fabrication of micro and nano-elements, especially with the technology of sillicium integrated circuits. Understanding of dimension impact on physical characteristics of elements and capability of performing basic calculations of their parameters. | | | | |
| Syllabus | Introduction. Materials and processes. Crystals, ionic implantation, diffusion, oxidation, lithography, deposition, decay. **Nanostructures**. FIB-systems, nanotubes and wires, photon crystals, hetero structures and quantum pits. **Integration of technologies.** BiCMOS – process, integrated optoelectronics. **MOS-condensator. Modern MOS-transistors.** Shallow source and drain. Materials with large dielectric constant. Overtensed Si and SiGe. SOI-structures. | | | | |

**New/Restructured institutions**

Please provide information on the institutional changes that the project aims to introduce in the partner country consortium institution(s). Examples: establishment of units, new faculties, upgrade and/or establishment of libraries, establishment and/or restructuring of international relation offices and such like. If this entry is not relevant for your project, please write 'Not Applicable'.

Although this issue in general is not applicable to our project, we consider that the establishment of the SoC teaching laboratory is of importance for the general community as an example how the masters study and research level of education may be supported.

**Staff (re-)training**

Please provide a description of the activities carried out and/or planned to be carried out in order to train the staff of the partner country consortium institution(s). Please provide also an outline of the selection criteria for the different groups of persons that have participated and/or will participate in the development of these activities.

Staf (re-)training is related to all technical aspects related of the curricula and laboratory equipment listed in the previous sections as well as general teaching issues as developing teaching skills, finding and using learning resources from the Web, improving feedback from students etc.

Selection criteria are based on teaching capabilities, expertise, language skills, previous experience with PC institutions etc.

Due to the delay of 8 months for the approval of revised grant agreement, the accelerated and updated plan on staff (re-)training is defined and approved at the consortium meeting in Ohrid (Macedonia, Sep 29th - Oct 5th, 2008).

The 15-day professor stays will be carried out in the second semester of the 2008-2009 schoolyear. Each PC center will receive two professors from each EC university. That is at least 8 staff flows and this number can be increased according to the cost of other travels (meetings, workshops).

**Staff mobility**
Please provide an outline of the staff mobility scheme and the selection criteria for the different groups of persons that have participated and/or will participate in mobility flows. Please describe how dissemination activities have been or will be organised by home institution and explain how mobility helped and/or will help in achieving the project objectives. Information about how the home institutions recognise the mobility should also be provided. If unforeseen changes in your original plan occurred, please indicate the type of changes and the measures taken to address them.

The selection criteria on the staff are such that the quality is ensured and the long lasting of the SoC courses are guaranteed at the target institutions. PC professors will stay in EU centres to observe teaching practices (including lecture delivery, laboratory work and project supervision) and monitoring (including examination procedures, formative assessment and staff appraisal). The teaching assistants will observe and participate in teaching and monitoring activities in the host universities.

This activity was partly realized (only one flow was carried out) due to the 8 months delay for the approval of revised grant agreement. The accelerated and updated plan on staff mobility is defined and approved at the consortium meeting in Ohrid (Macedonia, Sep 29th - Oct 5th, 2008).

The one-month staff stays will be carried out in the second semester of the 2008-2009 schoolyear. Each EU center will receive two professors from Niš University and one professor from Skopje University. That is at least 6 staff flows and this number can be increased according to the cost of other travels (meetings, workshops) or making shorter stays.

**Student mobility**
Please provide an outline of the student mobility scheme and the selection criteria for the different groups of persons that participated and/or will participate in mobility flows. Information about how the home institutions recognise the mobility (credit transfer, double diploma, diploma supplement, etc.) should also be provided. If unforeseen changes in your original plan occurred, please indicate the type of changes and the measures taken to address them. Finally, if this entry is not relevant for your project, please write 'Not Applicable'.

The best students are selected for the mobility and their stay cannot formally be recognized but it will be considered as the part on their diploma work. Due to the delay of 8 months for the approval of revised grant agreement, the accelerated and updated mobility plan is adopted at the consortium meeting in Ohrid (Macedonia, Sep 29th - Oct 5th, 2008).

The three-month student stays will be carried out in the second semester of the 2008-2009 schoolyear i.e. in the period from January 15th until July 31st, 2009 as the last day before summer vacations. Each EU center will receive two students from Niš University and one student from Skopje University that makes six 3-month student flows in total.

**Academic co-ordination and administrative management**
Please describe the division of tasks between the various consortium institutions for both aspects concerning academic co-ordination and administrative management. Particular attention should be paid to the description of how this division of tasks will be managed in terms of communication and decision making process. Please also describe your methodology for the day-to-day management of the project activities, indicating what kind of administrative support or other support you have received from your institution. If you encountered difficulties

related to the management of the project, please indicate the type of problems and the solutions identified to address them.

> The division of the tasks among the partners is well defined and it is monitored through frequent communication between all key staff members. The institutions are providing the expected support as it is defined by their internal regulation. The previously encountered delays in communication with the local authorities at university and corresponding ministries are overcome now.

## Equipment

Please provide an outline of the equipment purchased and explain where the equipment has been installed and who has access to it. If this entry is not relevant for your project, please write 'Not Applicable'.

> Both PC centers finalized administrative procedures regarding corresponding authorities in governmental and university bodies. The tender for the equipment purchase at Niš University was published in November 2008 while at Skopje University will probably be done this week. Therefore the equipment is expected to arrive soon at both PC centers.
>
> Niš University Laboratory Equipment is listed in the following section in the form as it is exposed in the tender for its purchase. This is the new version of the equipment that is accorded to the overall institution interest as suggested by the EC.

# UNIVERSITY OF NISH
# FACULTY OF ELECTRONIC ENGINEERING
# IN NISH

# TENDER DOCUMENTATION

## DELIVERY OF COMPUTER EQUIPMENT, MEASURING-ACQUISITION AND DEVELOPMENT EQUIPMENT FOR THE NEEDS OF THE PROJECT TEMPUS- JEP 41107

*You are reading the translation of the original document written in Serbian. The original text was prepared by Zoran Jovanovich a staff member of the Faculty of Electronic Engineering appointed by the Dean of the faculty. The translation was done by Prof. Vancho Litovski member of the TEMPUS JEP 41107 team. This document is conceptually fundamentally different with what was delivered on June 20, 2008, by prof. Litovski to the Dean of the faculty while asking the tender to be published.*

*Translated in Nish on November 28, 2008.*

Nish, on the year 2008.

Based on articles 69, 70. и 72. of the Low of public purchase (Official Journal of Republic of Serbia No. 39/02, 43/03, 55/04 and 101/05)

## THE UNIVERSITY OF NISH,
## THE FACULTY OF ELECTRONIC ENGINEERING IN NISH

**18000 Nish, Aleksandra Medvedeva 14**

**announces**
## A PUBLIC CALL

**For collecting offers in an open procedure for purchase of goods**

Subject of the purchase is computer, measurement-acquisition and development equipment for the needs of realization of the project TEMPUS- JEP 41107 at the faculty of Electronic Engineering in Nish as follows:

**Part 1 – Computer equipment, simulation engine with additional storage system**
**Part 2 – Measurement - acquisition equipment**
**Part 3– Rest of the equipment: video, measurement, development surrounding, material for the student exercise boards and components for testing integrated circuits**

The total value by separate parties 1, 2 and 3 is maximum 54.830,00 Euro in RSD.

Rights to take part are given to all physical and legal entities that are registered for businesses that are subject of this public purchase and satisfy the conditions from paragraphs 45. and 46. of the low of public purchase (Official Journal of Republic of Serbia No. 39/02, 43/03, 55/04 and 101/05).

The offer are to be delivered personally or by post in closed envelopes labeled "Offer for public purchase of goods" to the address of the Faculty of Electronic Engineering in Nish, Aleksandra Medvedeva street, No. 14, 18000 Nish. At the backside of the envelope one should mark the name of the offerer, its address, its telephone, and name of the contact person.

The tender docummentation may be taken in time limit of 15 days starting with the day of the publishing of this Call in the (Official Journal of Republic of Serbia, at the Faculty of Electronic Engineering having an authorization letter and proof of payment of 6.000,00 RSD, to the account of the Faculty of Electronic Engineering No. 840-1721666-89. The paid in advance money may not be refunded, while the Tender documentation may not be taken after the mentioned time limit.

The offer is due to be valid for 60 days starting with the day of application.

The time-limit for delivery of applications is 30 day starting with the day when the Tender was published in the Official Journal of Republic of Serbia, the latest up to 12 o'clock of the last day of the time-limit no matter the way how the applications were sent.

Public opening of the applications will be on the next day of the time limit for application at 12 o'clock, at the Faculty of Electronic Engineering in Nish (room 104 in the dean's office).

The offer for every Part separately must be an original on the form get from the Faculty, clear, unambiguious, complete, typed clearly and signed and sealed by an authorized person. All documents that are ammended to the application must be originals or verified copies not older than 6 months. The price must be expressed in DRS without VAT and is obligatory for the applicant within the time frame of the offer.

Based on the applications delivered , a qualified commision of the Faculty of Electronic Engineerin will select the best offerer while applying the following criteria:

- ➢ Technical characteristics and quality 60 points,
- ➢ Best price 30 point, and
- ➢ Certified service 10 points.

The quantities will be defined by a contract.

In case of inopportune offers the Orderer keeps its right to decide to give the contract for the public purchase for one or all Parts that are subject of the Tender. In

the case the price is unusually low the commission that will be appointed by the Orderer will ask the oferrer to give explanation according to paragraph 57. of the Low of public purchase.

Incomplete, not sealed and not timely applications will not be considered.

Contact person is: Marko Dimitrijevich MSc, room 321, phone 018/ 529-321.

## INSTRUCTIONS
### FOR FILLING THE FORM AND PROOVING THE QUALIFICATION

In **item 1** write in the full name of the offerer
In **item 2**. write in the place and postal code
In **item 3**. write in the business account number
In **item 4**. write in the appropriate form of organization according to the Low of business societies (e.g. action capital society, society with limited responsibility and similar)
In **item 5**. write in the appropriate form of the ownership (e.g. state owned, private, mixed,…)
In **item 6**. write in the company number from the register delivered by the authority for statistics
In **item 7**. write in the registration number given by the authority for registration
In **item 8**. write in the code of the main activity from the register of the appropriate authority
In **item 9**. write in the number, date, and the name of the authority that issued the allowance and amend the allowance of the appropriate authority that is keeping books on the issued allowances for performing the appropriate activities
In **item 10**. give an appropriate response and amend a certificate of the authorized court or register of the appropriate authority that keeps record on the sanctions issued (not older than 6 months)
In **item 11**. give an appropriate answer and amend a certificate, i.e. extract of the court register, or the Agency for business registers or other authority that is keeping books on registration (not older than 6 months)
In **item 12**. amend a certificate from the appropriate tax authority (not older than 6 months)
In **item 13**. give an appropriate answer
In **item 14**. give a list of some biggest buyers
In **item 15**. describe the technical capabilities
In **item 16**. list the capabilities and capacities
In **item 17**. list the standard and amend certificates
In **item 18**. amend photographs, give a detailed description or reference to an appropriate web-site
In **item 19**. amend certificates
In **item 20**. amend an verified photocopy of the income sheet statement for the previous three years
In **item 21**. write in the number of employed persons
In **item 22**. write in the number of employed persons
In **item 23**. give the names of persons
In **item 24**. list the time limits of the delivery from the Offer
In **item 25**. give information on whether a servicing network is in work and list the authorized services with their addresses and telephone numbers
In **item 26**. list the technical and technological advantages with respect to the usual standards
In **item 27**. list the liabilities that can be taken by the offerer in provision of spare parts including information on the ways, time frames, and conditions.
In **item 28**. list the warranty period for any separate item of the equipment
In **item 29**. list the conditions of payment from the offer
In **item 30**. give the name, family name and the function of the person that filled in the questionnaire.
In **item 31**. give the name, family name and the function of the person representing the offerer

## A FORM FOR ESTABLISHING THE QUALIFICATION

| 1.  | Company | |
|-----|---------|--|
| 2.  | Address | |
| 3.  | Bank account | |
| 4.  | Form of organization | |
| 5.  | Form of ownership | |
| 6.  | Company Number | |
| 7.  | Registration Number | |
| 8.  | Cipher of the activity / main activity | |
| 9.  | Allowance of the appropriate authority for doing the activity that is subject of this public purchase | |
| 10. | Proof that against the offerer in the last two years was not issued a valid court or administrative sentence that forbids the offerer to do activities related to the subject of this public purchase | |
| 11. | Proof that the offerer did not stop working based on court or administrative sentence or that he is not deleted from the register of the appropriate authority | |
| 12. | Proof that the offerer acquitted all taxes and public duties in accordance with the running lows | |
| 13. | Did the offerer delivered goods that are subject of this tender | |
| 14. | Give a list of buyers | |
| 15. | A short description of the technical accomplishment | |
| 16. | Capacities for research and development | |
| 17. | Measures undertaken for quality assurance (JUS, ISO 9000 or other standards) | |
| 18. | Possession of description, samples or photographs of the product | |
| 19. | Possession of certificate given by authorized organ or organization for quality control that the offered goods are in accordance with the ruling standards | |
| 20. | income sheet statement for the previous three years | |
| 21. | the number of employed persons | |
| 22. | Number of technical and expert persons that will be responsible for the realization of the contract | |
| 23. | Persons responsible for quality control | |
| 24. | Delivery time limits | |

5

| 25. | Servicing after delivery | |
|-----|--------------------------------------|--|
| 26. | Technical and technological advantages | |
| 27. | Liability in assurance spare parts | |
| 28. | Warranty period | |
| 29. | Payment conditions | |
| 30. | The form filled by | |
| 31. | Responsible person | |

Form filled by:                    P.S..                    Responsible person:

6

# PART I

Computer equipment, simulation engine with additional equipment and storage system of the NAS type with software for host management for the realization of the project TEMPUS-JEP 41107

Subject of the purchase are specified goods and appropriate warranties.
The offerer is due to offer equipment without VAT, while The Faculty of Electronic Engineering takes the duty to issue a certificate for tax acquittal.

REQUIREMENT:
- Time frame and way of payment 60% after delivery, 40 % after establishment of compatibility with the equipment listed in Part 2.
- Time frame of delivery is 30 days.
- Warranties are 3 years
- Maximum total price is 23300 EURO in RSD counter value

SPECIFICATION OF THE GOODS

| | Compulsory requirement | Quanti. | Additional offer | | |
|---|---|---|---|---|---|
| | **Personal computer of type -A** | **8** | | | |
| processor | No. Of cores 2 | | | | |
| | Working frequency 2GHz min. | | | | |
| | Capacity L2-Cache 2MB minimum | | | | |
| | Nominal speed FSB 800MHz min. | | | | |
| Memory | DDRII 1 x 1GB, min 667MHz, by the model and type to be original component of the producer of the computer | | 2GB +1 point | 4GB +2 points | |
| Hard disk | SATA 160GB 5400rpm, by the model and type to be original component of the producer of the computer | | until 250GB: +1point | 250GB and more: +2 points | |
| DVD reader/writer | DVD, SATA, OEM, in original configuration of the producer | | DVD-RW DL + 1point | | |
| LAN | 1000Mbps | | | | |
| mouse | optical min. One weels, OEM of original configuration of the producer | | | | |
| keyboard | PS/2 or USB, OEM original configuration of the producer, standard distribution of the keys. | | | | |
| Monitor | The same trade mark as the computer, the same colour of the shassis as the computer, TFT 19" wide, maks resolution min. 1440x900,800:1,300cd, declassed hor./ver. Viewing angle 165°min/160°min. | | 22" +1point | | |

| Grafic board | PCI-E, with producers declassed hardware support for DirectX 10 | | | | |
|---|---|---|---|---|---|
| **Personal computer of type -B** | | **1** | | | |
| processor | No. Of cores  2 | | 4 cores +2 points | | |
| | Working frequency  2.4GHz  min. | | | | |
| | Capacity   L2-Cache 2MB minimum | | | | |
| | Nominal speed  FSB 800MHz min. | | | | |
| Memory | DDRII  2 x 2GB, min 667MHz,  by the model and type to be original component of the producer of the computer | | | | |
| Hard disk | SATA 360GB 7200rpm,  by the model and type to be original component of the producer of the computer | | Up to 500GB: +1 point | 500GB and more: +2 points | |
| DVD reader/writer | DVD-RW DL, SATA, OEM,  in original configuration of the producer | | | | |
| LAN | 1000Mbps | | | | |
| Mouse | optical min. One weels, OEM of  original configuration of the producer | | | | |
| keyboard | PS/2   or   USB,   OEM   original configuration of the producer, standard distribution of the keys. | | | | |
| Monitor | The same trade mark as the computer, the same  colour  of  the  shassis  as  the computer, TFT 19" wide, maks resolution min.  1440x900,800:1,300cd,    declassed hor./ver. Viewing angle 165°min/160°min | | 22" +1 point | | |
| Grafic board | PCI-E, with producers declassed hardware support for DirectX 10 | | | | |
| **Networking equipment** | | | | | |
| Network cable | UTP cable of category 6 | 200m | | | |
| Socket | Wall mounted network socket category 6 | 16 pieces | | | |
| Patch panel with sockets | 16 port panel category 6 | 1piece | | | |
| Patch cable | Patch kabl cat. 6 3m long | 16 pieces | | | |
| Patch kabl | Patch kabl cat. 6 1m long | 16 pieces | | | |
| Router/fire wall | Ruter/firewall    with a min. 2  100Mb/s Ethernet  port  with  characteristicssimilar to Cisco 1800 | 1piece | | | |
| Switch | Network  switch  with  16  socket  places 10/100Mb/s and 2 x 1GB Uplink ports | 1piece | All 1GB/s ports +4 points | | |
| **Mobile work station – notebook** | | **1** | | | |
| **Dimensions** | | | | | |
| | Shape | Notebook | element of protection against physical | | |

| | | | damage within the casing and on the backside of the primary screen (made out of metal or alloy) + a system for protection of the disc against stresses (or solid state disc) + 2 points | | | |
|---|---|---|---|---|---|---|
| | Diagonal of the screen | 15-15.4" | | | | |
| | Weight (with battery without the charger) | max. 3.3kg | >2.70: +0.5 points | ≥2.50: +1point | <2.50: +2 points | |
| **Graphical subsystem** | | | | | | |
| | Declared mamximum resolution of the primary screen | 1280x800 (WXGA) | 1680x1050 (WSXGA+) or larger: +3points | | | |
| | Suport for external screen | yes | | | | |
| | Type of the graphical subsystem | PCIExpress | | | | |
| | Graphic processor | nVidia Quadro NVS 140M | | | | |
| | Video memory | 128MB separate memory | | | | |
| **CPU** | | | | | | |
| | Producer | Intel | | | | |
| | Number of cores | min. 2 | | | | |
| | Decalred working frequency | min. 2GHz | >2.2 GHz: +0.5 points | >2.5 GHz: +1points | | |
| | Size of the L2 Cache | min. 3MB | | | | |
| | Declared frequency FSB | min. 800MHz | | | | |
| **RAM** | | | | | | |
| | Type | DDR2 SDRAM 667MHz min. | | | | |
| | Capacity | 2GB in one slot, by type, type and producer original memory implemented by the producer of the computer | | | | |
| **Disc** | | | | | | |
| | Type | SATA | built in memory for caching the content of the disc min. capacity 1GB: +2 points | | | |
| | Capacity | min. 160GB | | | | |
| | Rotation speed | min. 5.400rpm | | | | |
| **Optical equipment** | | | | | | |
| | Type | DVD Recorder (Dual | | | | |

| | | Layer), min 16x | | | | |
|---|---|---|---|---|---|---|
| **Communication** | | | | | | |
| | LAN | integrated, 10/100/1000Mbps, RJ45 | | | | |
| | Modem | integrated 56Kbps, RJ11 | | | | |
| | wireless communication | integrated b/g/draft n 802.11 | support to 802.11a standard: +1points | | | |
| | Bluetooth | yes, integrated | | | | |
| | Firewire (IEEE 1394) | yes, integrated | | | | |
| | USB | min. 3 pieces, integrated | | | | |
| | rest of the ports | Line-In, Line-Out, integrated card reader of the SD type | | | | |
| **Batery** | | Li-Ion or Li-polimer, 6 cells min. | | | | |
| **Producer declared noise level** | | - | >42dB: 0 points | >38dB: +1 point | >35dB: +2 points | 35dB ili manje: +3 points |
| **Printer, scanner, copier** | | LAN interface, two side (duplex) printing, ADF | colour printer +3points | | | |

## Node for the simulation engine
No. of pieces that are purchased:        **4**

| | compulsory requirements | Additional offer | | |
|---|---|---|---|---|
| **Processor** | number of processors per node 4 | | | |
| | Type Intel Xeon QuadCore | | | |
| | working frequency 2.33GHz minimum | 2.4GHz<br><br>+3point s | More than 2.4GHz +6point s | |
| | capacity of L2-Cache 12MB minimum | | | |
| | niminal speed FSB 1333MHz min. | | | |
| **Memory** | DDRII 4 x 2GB, min 667MHz, by model and type of the original component of the computer poducer | 4x4GB<br><br>+5point s | | |
| | | More than 667 MHz +5point s | | |
| **Hard disc** | SATA 160GB 7200rpm, by model and type of the original component of the computer poducer | up to 250GB: +1 points | up to 500GB: +2 points | more than 500GB +4 points |
| **DVD reader/writer** | DVD, SATA, OEM, by model and type of the original component of the computer poducer | | | |
| **LAN** | 2x1000Mbps | | | |
| graphic card | integrated | | | |
| **Casing** | 1U, 19" for mounting in a rack | | | |

## Networking equipment, cabinet, rack, UPS and additional equipment for the simulation engine.

The number of pieced purchased are listed within the following table

|  | compulsory requirements | quant. | Additional offer | | |
|---|---|---|---|---|---|
| Cabine | Cabin for temperature control and audio isolation of the simulation engine witha system for cooling | 1 | | | |
| Rack | Type: Stand-alone (on the floor), dimensions 19", hight 42U | 1 | | | |
| | Cooling: 2 ventilators 100mm minimum | | | | |
| | Power strip: 8 sockets minimum | | | | |
| | Rest of the parts for completion | | | | |
| UPS | Aparatus for uninterupted power supply 3kW for mounting within a rack of 19" | 1 | 5kW +3points | | |
| Patch panel | 24 portn patch panel with sockets (full) category 6 | 1 | | | |
| UTP patch cable | UTP patch cable 3m long category 6 | 8 | | | |
| UTP patch cable | UTP patch cable 5m long category 6 | 16 | | | |
| Switch | 24 portn 1GB/s switch (all ports 1GB/s), svitching capacity minimum 24 Gbps | 1 | | | |
| KVM Switch | 8-portn KVM Switch | 1 | | | |
| Mouse | optical, min. One wheel, PS/2 or USB according to the specifications of the KVM switch | 1 | | | |
| Keyboard | PS/2 or USB according to the specifications of the KVM switch , standard set of basic keys | 1 | | | |
| Monitor | TFT 19"wide, max. resolution min. 1440x900,800:1,300cd, declared hor./ver. Angle of visibility 165°min/160°min. For built in a rack | 1 | 22" +1poit | | |

## *Storage* system of theNAS type with *host management* software

No. of pieces that are purchased:        1

| Category | description | Characteristics | additional offer | |
|---|---|---|---|---|
| RAID | | | | |
| | Controler | Dual active | | |
| | Levels | RAID 0,1,3,5,10 | | |
| Host interface | | | | |
| | Type | SATA II or iSCSI | SATA II 0 points | iSCSI +2points |
| | No. Of controllers | 2 | | |
| | No. Of hosts per controller | min 2 | | |
| Drive | | | | |
| | Interface | SAS | | |
| | Support | SAS and SATA | | |
| Storage | | | | |
| | Total no. Of places for discs | 4 min | 6 diska +2points | |
| | Type of discs | SATA II or SAS | SATA II 0 points | SAS +2 points |
| | No. of installed discs | 3 min. | | |
| | Capacity of the installed discs | 1.5 TB min. | | |
| Management software | | yes | | |
| Shape and dimensions of the casing | | rack mountable 19", max. 2U | | |
| waranty | | 3 years min | | |

## Requirements:

While choosing the offerer only complete offers will be taken into account i.e. only offers containing all the required equipment and material according to the specifications an the compulsory requirements. Additional offer is not compulsory but it may bring more points during the choice of the best offerer.

The offerer is due to prove the compliance of the technical requirements by providing excerpt from the original documentation or by providing the internet address of the producer of the equipment. One should give data related to the producer, type, model, and all other relevant data needed for unambiguous determination of the characteristics of the offered equipment. If the internet address of the producer is given one is to deliver a printed content of the web page where the information can be found.

Requirements whose fulfillment is not explained in the way described above will be considered unfulfilled. The orderer is not due to ask additional explanation of the application.

*Origin of the equipment*
The personal computer of type A and B belonging to Part 1 as well as the mobile work station must be produced by renowned producers of personal computers (DELL, HP, IBM, LENOVO, ACER, MSI, and SIEMENS).

The configuration of nodes for the simulation engine: part of the offer should be the schematic of connection of nodes being part of the position with storage system including the specification for the equipment needed and cables for connection. The nodes and the storage system need to be connected so that to perform as unique functional integrity. In addition, one needs to provide all needed cables and equipment according to the schematic of connectivity. The minimal configuration of connectivity that is to be enabled is use of one channel without redundancy.

Time limit for delivery: the offerer is due to provide for a delivery time limit not more than 30 days starting from the day of signing the contract.

Warranty period: The minimal warranty period that is to be provided by the offerer is 3 years.

Price: The price of the party isn't allowed to go over 23.300,00 EURO in RSD counter value.

## The way of marking (giving points)

A contract for delivery of the specified equipment will be offered to the offerer who by the procedure of marking gets the largest number of points. In the case that two or more offerers get the same number of points advantage will be given to the one that offers lower price.

The maximal number of points that an offerer may get is 100.
The points are given to the offerer based on the offered price, technical characteristics, and the authorized service in Nish:

$$P=P_{price}+P_{qvality}+P_{service}$$

The maximum number of point given based on the offered price is 30, while the number of point based on the offered price for every separate offer is calculated according to the following formula:

$$P_{price} = 30 \times \frac{\text{the min. price offered for the party}}{\text{the offered price}}$$

The maximal number of points based on technical characteristics and quality is 60 and the number of points for every separate offer is got by adding the appropriate points for every maximally fulfilled additional offer from the table in the column **Additional offer**.

Maximal number of points for authorized service on the territory of the town of Nish is 10 points. This number of points is given only if authorized service established before the publishing of this Public call , a proof being provided.

Offered configuration for a personal computer of the type A

| PROCESSOR | Number of cores |
|---|---|
| | working frequency Hz |
| | capacity L2-Cache |
| | nominal speed FSB. |
| MEMORY | |
| Hard disc | |
| Graphic card | |
| DVD reader/writer | |
| mouse | |
| Keyboard | |
| MONITOR | |

Offered configuration for a personal computer of the type B

| PROCESSOR | Number of cores |
|---|---|
| | working frequency Hz |
| | capacity L2-Cache |
| | nominal speed FSB. |
| housing | |
| MEMORY | |
| Hard disc | |
| Graphic card | |
| DVD reader/writer | |
| mouse | |
| Keyboard | |
| MONITOR | |

Offered configuration for the mobile working station - notebook

| PROCESSOR | Number of cores |
|---|---|
| | working frequency Hz |
| | capacity L2-Cache |
| | nominal speed FSB. |
| MEMORY | |
| Hard disc | |
| Graphic card | |
| DVD reader/writer | |
| Optical equipment | |
| Communication | |
| Noise level | |
| Dimensions | |
| Battery | |

Offered configuration for the printer/scanner/copier

| Printer/scanner/copier | |
|---|---|

Offered configuration for a node of the simulation engine

| Processor | Number of processors per node | |
|---|---|---|
| | Type | |
| | working frequency | |
| | capacity L2-Cache | |
| | nominal speed | |
| Memory | | |
| Hard disc | | |
| DVD reader/writer | | |
| LAN | | |
| Graphic card | | |
| Housing | | |

Offered configuration for the *storage* system of the NAS type with *host management* software

| RAID | | |
|---|---|---|
| | Controller | |
| | Levels | |
| Host interface | | |
| | Type | |
| | Number of controllers | |
| | Number of hosts per controller | |
| Drive | | |
| | Interface | |
| | Support | |
| Storage | | |
| | Total number of places on the discs | |
| | Type of discs | |
| | Number of discs installed | |
| | Capacity of the disc installed | |
| Management software | | |
| Shape and dimensions of the housing | | |

Name of the offerer                                Authorized person of the offerer

                                    P.S.

**OFFER**
**ACCORDING TO THE PUBLIC PURCASE OF GOODS**
**- PART I -**

Number of the offer:
Date:

According to the call that you published in Official Journal of Republic of Serbia No. 107/2008, on 21. November 2008. we deliver an offer for the following equipment:

| No. | Name | Unity price (only for computers) without VAT |
|---|---|---|
| 1 | Personal computer of the type A | |
| 2 | Personal computer of the type B | |
| 3 | Mobile working station–notebook | |
| 4 | Printer/copier/scanner | |
| 5 | Networking equipment | |

| No. | Name | Total price in RSD without VAT |
|---|---|---|
| 6 | Node for the simulation engine | |
| 7 | Networking equipment, cabinet, rack, UPS and additional equipment for the simulation engine | |
| 8 | *Storage* system | |
| Total (1, 2, 3, 4, 5, 6, 7, 8): | | |

Commercial and technical conditions of the offer:

- Time limit of payment: 60% after delivery, 40% after establishment of compatibility of equipment named in Part 2.
- Validity of the offer: 60 days starting of the day of application
- Delivery time limit: 30 after signing the contract
- Warranties: 3 years
- Maximal price 23300 EURO in RSD counter value
- Place of delivery: Faculty of electronic engineering Nish

Authorized person
P.S.

Offerer:

## Statement of fulfillment of the conditions of the Call

| I do confirm that the following requirements are fulfilled | Yes | No |
|---|---|---|
| Compulsory technical requirements of the offered equipment | | |
| Compulsory requirements related to the origin of the equipment, warranty period and time limit of delivery | | |
| Offered all parts of the equipment that are required | | |
| I here declare that all time limits and conditions required by the Call and the appropriate documentation will be respected. | Signed and sealed | |
| Director (name): | | |

PART I

# CONTRACT
## Of public purchase of goods

Signed on _____.2008. in Nish between:

1. FACULTY OF ELECTRONIC ENGINEERING IN NISH, Aleksandra Medvedeva str. No. 14, represented by the dean, prof. Dr. Dragan Antich (in the rest of this document the orderer), on one side and

2. _____(name and address of the Offerer), represented by Director _____ (in the rest of this document : The Offerer), on the other side.

## 1. SUBJECT OF THE CONTRACT

Paragraph 1.

In the procedure of public purchase of goods that is conducted according to the Low of public purchase, after the public Call published in the Official Journal Of Republic Of Serbia No. 107/2008, of 21. November 2008. as the most convenient offerer _____was chosen, so that to that offerer so that that offerer is allotted a contract of public purchase of goods..

Subject of the Contract is purchase of equipment for the needs of the realization of the project TEMPUS JEP 41107 (Part I) at the Faculty of Electronic Engineering in Nish, in all in accordance to the offer No. _____ of _____.2008.

The offerer is guarantying that the equipment that is subject of this contract possesses technical characteristics and fulfills technical requirements and and standards foreseen in the tender documentation for Part I.

Paragraph 2.

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The Orderer and the Offerer are agreed that the price of the equipment from paragraph 1 of this Contract is _____ RSD, without VAT, as being given in the offer.

The Orderer confirms that the agreed price will be paid in the following way: 60% after delivery, 40% after establishment of compatibility with equipment named in part 2.

Paragraph 3.

The offerer is due to deliver the equipment named in this Contract within 30 days.

Warranty for the delivered equipment is 3 years.

Paragraph 4.

To all issues that are not regulated by this Contract The Low of debenture will be applied as well as the low of Public purchase.

Paragraph 5.

The contracting parties are in accordance to resolve all relations coming out of this Contract in consent with each other, while for possible litigation they accept the authority of the Commercial Court in Nish

Paragraph 6.

This Contract is prepared in four copies, two (2) of which are given to each party.

For the Offerer                         For the Faculty of Electronic Engineering in Nish

_____        _____,
director                               prof. Dr. Dragon Antioch, dean

# DECLARATION

According to the paragraph 27. part 3. line 5) of the Low of public purchase (Official Journal of Republic of Serbia No. 39/02, 43/03 , 55/04 и 101/05) we here declare that we accept the conditions from the Public Call of the Faculty of Electronic Engineering in Nish published in theизјављујемо да прихватамо услове из јавног позива Електронског факултета у Нишу објављеног у « Official Journal of Republic of Serbia No. 107/2008, of 21. November 2008. for collecting of offers in an open procedure for public purchase of goods – computer, networking and video equipment for the needs of realization of the project TEMPUS JEP 41107 (PART I).

Date,_____            Offerer

# PART II

Measurement-acquisition equipment for the realization of the project TEMPUS- JEP 41107

Subject of the purchase are the specified goods and appropriate warranty.
The offerer is due to offer the equipment without VAT, while the faculty of Electronic Engineering is due to issue an confirmation related to Vat exclusion.

REQUIREMENT:
- Time limit and way of payment according to the offer
- Warranty of 3 years
- Maximal total price of 30.000,00 EURO in RSD counter value

## SPECIFICATION OF THE GOODS

| Compulsory requirements | | quant. | Additional offer | |
|---|---|---|---|---|
| **Acquisition module** | | **8** | | |
| Acquisition module | Acquisition module 16-Bit, min 1.25 MS/s sampling speed, USB interface, 16 analog inputs, 2 analog outputs, terminal for connection with the measuring points, supportfor LABVIEW (similar to NI-USB 6251), | | 24 and more analog inputs +6 points | |
| | | | 4 and more analog inputs +6 points | |
| | | | resolution 18bit and more +7 points | |
| | | | More than 1.25MS +7 points | |

| Compulsory requirements | | | quant. | Additional offer | |
|---|---|---|---|---|---|
| **Measurmen-ackvisition working place** | | | | | |
| Computer cotroller for the modules | Core Duo 2.0GHz | Similar to NI PXI-8105 | 1 | | |

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| | | | | RAM 2GB +2points | RAM 4GB +4 points |
|---|---|---|---|---|---|
| | 1GB RAM | | | | |
| | GPIB, serial and DVI port | | | | |
| | 1GB/s LAN | | | | |
| | ExpressCard ¾ slot | | | | |
| | Windows XP system | | | | |
| | Hard disk | | | HDD do 250GB: +2 points | HDD 250GB i više: +4 points |
| Modul za akviziciju analognih i digitalnih signala | 18-bitni modul sabrzinom semplovanja od max 625 kS/s, 16 analogna ulaza, 24 digitalnih I/O, 2 analogna izlaza (Similar to NI PXI-6281) | | 1 | 24 i više analog. ulaza +6 points | |
| | | | | 4 i više analog. Izlaza +6 points | |
| | | | | Rezolucija 24bit i više +7 points | |
| | | | | više od 625kS/s +7 points | |
| Block connector for module under No. 2 | I/O connector with 4 slots for (Similar to SCC-68) | | 1 | | |
| 2m cable for connection of modules (2 i 3) | Shieldedcable of lenght 2m (similar to SHC68-68-EPM) | | 1 | | |
| Osciloscope module, 20Ms/s | 15MHz two-channel osciloscope for sampling speed of 20Ms/s (Similar to NI PXI-5102) | | 1 | | |
| Coaxial cable for the module 5 | Coaxial cable 50Ω for connectionof modules (Similar to SMB-100) | | 1 | | |
| Module for aqcvisition of digital signals | Reconfigurable FPGA programmable module for acquisition of digital signals with 160 inpu/output and anlalysis of protocols with 3 millions of cells of speed up to 40MHz (Similar to NI PXI-7813R) | | 1 | | |
| Block connector for the module under No. 8 | I/O connector (Similar to SCB-68) | | 4 | | |
| Cable 1m shielded | Cable for connectionitem no. 7 and No. 8 (Similar to type SHC68-68-RDIO) | | 4 | | |
| Module with digital signal generator | Module with digital signal generator up to 20MHz, 5V TTL/CMOS (Similar to NI PXI-6534) | | 1 | | |
| Block connector for the module No. 9 | Connector (Similar to SCB-68) | | 1 | | |
| 2m Cable for connecting modules (No. 9 and No.10) | Shielded cableof lenght 2m (Similar to SH68-68-D1) | | 1 | | |

| | | |
|---|---|---|
| Module with counter/timer | counter/timer with eight 32-bit counter/timer with the abilityof countingin both directions and 32 digital inpout/output lines of 5V level (Similar to NI PXI-6602) | 1 |
| Connector for counter/timer | Connector for counter/timer (Similar to TB-2715) | 1 |
| Module for generation of sinusoidal signal | Generator of sinusoidal signalof frequency range from 9kHz up to 100MHz (Similar to NI PXI-5404) | 1 |
| Coaxial cable for module 14 | Coaxial cable 50Ω for connectioon of modules (Similar to SMB-110) | 3 |
| Probes for digital multimeter | Probes for digital multimeter | 1 |
| Housing for the modules with power supply | Housing with the capacity of accepting 14 modules with power supply (Similar to NI PXI-1044), kabl | 1 |
| **The modules must have a software support for LabVIEW or MATLAB** | | |

## Way of marking

A contract for delivery of the specified equipment will be offered to the offerer who by the procedure of marking gets the largest number of points. In the case that two or more offerers get the same number of points advantage will be given to the one that offers lower price.

The maximal number of points that an offerer may get is 100.
The points are given to the offerer based on the offered price, technical characteristics:

$$P = P_{price} + P_{quality}$$

The maximum number of point given based on the offered price is 40, while the number of point based on the offered price for every separate offer is calculated according to the following formula:

$$P_{price} = 40 \times \frac{\text{the min. price offered for the party}}{\text{the offered price}}$$

The maximal number of points based on technical characteristics and quality is 60 and the number of points for every separate offer is got by adding the appropriate points for every maximally fulfilled additional offer from the table in the column **Additional offer**.

**OFFER**
**ACCORDING TO THE PUBLIC PURCASE OF GOODS**
**- PART I I-**

Number of the offer:
Date:

According to the call that you published in Official Journal of Republic of Serbia No. 107/2008, on
21. November 2008. we deliver an offer for the following equipment:

| No. | Name | Total price |
|---|---|---|
| 1. | According to the specification of the equipment | |

Commercial and technical conditions of the offer:

- Time limit and way of payment: in advance (after signing the contract ) 50 %, the rest of 50 % after delivery and performed technical acceptance by the commission of the Faculty of Electronic Engineering
- Validity of the offer _____
- Time limit of delivery _____
- Warranty _____
- Place of delivery: Faculty of Electronic Engineering Nish

Authorized person

P.S.

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Offerer:

## Statement of fulfillment of the conditions of the Call

| I do confirm that the following requirements are fulfilled | Yes | No |
|---|---|---|
| Compulsory technical requirements of the offered equipment | | |
| Compulsory requirements related to the origin of the equipment, warranty period and time limit of delivery | | |
| Offered all parts of the equipment that are required | | |
| I here declare that all time limits and conditions required by the Call and the appropriate documentation will be respected. | Signed and sealed | |
| Director (name): | | |

PART II

# CONTRACT
# Of public purchase of goods

Signed on _____.2008. in Nish between:

3. FACULTY OF ELECTRONIC ENGINEERING IN NISH, Aleksandra Medvedeva str. No. 14, represented by the dean, prof. Dr. Dragan Antich (in the rest of this document the orderer), on one side and

4. _____(name and address of the Offerer), represented by Director _____ (in the rest of this document : The Offerer), on the other side.

## 1. SUBJECT OF THE CONTRACT

### Paragraph 1.

In the procedure of public purchase of goods that is conducted according to the Low of public purchase, after the public Call published in the Official Journal Of Republic Of Serbia No. 107/2008, of 21. November 2008. as the most convenient offerer _____was chosen, so that to that offerer so that that offerer is allotted a contract of public purchase of goods..

Subject of the Contract is purchase of equipment for the needs of the realization of the project TEMPUS JEP 41107 (Part II) at the Faculty of Electronic Engineering in Nish, in all in accordance to the offer No. _____ of _____.2008.

The offerer is guarantying that the equipment that is subject of this contract possesses technical characteristics and fulfills technical requirements and and standards foreseen in the tender documentation for Part II.

Paragraph 2.

The Orderer and the Offerer are agreed that the price of the equipment from paragraph 1 of this Contract is _____ RSD, without VAT, as being given in the offer.

The orderer is declaring that to contracted price will be paid in the following way: in advance after signing the contract 50% , and 50% after delivery and performed reception of the equipment by The Commission of the Faculty of Electronic Engineering.

The offerer is due to provide a bank warranty before the advanced payment is done (amount of advanced payment).

Paragraph 3.

The offerer is due to deliver the equipment named in this Contract within 30 days.

Warranty for the delivered equipment is 3 years.

Paragraph 4.

To all issues that are not regulated by this Contract The Low of debenture will be applied as well as the low of Public purchase.

Paragraph 5.

The contracting parties are in accordance to resolve all relations coming out of this Contract in consent with each other, while for possible litigation they accept the authority of the Commercial Court in Nish

Paragraph 6.

This Contract is prepared in four copies, two (2) of which are given to each party.

For the Offerer                      For the Faculty of Electronic Engineering in Nish

_____     _____,

director                            prof. Dr. Dragon Antioch, dean

# DECLARATION

According to the paragraph 27. part 3. line 5) of the Low of public purchase (Official Journal of Republic of Serbia No. 39/02, 43/03 , 55/04 и 101/05) we here declare that we accept the conditions from the Public Call of the Faculty of Electronic Engineering in Nish published in theизјављујемо да прихватамо услове из јавног позива Електронског факултета у Нишу објављеног у « Official Journal of Republic of Serbia No. 107/2008, of 21. November 2008. for collecting of offers in an open procedure for public purchase of goods – computer, networking and video equipment for the needs of realization of the project TEMPUS JEP 41107 (PART II).

Date,_____                    Offerer

# PART III

Rest of the equipment: video, measurement, development surroundings, material for the student working boards and components for testing integrated circuits for the need of realization of the project TEMPUS/ JEP 41107

Subject of the public purchase are specified goods and appropriate warranty.
The offerer is due to offer the equipment without VAT, while The Faculty of Electronic Engineering will issue a confirmation of VAT exclusion.

REQUIREMENTS:
-   Time limit and way of payment 100% after delivery. The Commission of the Faculty of Electronic Engineering will perform verification of the delivered equipment, realizability of connect the equipment and performs a test switch on, based on which makes a protocol of acceptance and gives recommendation for the finish of the procedure of purchase and payment of the second part of the contracted value.
-   Delivery time limit 30 days
-   Warranties 3 years
-   Maximal total price for this party is 1.530,00 EURO in RSD counter value.

## SPECIFICATION OF THE GOODS

Number of pieces that are purchased: **1**

| Compulsory requirements | |
| --- | --- |
| FPGA development surroundings | development surroundings (Spartan-3E Starter Kit or fo similar characteristics) |

## Material for the students working boards
The quantities are given in the Table

| Resistors (carbon alloy 1/4W) | |
| --- | --- |
| value | quantity |
| 12 Ω | 55 |
| 33 Ω | 30 |
| 47 Ω | 35 |
| 68 Ω | 10 |
| 100 Ω | 160 |
| 130 Ω | 10 |
| 150 Ω | 20 |

| 180 Ω | 60 |
|---|---|
| 240 Ω | 50 |
| 470 Ω | 100 |
| 680 Ω | 35 |
| 1k Ω | 290 |
| 1.2 kΩ | 30 |
| 1.3 kΩ | 35 |
| 1.5 kΩ | 40 |
| 2.4 kΩ | 20 |
| 3.3 kΩ | 10 |
| 4.3 kΩ | 10 |
| 4.7 kΩ | 55 |
| 5.1 kΩ | 10 |
| 10 kΩ | 330 |
| 15 kΩ | 30 |
| 22 kΩ | 10 |
| 24 kΩ | 10 |
| 30 kΩ | 10 |
| 33 kΩ | 30 |
| 47 kΩ | 110 |
| 100 kΩ | 80 |
| 150 kΩ | 30 |
| 220 kΩ | 220 |
| 300 kΩ | 10 |
| **POTENTIOMETERS (linear, rotational)** | |
| value | quantity |
| 10 kΩ | 20 |
| 47 kΩ | 10 |
| 50 kΩ | 10 |
| **CAPACITORS** | |
| Value | Quantity |
| 100 pF (ceramic) | 20 |
| 470 pF (ceramic) | 20 |
| 0.15 nF (ceramic) | 70 |
| 0.33 nF (ceramic) | 20 |
| 1 nF (ceramic) | 20 |
| 2 nF (ceramic) | 20 |
| 3 nF (ceramic) | 40 |
| 3.3 nF (ceramic i) | 75 |
| 15 nF (ceramic) | 40 |
| 33 nF (ceramic) | 40 |
| 100 nF (ceramic) | 20 |
| 100 uF (electrolytic, 16V) | 10 |
| **SWITCHES** | |
| type | quantity |
| click-clack (1 pole, 2 positions on/off) | 200 |
| click-clack (1 pole, 3 positions on/off/on) | 200 |
| DIP4 | 55 |

32

| DIP8 | 10 |
|---|---|
| tasters | 30 |
| **IC Circuits (for the logic circuit one may offer a substitution from the HC series)** | |
| Type | quantity |
| UCY7407 | 10 |
| SN7400N | 10 |
| IDT7408 | 20 |
| UA741CN | 10 |
| UCY7493 | 10 |
| SN7405 | 10 |
| MC14071B | 10 |
| CD4049UBE (6xnot) | 10 |
| MC14011B (4xnand) | 10 |
| CD74HCT221 (dual msmv) | 10 |
| NL17SY74 (single dff) | 10 |
| LM148JAN (Quad) | 10 |
| LM710 (comparator) | 70 |
| MC14073BCP | 10 |
| TC4073BP | 10 |
| MC14072B | 10 |
| CD4049UBE | 10 |
| HD14081BP | 10 |
| CD4075BCN | 10 |
| HEF4013BP | 10 |
| CD4049UBE | 10 |
| MA741 (DIP 14-pinko) | 50 |
| UA741(DIP 8-pinsko) | 10 |
| **Sockets for IC circuits** | |
| type | quantity |
| Socket (8 – pin) | 10 |
| Socket (16 – pin) | 10 |
| Socket (14 – pin) | 190 |
| **TRANSISTORS** | |
| type | quantity |
| BC107 | 20 |
| BC109C | 10 |
| **ZENER DIODES** | |
| type | quantity |
| BXZ 6.8 | 10 |
| BXZ 8.8 | 10 |
| **LED DIODES (5mm, 10mA)** | |
| type | quantity |
| Led Diode (red) | 200 |
| Led Diode (green) | 20 |
| **FUSES** | |
| type | quantity |
| F2/250E | 10 |
| **MATERIAL** | |
| Type | quantity |

| | |
|---|---|
| Plexiglas (30x20cm) | 35 |
| Wooden panel (30x20cm) | 35 |
| furnir (30x4x1cm) | 70 |
| Buksna (white) | 200 |
| Buksna (red) | 250 |
| Buksna (blue) | 120 |
| Buksna (green) | 30 |
| Buksna (white) | 30 |
| Buksna (black) | 60 |
| Buksna (grey) | 60 |
| Screw (wooden, 2.5cm) | 250 |
| Flat cable multicolor, ten wire, 1mm | 60m |
| Tin wire | coil |
| Paste | tuba |
| Metal frame for the PCB | 130 |
| **THE REST OF COMPONENTS** | |
| type | quantity |
| Finder 95.83.3 | 2 |
| Finder 40.31.230 | 2 |
| Finder 95.85.5 | 2 |
| Finder 40.52.230 | 2 |

Note: for some of the components the English name was not known to Prof. Litovski who is translating this document in an imposed rush.

## Component for testing of integrated circuits
Number of pieces given in the table

| material | quantity |
|---|---|
| socket ic test dil 40 | 2 pieces |
| | |
| Socket ic chip plcc 20 | 1 piece |
| Socket ic chip plcc 28 | 1 piece |
| Socket ic chip plcc 32 | 1 piece |
| Socket ic chip plcc 44 | 1 piece |
| Socket ic chip plcc 52 | 1 piece |
| | |
| Socket ic to-100 | 1 piece |
| | |
| Socket ic smd plcc 20 | 1 piece |
| Socket ic smd plcc 28 | 1 piece |
| Socket ic smd plcc 32 | 1 piece |
| Socket ic smd plcc 44 | 1 piece |
| Socket ic smd plcc 52 | 1 piece |
| | |
| hilzna 1mm | 300 pieces |
| termo bužir | 1m |
| Bananice | 150 pieces |
| crne buksne | 100 pieces |

| crvene buksne | 100 pieces |
| jednožilna žica 2mm | 50m |
| | |
| furnirana iverica 1cm | 1m$^2$ |
| Plexiglass 5mm | 1m$^2$ |
| | |
| kontakt sprey | 1 piece |

Note: for some of the components the English name was not known to Prof. Litovski who is translating this document in an imposed rush.

## Video projector and a screen
Number of pieces being purchased: **1**

| Description | Compulsory requirements |
|---|---|
| Video projector | 2000ANSI, 1024x760, 2000:1 contrast, VGA input, life longevity of the walve 3000 hours |
| Screen | 180x180cm |

## Requirements:
When chhosing the best offerer one will consider only complete offers i.e. only those offers that contain the required equipment and material according to the specification and satisfy the compulsory requirements

## Way of marking

The maximal number of points based on the offered price is 100 points, while the number of points based on the offered price will be calculated according to the following formula:

$$P = 100 \times \frac{\text{the min. price offered for the party}}{\text{the offered price}}$$

**OFFER**
**ACCORDING TO THE PUBLIC PURCASE OF GOODS**
**- PART I II-**

Number of the offer:
Date:

According to the call that you published in Official Journal of Republic of Serbia No. 107/2008, on
21. November 2008. we deliver an offer for the following:

| No. | Name | Total price |
|---|---|---|
| 1. | According to the specification of the equipment | |

Commercial and technical conditions of the offer:

-   Time limit and way of payment: after delivery and performed technical acceptance by the commission of the Faculty of Electronic Engineering
-   Validity of the offer 60 days
-   Time limit of delivery 30 days
-   Warranty 3 years
-   Place of delivery: Faculty of Electronic Engineering Nish

Authorized person

P.S.

Offerer:

## Statement of fulfillment of the conditions of the Call

| I do confirm that the following requirements are fulfilled | Yes | No |
|---|---|---|
| Compulsory technical requirements of the offered equipment | | |
| Compulsory requirements related to the origin of the equipment, warranty period and time limit of delivery | | |
| Offered all parts of the equipment that are required | | |
| I here declare that all time limits and conditions required by the Call and the appropriate documentation will be respected. | Signed and sealed | |
| Director (name): | | |

**PART III**

# CONTRACT
# Of public purchase of goods

Signed on _____.2008. in Nish between:

5. FACULTY OF ELECTRONIC ENGINEERING IN NISH, Aleksandra
   Medvedeva str. No. 14, represented by the dean, prof. Dr. Dragan Antich (in
   the rest of this document the orderer), on one side and

6. _____(name and address of the Offerer),
   represented by Director _____ (in the rest of this
   document : The Offerer), on the other side.

## 1. SUBJECT OF THE CONTRACT

Paragraph 1.

In the procedure of public purchase of goods that is conducted according to the
Low of public purchase, after the public Call published in the Official Journal Of
Republic Of Serbia No. 107/2008, of 21. November 2008. as the most convenient
offerer _____was chosen, so that to that offerer so that
that offerer is allotted a contract of public purchase of goods..

Subject of the Contract is purchase of equipment for the needs of the realization of
the project TEMPUS JEP 41107 (Part III) at the Faculty of Electronic Engineering in
Nish, in all in accordance to the offer No. _____ of
_____.2008.

The offerer is guarantying that the equipment that is subject of this contract
possesses technical characteristics and fulfills technical requirements and and
standards foreseen in the tender documentation for Part III.

Члан 2.

The offerer nad the Orderer are agreed that the price of the equipment from paragraph 1 of this Contract is _____ RSD, without VAT, as given in the offer.

The orderer is taking the responsibility to pay the contracted price in the following way: after delivery and the performed acceptance by the Commission of the faculty of Electronic Engineering in Nish.

### Paragraph 3.

The offerer is due to deliver the equipment named in this Contract within 30 days.

Warranty for the delivered equipment is 3 years.

### Paragraph 4.

To all issues that are not regulated by this Contract The Low of debenture will be applied as well as the low of Public purchase.

### Paragraph 5.

The contracting parties are in accordance to resolve all relations coming out of this Contract in consent with each other, while for possible litigation they accept the authority of the Commercial Court in Nish

### Paragraph 6.

This Contract is prepared in four copies, two (2) of which are given to each party.

For the Offerer                     For the Faculty of Electronic Engineering in Nish

_____        _____,

director                            prof. Dr. Dragon Antioch, dean

# DECLARATION

According to the paragraph 27. part 3. line 5) of the Low of public purchase (Official Journal of Republic of Serbia No. 39/02, 43/03 , 55/04 и 101/05) we here declare that we accept the conditions from the Public Call of the Faculty of Electronic Engineering in Nish published in theизјављујемо да прихватамо услове из јавног позива Електронског факултета у Нишу објављеног у « Official Journal of Republic of Serbia No. 107/2008, of 21. November 2008. for collecting of offers in an open procedure for public purchase of goods – computer, networking and video equipment for the needs of realization of the project TEMPUS JEP 41107 (PART III).

Date,_____  Offerer

40

| Skopje: Laboratory Equipment | | | | | | |
|---|---|---|---|---|---|---|
| Lab restructuring | | | | | Budget: | 16120 |
| TYPE | Quantity | Purpose | Users | Access | Price per piece (in euros) | Total price (in euros) |
| Workstations | 5 | Design of SoC | Students | All students | 700 | 3500 |

| | | | | | | |
|---|---|---|---|---|---|---|
| FPGA devices | 24 | Design of SoC | Students | All students | 30 | 720 |
| Network Equipment | 1 | Connecting the lab. Equipment | Students | All students | 400 | 400 |
| FPGA Development Boards | 5 | Development of SoC | Students | All students | 400 | 2000 |
| Design Software | 2 | Design of SoC | Students | All students | 2000 | 4000 |
| IP cores | 1 | Design of SoC | Students | All students | 2700 | 2700 |
| Measurement and test Equipment | 1 | Design of SoC | Students | All students | 1000 | 1000 |
| Video Beam | 1 | Presentations | Students | All students | 800 | 800 |
| Laptop | 1 | Presentations | Professors | All students | 1000 | 1000 |

| | |
|---|---|
| **TOTAL PRICE** | **16120** |

| Curriculum development | | | | | Budget: | 1500 |
|---|---|---|---|---|---|---|
| **TYPE** | **Quantity** | **Purpose** | **Users** | **Access** | **Price per piece (in euros)** | **Total price (in euros)** |
| Laptop | 2 | Using for developing the cuddiculum | Professors | Professors | 750 | 1500 |
| **TOTAL PRICE** | | | | | | **1500** |

| Library, inter-partner shering | | | | | Budget: | 1659 |
|---|---|---|---|---|---|---|
| **TYPE** | **Quantity** | **Purpose** | **Users** | **Access** | **Price per piece (in euros)** | **Total price (in euros)** |
| Server | 1 | Data, File and Web server | Students | All faculty members and students | 1659 | 1659 |
| **TOTAL PRICE** | | | | | | **1659** |

| Management of the project | | | | | Budget: | 600 |
|---|---|---|---|---|---|---|
| **TYPE** | **Quantity** | **Purpose** | **Users** | **Access** | **Price per piece (in euros)** | **Total price (in euros)** |
| Printer | 1 | Used for all activities | Professors and students | Professors and SoC Students | 600 | 600 |
| **TOTAL PRICE** | | | | | | **600** |

**Dissemination**

Please describe what actions have been or are planned to be undertaken for the dissemination of the results of the different activities, both within the project framework and outside the project itself. In particular you should refer to definition of tasks and concrete dissemination channels to make the project results available to larger beneficiary groups. If a web site for the project has been created, please provide the address. If there have been any unexpected positive secondary effects of the project activities, please describe them under this section.

| |
|---|
| Web sites are created at both PC universities: Niš University: http://venus.elfak.ni.ac.yu/ and |

SkopjeUniversity:
http://e-tech.etf.ukim.edu.mk/e-tech/Projects/SystemonChipTEMPUS/tabid/104/language/en-US/Default.aspx

Niš University presented "System on Chip Design – new curriculum at Faculty of Electronics, Nis" at
- 3rd ICT Forum, Nis, Serbia, November 4-6, 2008 organized by the Regional Chamber of Commerce
- INDEL 2008 Conference, Banjaluka, , November 6-8, 2008

Both PC partners prepare papers for the Joint Workshop with two other Tempus projects during the TREND 2009 Conference at Kopaonik, Serbia (March 2nd-5th, 2009).

Final dissemination event will take place as a joint event to ETRAN Conference in the first week of June 2009. This conference is the biggest event in the field where all the major players in the region participate. The consortium will prepare flyers and other accompanying material that is necessary for successful dissemination.

## Sustainability

A project is sustainable when it continues to deliver benefits to the project beneficiaries and/or other target groups for an extended period after the EU's financial assistance has been terminated. Sustainability may not concern all the aspects of a project; in each project some activities or results may be maintained, while others may not be so necessary to maintain. Please explain which of your planned activities and results must be maintained to make your project sustainable. Describe which measures you foresee to realistically ensure the continuity of those activities and results beyond the lifetime of the project (even under conditions of financial autonomy). The sustainability plan should refer to such issues as: academic/socio-economic/national support (describe the measures undertaken to formalise or institutionalise any links with local non-university partners), involvement of consortium members (ownership/motivation), effective management and leadership, active participation of the target group, forecast of needs, availability of resources for continuation, capitalisation of achieved results and measurable medium/long term impact (long-lasting effect of the project cooperation as well as impact on partner institutions and target groups).

Sustainability of the project is guaranteed through the accreditation that SoC Master Courses at both PC universities received from their respective Ministries.

Also the long experience of the corresponding laboratories and their key staff members whose various relations to governmental, academic and industrial parties will capitalize the impact of the project to long lasting effect.

The Universities of Niš and Skopje are taking steps to get the recognition from the regional Chambers of Commerce regarding the relevance of new Master Courses to the labour market.

## Quality control and monitoring

Please describe what monitoring activities the consortium carries out in order to assess whether the project proceeds according to the workplan. Please describe the strategy for internal and external evaluation of the project results and include measurable quality indicators for progress. In addition to the project results (courses, publications, new institutional structures, etc), you should pay attention also to the strategy for project management. In particular, explain what instruments you use to ensure effectiveness of the quality control (i.e. Logframe approach, feedback questionnaires for evaluation or survey, swot analysis, etc.) and the bodies involved in evaluation (i.e. committee(s), validation commission(s), accreditation board(s), etc.). For external evaluation, you may indicate the role of independent experts or peer reviewers providing a summary of their evaluation plan and report(s).

The project is subjected to the quality control and monitoring through internal and external evaluation. The internal control is carried out by the active participation of all main staff members listed at the end of the report. Also the university authorities will participate in this activity as suggested by the EC.

Regarding the external evaluation e.g. practically all documents (presentations, correspondence) that were produced at Niš University are delivered to the TEMPUS Serbia office in Belgrade.

External evaluation was carried out on new curricula proposed by the University of Niš. At the project Web site one can find the evaluations of the industrial experts from
Fujitsu,
Lime Microsystems and
ST Microelectronics.

## Any other comment

Please provide in this entry any relevant information you think to be useful for the assessment of your project implementation (i.e. synergies with other projects, any support from outer environment, networking with professional bodies, etc.).

We are planning a joint workshop during TREND 2009 conference at Kopaonik, Serbia March 2-5, 2009 with two other Tempus projects:
      JEP 41085 Joint Advanced Doctoral Degree in Energy Systems and
      JEP 41099 Doctoral School towards European Knowledge Society.

Also the possibility to network the projects has just started to be considered through initial communication with
      JEP - 41119 - 2006 Development of Teaching Education at the University of Novi Pazar.

# Statistics and Indicators

**This section aims to gather statistical data and indicators of performance. Please provide information strictly focusing on the present state of play of your project.**

## Staff training

**Number of teaching staff trained or retrained**                          `1`
Please indicate the number of teaching staff (professors, assistants with teaching tasks, etc.) trained and/or retrained <u>to the date of the report submission</u>.

**Number of trainers trained**                                             `0`
Please indicate the number of trainers (persons performing teaching activities either targeted to other trainers or not performing it as staff of a University) trained <u>to the date of the report submission</u>.

**Number of trainees trained**                                             `0`
Please indicate the number of trainees (persons attending training and/or retraining courses that cannot be considered as University students. I.e. staff of a local public administration office, members of an association and/or local NGOs, etc.) trained <u>to the date of the report submission</u>.

**Number of administrative staff trained or retrained**                    `0`
Please indicate the number of University administrative staff (librarians, international office's staff, IT specialists, etc.) trained and/or retrained <u>to the date of the report submission</u>.

## Mobility

**Number of partner country - EU/Acceding/Candidate mobility flows**        `0`
Please indicate the number of <u>staff</u> mobility flows performed from the partner country/ies to the European Union and or Acceding/Candidate countries <u>to the date of the report submission</u>.

**Number of EU/Acceding/Candidate - partner country mobility flows**       `0`
Please indicate the number of <u>staff</u> mobility flows performed from the European Union and or Acceding/Candidate countries to the partner country/ies <u>to the date of the report submission</u>.

**Number of partner country internal mobility flows**                      `0`
Please indicate the number of <u>staff</u> mobility flows performed within the same consortium partner country <u>to the date of the report submission</u>. In case more than one partner country participates in your project, please provide the total number of internal mobility flows resulting from the addition of flows performed in each partner country. (Ex: 2 internal flows in Albania and 3 internal flows in Croatia = 5).

**Number of EU internal mobility flows**                                   `0`
Please indicate the number of <u>staff</u> mobility flows performed within the same EU and/or acceding/candidate country <u>to the date of the report submission</u>. Please provide the total number of internal mobility flows resulting from the addition of flows performed in each partner country. (Ex: 2 internal flows in Sweden and 1 internal flow in Slovakia = 3).

**Number of administrative mobility flows**                                `0`
Please indicate the number of mobility flows performed for strictly administrative reasons (co-ordination meetings, etc.) <u>to the date of the report submission</u>. In case this activity is linked to other project content activities, please include this mobility within the above-mentioned categories.

**Other**

**Number of publications**                                                               | 0 |

Please indicate the number of publications (books, compendia, articles, papers, etc.) produced <u>to the date of the report submission</u>.

**Number of developed curricula**                                                        | 9 |

Please indicate the number of curricula produced <u>to the date of the report submission</u>.

**Number of new institutions**                                                           | 0 |

Please indicate the number of new institutions created in the framework of your project (new university library, new international relation office, new association of experts and/or professors, new university career centre, etc.) <u>to the date of the report submission</u>.

**Number of restructured institutions**                                                  | 0 |

Please indicate the number of institutions restructured in the framework of your project (upgrade of university libraries, re-organisation of the international relation office, revision of the mandate of research centres, etc.) <u>to the date of the report submission</u>.

|                                                      | YES | NO | N/A |
|------------------------------------------------------|-----|----|-----|
| **Difficulties in financial management**             |     | X  |     |

Please indicate whether you experienced any sort of difficulty while managing your project from the financial point of view.
**Comments if any:** The money transfer to the partners was delayed more than 8 months due to the budget changes. The latency in communication with local authorities at both PC centres for the purchase of the equipment is overcome .

| **Bologna Process**                                  | X   |    |     |

Please indicate whether your project contributes to the achievement of the Bologna Process' objectives in the consortium partner country(ies). For information on the Bologna Process:
http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html
**Comments if any:**

| **Adoption of a system of easily readable and comparable degrees** | X | | |

Please indicate whether your project contributes to the achievement of readable and comparable degrees.
**Comments if any:**

| **Diploma supplement**                               |     | X  |     |

Please indicate whether the project contributes to the introduction of procedures for the issuing of diploma supplements in the partner country university/ies. For information on the diploma supplement:
http://europa.eu.int/comm/education/policies/rec_qual/recognition/diploma_en.html
**Comments if any:**

| **Adoption of a system based on two main cycles, undergraduate (Bachelor) and postgraduate (Master)** | X | | |

Please indicate whether your project contributes to the achievement of the adoption of a system based on two main cycles.
**Comments if any:**

| **Introduction of a double or joint degree**         |     | X  |     |

Please indicate whether in the framework of your project the involved institutions agreed to issue double or joint degrees.
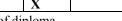**Comments if any:**

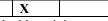| **Establishment of a system of ECTS to promote student mobility** | X | | |

Please indicate whether your project contributes to the introduction and/or development of the European Credit Transfer System at the consortium partner University(ies). For information on ECTS:
http://europa.eu.int/comm/education/programmes/socrates/ects/index_en.html

**Comments if any:**

**Promotion of European co-operation in quality assurance** | X | | |

Please indicate whether your project promotes European co-operation in quality assurance. For information on the 'Standards and guidelines for quality assurance in the European higher education area: http://www.bologna-bergen2005.no/Docs/00-Main_doc/050221_ENQA_report.pdf
**Comments if any:**

**Lifelong learning as an essential element of the European Higher Education Area** | | X | |

Please indicate whether your project contributes to lifelong learning.
**Comments if any:**

**Promoting the attractiveness of the European Higher Education Area** | X | | |

Please indicate whether your project promotes the attractiveness of the European Higher Education Area.
**Comments if any:**

**Other credit systems** | | X | |

Please indicate whether your project contributes to the introduction and/or development of a credit transfer system (other than ECTS) at the consortium partner University/ies.
**Comments if any:**

**Modular structure of curriculum** | X | | |

Please indicate whether the curriculum/curricula which is to be developed in the framework of your project has/have a modular structure.

**Comments if any:**

**New teaching and learning methods** | X | | |

Please indicate whether the project contributes to the development of new teaching/learning methods at the partner country university/ies.
**Comments if any:**

**Quality assurance** | X | | |

Please indicate whether the project contributes to the enhancement of the partner country university/ies strategies for quality assurance.
**Comments if any:**

**e-Learning** | | X | |

Please indicate whether the project contributes to the development of an e-learning strategy at the partner country university/ies.
**Comments if any:**

**University/Enterprise cooperation** | X | | |

Please indicate whether the project foresees the implementation of co-operation activities between the partner country university/ies and the entrepreneurial sector.
**Comments if any:**

**Links to the labour market in degree programmes** | X | | |

Please indicate whether the new/restructured curriculum/curricula has/have been developed in order to respond directly to the needs of the local and national labour market through internships, intensive training in the field, etc.
**Comments if any:**

**Links with other EU education programmes** | | X | |

Please indicate whether your project is linked to other EU educational programmes other than Tempus. For information on the EU educational programmes: http://europa.eu.int/comm/education/index_en.html.
**If yes, please indicate to which EU educational programme your project is linked.**
**Comments if any:**

**Set up of project website**

| | | |
|---|---|---|
| X | | |

Please indicate whether a project website has been created and provide its web address.

**Web address:** : Niš University http://venus.elfak.ni.ac.yu/ and SkopjeUniversity
http://e-tech.etf.ukim.edu.mk/e-tech/Projects/SystemonChipTEMPUS/tabid/104/language/en-US/Default.aspx

**Qualification frameworks**

| | | |
|---|---|---|
| | X | |

Please indicate whether the project contributes to the development of an educational policy and/or strategy in the partner country university/ies that takes into consideration the European Qualification Framework's principles. For information on the European Qualification Framework:
http://europa.eu.int/comm/education/policies/2010/consultations_en.html
**Comments if any:**

**Teacher training in:**
Please indicate whether your project has links with Vocational Education and Training and if so, whether it is within the one of categories listed below.

| | | | |
|---|---|---|---|
| **Language** | | | X |
| **Numeracy** | | | X |
| **Literacy** | | | X |
| **IT skills** | | | X |
| **Social and inter-cultural skills** | | | |

**Comments if any:**

**Links with VET in:**
Please indicate whether your project has links with Vocational Education and Training and if so, whether it is within the one of categories listed below.
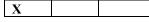
| | | | |
|---|---|---|---|
| **Adult training** | | | X |
| **Non-formal and informal education** | | | X |
| **Active citizenship** | | | X |
| **Occupational guidance and counselling** | | | X |

**Comments if any:**

**EXAMPLE**
**USE ONE TABLE PER OUTCOME : ADD AS MANY TABLES AS NECESSARY**

# TABLE OF ACHIEVED/PLANNED OUTCOMES

*Insert the title and reference number as indicated in your project proposal*

| Title and reference number of the outcome: | |
|---|---|

| Indicators of achievement and or/performance as indicated in the project proposal | |
|---|---|

*Insert the indicators of achievement and/or performance as indicated in your project proposal*

*Insert specific indicators (qualitative and quantitative) which can help to measure the achievement of the activity result*

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

*Number each activity progressively*

*Insert the activity title as indicated in your previous report*

*State where and when the activity takes place*

*Provide a brief description of the activity*

**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
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*Insert specific indicators (qualitative and quantitative) which can help to measure the progresses towards the activity result*

**Proposed changes from the previous approved report for the outcome in reference**

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*Describe any change compared to the activity plan described in the previous report*

**Implementation report and financial statement**  
**Tempus Joint European Project N**:........................

**Annex III/67**  
**Table of achieved/planned outcomes**

# TABLE OF ACHIEVED/PLANNED OUTCOMES

| **Title and reference number of the outcome:** | 1. Curriculum development |
|---|---|

| **Indicators of achievement and or/performance as indicated in the project proposal** | New master courses, syllabi, textbooks , laboratory exercises, accompanying software, manuals, teaching presentations |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
| 1.1 | Review of syllabi for all CAD courses at both regional member institutions | 15/09 /2007 | 15/12 /2007 | Niš, Skopje, Southampton, Madrid | • Representatives of all consortium members meet. After a short overview of existing syllabi at both regional universities, a detailed plan of activities generated.<br>• All professors of member departments at regional universities review in detail the syllabi of all existing courses at their departments, as well as all of the courses at EU member universities.<br>• In five weeks, with intense inter-university communication and consultations (via email, fax and local travel), a working list of proposed courses, with explanations (in Serbian, Macedonian and English), sent to EU member universities.<br>• EU member professors review the material and give comments and suggestions of changes. | All syllabi for CAD courses reviewed at both PC universities |
| 1.2 | Make a working list of proposed courses and the course of study | 15/12 /2007 | 15/02 /2008 | Niš, Skopje, Southampton, Madrid | • Regional universities' professors review the comments from 1.1.<br>• A list of proposed courses (masters) and courses of study defined, in Serbian, Macedonian and English. | The proposal list of courses made |
| 1.3 | Define syllabi for all (old and new) courses | 16/02 /2008 | 30/06 /2008 | Niš, Skopje, Southampton, Madrid | • Starting from the list of courses from 1.2, and the material from 1.1, first outlines of syllabi for all courses made.<br>• First outlines of syllabi analysed in detail by EU professors.<br>• Representatives of all consortium members meet (see 6.1.) A detailed plan of syllabi at all three regional universities discussed.<br>• In accordance with the conclusions of the meeting, detailed syllabi generated by PC professors.<br>• Detailed syllabi revised periodically by the EU professors | Syllabi for all (old and new) courses defined |

**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 1.4 | Develop new teaching materials | 01/07 /2008 | 31/05 /2009 | Niš, Skopje | • Starting from the detailed syllabi from 1.3, 10, textbooks written (or revised, where existing). <br>• For each course, laboratory exercises are devised, necessary software and manuals written. <br>• For each course, teaching presentations for courses prepared <br>• Notebook PC and projector purchased for UN and US | New teaching materials developed (textbooks, laboratory exercises, accompanying software, manuals, teaching presentations) |
| 1.5 | Publish developed teaching materials | 01/06 /2009 | 31/08 /2009 | Niš, Skopje | • Textbooks and lab manuals prepared for printing. <br>• Textbooks and lab manuals published | Textbooks and lab manuals published |

<u>**Proposed changes from the previous approved report for the outcome in reference**</u>

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| <u>**Title and reference number of the outcome:**</u> | 2. Lab restructuring |
|---|---|

| <u>**Indicators of achievement and or/performance as indicated in the project proposal**</u> | New laboratory equipment, accompanying software |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
| 2.1 | Existing laboratory facilities investigated | 15/01 /2008 | 15/03 /2008 | Niš, Skopje | • Making a list of existing equipment in laboratory for students. All equipment (test equipment and computers) included. <br>• In accordance with student enrolment rates and available laboratory area, laboratory use analysed (number of lab working hours per week) <br>• Report for second consortium members' meeting | Present laboratory facilities examined |
| 2.2 | Purchase of new laboratory equipment | 01/04 /2008 | 05/12 /2008 | Niš, Skopje | • In accordance with first syllabi revision (see activity 1.3), and the report from 2.1, plan for lab exercises established at second consortium members' meeting. Meeting inputs covered under activity 9.1). <br>• After second consortium members' meeting, UN and US staff | The tender for new laboratory equipment |

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| | | | | define necessary measurement and computer equipment for each course lab exercises.<br>• In accordance with expected number of students, available laboratory area, and limit imposed by funding, new lab equipment for System of chip design courses specified. Lab equipment unified for all courses and all student groups.<br>• Lab equipment and special lab working conditions for advanced SoCD courses defined.<br>• Order of lab equipment | |
| | | | | | |

**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 2.2 | Purchase of new laboratory equipment | 05/12 /2008 | 31/12 /2008 | Niš, Skopje | • Purchase of lab equipment<br>• Electronics components, prototype boards, IC and printing boards fabrication, and other material for current needs in laboratory specified and purchased/paid for. | New laboratory equipment acquired |
| 2.3 | Lab equipment installation and integration with existing equipment | 01/01 /2009 | 31/03 /2009 | Niš, Skopje | • Laboratory adaptation for new equipment installation<br>• Installation of new lab equipment<br>• Integration of new and existing lab equipment<br>• EU consortium members inspect installation of new laboratory equipment | Lab equipment installed and integrated with existing equipment |
| 2.4 | Training of the laboratory technicians | 01/04 /2008 | 30/06 /2008 | Niš, Skopje | • Training of the lab technicians to use new measurement equipment<br>• Training of the research/teaching assistants on new software | The laboratory technicians trained |
| 2.5 | Adaptation of labs to support all courses in 1.2 | 01/07 /2009 | 31/08 /2009 | Niš, Skopje | • For each course, laboratory equipment and necessary software will be adopted in two phases<br>• Reports prepared for the following consortium members' meeting after each phase<br>• EU consortium members inspects suitability of new lab exercises for courses defined in 1.2 | The labs adapted to support all new courses |

**Proposed changes from the previous approved report for the outcome in reference**

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Table of achieved/planned outcomes

| Title and reference number of the outcome: | 3. Teacher's training |
|---|---|

| Indicators of achievement and or/performance as indicated in the project proposal | Trained professors and lecturers from the partner countries, best students to be teaching assistants, new research/teaching assistants by last-year's research/teaching assistants |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
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**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 3.1 | (Re)training of professors and lecturers from the partner countries | 01/12 /2008 | 31/07 /2009 | Niš, Skopje, Southampton, Madrid | • Each of participating PC professors visit the participating EU universities and studies teaching methods. EU professors visit PC universities. | Trained professors and lecturers from the partner countries |
| 3.2 | Training of best students to be teaching assistants | 15/01 /2009 | 31/07 /2009 | Niš, Skopje, Southampton, Madrid | • During their stay at EU Universities, students participating in the pilot exchange program (see activity 5.1) study teaching and research methods, guided by the PC professors (from activity 3.1) and EU professors.<br>• After the students return to their universities, they are trained by their professors to be teaching/research assistants during the next semester.<br>• The trained students assist teaching during the following semester. | Trained best students to be teaching assistants |
| 3.3 | Training of new research/teaching assistants by last-year's research/teaching assistants | 01/05 /2009 | 31/08 /2009 | Niš, Skopje | • Each of the students participating in activity 3.2, after finishing with a semester as a teaching/research assistant, coaches a student from the following class to be teaching assistant for the next semester.<br>• The "new" research/teaching assistants teach for one semester, after which they coach a student from the following class to be research/teaching assistant for the next semester, and so on, continuing after the termination of the project. | Trained new research/teaching assistants by last-year's research/teaching assistants |

**Proposed changes from the previous approved report for the outcome in reference**

**Implementation report and financial statement**
**Tempus Joint European Project N**:........................

**Annex III/71**
**Table of achieved/planned outcomes**

| New dates defined due to 8-month delay because of the plan revision and the equipment purchase. |
|---|

| **Title and reference number of the outcome:** | 4. Library, inter-partner sharing |
|---|---|

| **Indicators of achievement and or/performance as indicated in the project proposal** | Acquired new books, periodicals and library PCs |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
| 4.1 | Define a list of necessary books and periodicals | 01/10 /2007 | 30/11 /2007 | Niš, Skopje | • During the first consortium members' meeting, text-books, professional books and periodicals used at EU University partners institutions discussed, and their relevance for PC partner universities assessed<br>• PC professors define lists of necessary books<br>• PC professors define lists of necessary periodicals | The list of necessary books and periodicals |
|  |  |  |  |  |  |  |

**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 4.2 | Purchase library PCs, books and periodicals | 01/12 /2007 | 01/04 /2009 | Niš, Skopje | • Purchase one PC at each PC university for inter-departmental-library communication. (These PCs will enable staff and students of all PC participating universities to share library resources.)<br>• Purchase books<br>• Subscribe to periodicals for each project year | Acquired new books, periodicals and library PCs |

**Proposed changes from the previous approved report for the outcome in reference**

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| **Title and reference number of the outcome:** | 5. Pilot student exchange |
|---|---|

| **Indicators of achievement and or/performance as indicated in the project proposal** | PC students stays at EU universities |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
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**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 5.1 | Students from PC partners spend 3 months at EU institutions | 15/01 /2009 | 31/07 /2009 | Southampton, Madrid | • Students spend three months each at participating EU universities. The participating students will be graduate students, or undergraduate students who have either completed or are very near completion of their coursework. These students will spend their stay at a participating EU University doing their bachelors or masters work. In the last semester, participating students would be expected to do coursework, as a test of the proposition that a normal student exchange is possible between non-English speaking countries, and to test the introduced ETC system. The participating students will be chosen with four criteria in mind: 1. Efficiency of studies (GPA, number of passed exams per year), 2. Area of interest (so that each of the areas defined by curriculum from outcome 1 is covered), 3. Willingness to spend one semester teaching at home department and to coach their successors (see activity 3.3), and 4. Language skills. (10 students, one month each) | PC students stays at EU universities.<br><br>The three-month student stays will be carried out in the second semester of the 2008-2009 schoolyear i.e. in the period from January 15th until July 31st, 2009 as the last day before summer vacations. Each EU center will receive two students from Niš University and one student from Skopje University that makes six 3-month student flows in total. |

**Proposed changes from the previous approved report for the outcome in reference**

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**Table of achieved/planned outcomes**

| Title and reference number of the outcome: | 6. Dissemination |
|---|---|

| Indicators of achievement and or/performance as indicated in the project proposal | Web site; Distribution of the whole package of tangible outputs (syllabi, textbooks, lab manuals, library inventory, etc) to all universities in the region; Final dissemination event. |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
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**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 6.1 | Dissemination analyzing and actions planning | 01/09 /2008 | 31/08 /2009 | Niš, Skopje | • In the month just before the mid-year consortium member meeting, make detailed plans on how to ensure dissemination of the project results. Prepare a report stating all actions for the meeting.<br>• Discuss the report at the meeting and make suggestions for improvement.<br>• Prepare the final report and include in final project report.<br>• In the last month of the second year, start the actions defined in the report (talks at region conferences and symposia about project results; tutorials and/or summer schools will be held).<br>• In the last month of the project when all project outputs are available, distribute the whole package of tangible outputs (syllabi, textbooks, lab manuals, library inventory, etc) to all universities in the region (Serbia, Montenegro, Kosovo, BIH, and Macedonia).<br>• The results of the project in form of detailed information about all of the courses and the degree as a whole, post on the web sites of the local participating universities. Update the content of these web sites at least once each semester to contain the general information about the departments, the faculty and the university it belongs to, student accommodation and administrative procedures necessary to register. The faculty page to have the list of all courses and | Web sites at each PC universities;<br><br>Niš University presented "System on Chip Design – new curriculum at Faculty of Electronics, Nis" at 3$^{rd}$ ICT Forum, Nis, Serbia, November 4-6, 2008 and INDEL 2008 Conference, Banjaluka, , November 6-8, 2008<br><br>Joint Workshop with two other Tempus projects during the TREND 2009 Conference at Kopaonik, Serbia (March 2$^{nd}$-5$^{th}$, 2009). Both PC partners prepare papers.<br><br>Distribution of the whole package of tangible outputs (syllabi, textbooks, lab manuals, library inventory, etc) to all universities in the region;<br><br>Final dissemination event at |

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**Table of achieved/planned outcomes**

| | | | | | their ECTS credits, syllabi, prerequisites, grading and teaching methods, in order to provide information to all interested students. Contents of all web pages to be in local language, as well as in English. | ETRAN Conference in the first week of June 2009. This conference is the biggest event in the field with the major audience in the region. |
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**Proposed changes from the previous approved report for the outcome in reference**

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| **Title and reference number of the outcome:** | 7. Sustainability |
|---|---|

| **Indicators of achievement and or/performance as indicated in the project proposal** | The measures that will guarantee that the continuation of the SoC courses after the end of the project. |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
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**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 7.1 | Sustainability analyzing and actions planning | 01/09 /2008 | 31/08 /2009 | Niš, Skopje | • The procedure of acceptance of the list of courses by the Nis and Skopje university authorities to started after completion of activity 1.3.<br>• In the month just before each mid-year consortium member meeting, make detailed plans on how to ensure sustainability of the project results. A report stating all actions will be prepared for the meeting.<br>• Discuss the report at the meeting and make suggestions for improvement.<br>• Prepared the final report and include in final project report.<br>• During the last year of the project, monitor and improve the training and work of new teacher-assistants (activity 3.3) to ensure the sustainability of the process. | the trained new teacher-assistants that ensure the sustainability of the process<br><br>The SoC Master Courses accredited by the respective ministries at both PC countries. |

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**Annex III/75**
**Table of achieved/planned outcomes**

**Proposed changes from the previous approved report for the outcome in reference**

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| **Title and reference number of the outcome:** | 8. Quality control and monitoring |
|---|---|

| **Indicators of achievement and or/performance as indicated in the project proposal** | |
|---|---|

**Activities carried out to date for the achievement of this outcome**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity carried out | Specific and measurable indicators of achievement |
|---|---|---|---|---|---|---|
| | | | | | | |

**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
| 8.1 | Quality control and monitoring ensured | 01/09 /2007 | 31/08 /2009 | Niš, Skopje | • Each PC University prepares semi-annual quality control reports<br>• Semi-annual quality control reports by each PC University presented and discussed at each consortium meeting.<br>• EU representatives at consortium meetings taking place in PC inspect all work done at PC Universities, as well as talk with all students who came back from a semester at EU universities and students who took new/revised courses.<br>• Contracting University will be responsible for the Mid-project and Final quality control reports. The Final quality control report is a part of Final project report (see 9.2). | • New course syllabi introduced<br>• New teaching materials (books, lab practicals, web presentations, …) published<br>• Laboratory facilities installed<br>• Laboratory facilities intensively used in all courses<br>• Consortium meetings held on schedule<br>• Teachers (re)trained<br>• Students' work at EU Universities recognised<br>• Student satisfaction with revised courses and student exchange program |

**Proposed changes from the previous approved report for the outcome in reference**

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| **Title and reference number of the outcome:** | 9. Management of the project |
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| **Indicators of achievement and or/performance as indicated in the project proposal** | Meetings, reports |
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**Activities carried out to date for the achievement of this outcome**

| **Activity N°** | **Activity Title** | **Start date** | **End date** | **Place** | **Description of the activity carried out** | **Specific and measurable indicators of achievement** |
|--|--|--|--|--|--|--|
| 9.1 | Future activities planned (consortium members meeting) | 01/09 /2007 | 10/06 /2009 | Niš, Skopje, Southampton, Madrid | • One week consortium member meetings take place once a year at EU consortium members' institutions. <br> • One week consortium member meetings take place once a year at PC consortium members' institutions. <br> • At the meetings each project participant institution presents its progress and discusses future activities. | Project meetings: Southampton, Nov. 2007 Niš, May 2008 Ohrid, Sept. 2008 |
| 9.2 | Progress reviewed | 01/09 /2007 | 31/08 /2009 | Niš, Skopje, Southampton, Madrid | • Each consortium member institution prepares the progress reports semi-annually and presents at consortium members meeting. <br> • The progress reports discussed at the meeting. <br> • The Co-ordinating institution compiles all progress reports into yearly Consortium progress reports <br> • The contractor university approves the Consortium Progress report. <br> • The Final Progress report (at the end of the project) published and distributed to all Universities in PC and neighbouring countries. <br> • One part time secretary/accountant at the Contracting Consortium member institution and 1 part time secretary/accountant at the Co-ordinating Consortium member institution take care of all secretarial and accounting duties related to the project, visas, etc. | Project meetings: Southampton, Nov. 2007 Niš, May 2008 Ohrid, Sept. 2008 |

**Activities to be carried out for the achievement of this outcome (entire project period: 2 or 3 years)**

| Activity N° | Activity Title | Start date | End date | Place | Description of the activity to be carried out | Specific and measurable indicators of progress |
|---|---|---|---|---|---|---|
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**Proposed changes from the previous approved report for the outcome in reference**

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Please add as many tables as necessary.

# Summary Report for Publication

**Project title**

System on chip design (SoCD)

**Project duration (with starting and ending dates)**

1/9/2007 –31/8/2009

**Project partners (with contacts details of contact persons in the Partner country/ies and the EU)**

UNIVERSIDAD POLITECNICA DE MADRID
Mr OCTAVIO NIETO-TALADRIZ - Ciudad Universitaria s/n - 28040 Madrid , Spain
Phone: +34/91/3367300 - Fax: +34/91/3367323 - Email: nieto@die.upm.es

UNIVERSITY OF NIS, Faculty of Electronics
Mr VANCO LITOVSKI - Aleksandra Medvedeva 14 - 18000 Nis , Serbia
Phone: +381/18/529224 - Fax: +381/18/588447 - Email: vanco@elfak.ni.ac.yu

UNIVERSITY OF SOUTHAMPTON, School of Electronics and Computer Science
Mr MARK ZWOLINSKI - University Road, SO17 1BJ Southampton, GB
Phone: +44/23/ 80593528- Fax: +44/23/80592901- Email: mz@ecs.soton.ac.uk

UNIVERSITY 'STS. CYRIL AND METHODIUS', Faculty of electrical engineering and information technologies
Mr DIMITAR TRAJANOV, Karpoš II bb, 1000 Skopje, FYR Macedonia
Phone: +389/2/3099153 – Fax: +389/2/3064262 - Email: mite@etf.ukim.edu.mk

**Project budget (with an indication of budget co-funded)**

Tempus Grant: € 299,089.00
Pre-financing: € 179,453.40
Cost of action: € 329,089.00
Co-financing: € 30,000.00

**Objectives**

Improve Electronic integrated circuit design curricula (system on chip) at masters level by updating/creating courses.
Development of laboratory practices and introduction to project fabrication and testing.
Teacher-student ratio improvement.
Textbook publishing.

**Outcomes**

1. Curriculum development
2. Lab restructuring
3. Teacher's training
4. Library, inter-partner sharing
5. Pilot student exchange
6. Sustainability
7. Dissemination
8. Quality control and monitoring
9. Management of the project

## Activities

1.1  Review of syllabi for all CAD courses at both regional member institutions
1.2 Make a working list of proposed courses and the course of study
1.3 Define syllabi for all (old and new) courses
1.4 Develop new teaching materials
1.5 Publish developed teaching materials

2.1 Existing laboratory facilities investigated
2.2 Purchase of new laboratory equipment
2.3 Lab equipment installation and integration with existing equipment
2.4 Training of the laboratory technicians
2.5 Adaptation of labs to support all courses in 1.2

3.1 (Re)training of professors and lecturers from the partner countries
3.2 Training of best students to be teaching assistants
3.3 Training of new research/teaching assistants by last-year's research/teaching assistants

4.1 Define a list of necessary books and periodicals
4.2 Purchase library PCs, books and periodicals

5.1 Students from PC partners spend 3 months at EU institutions
6.1 Sustainability analyzing and actions planning
7.1 Dissemination analyzing and actions planning
8.1 Quality control and monitoring ensured
9.1 Future activities planned (consortium members meeting)
9.2 Progress reviewed

## Main staff members involved

Prof Octavio Nieto-Taladriz, Universidad Politecnica de Madrid, Spain
Prof Vančo Litovski, University of Nis, Serbia
Prof Dimitar Trajanov, University 'Sts. Cyril And Methodius', FYR Macedonia
Prof Mark Zwolinski, University of Southampton, GB
Prof Slobodan Bojanić, Universidad Politecnica de Madrid, Spain
Prof Predrag Petković, University of Nis, Serbia
Prof Aksenti Grnarov, South East European University, Tetovo, FYR Macedonia and
                Sts. Cyril  and Methodius University, Skopje, FYR Macedonia

## Progress to date

The project is progressing as planned after the 8-month delay due to the delay in approval of the revised plan. In the coming period the activities will be accelerated to meet the deadlines.

## Problems in project implementation

The problems regarding the equioment purchase are overcome i.e. all administrative steps are finalized and the equioment is expected to be purchased during December 2008..

## Next steps

Equioment purchase, laboratory installation, staff exchange, joint workshop, final dissemination event.

## Other remarks

Since January 1st, 2008, Prof Dimitar Trajanov is the new contact person at University 'Sts. Cyril And Methodius', FYR Macedonia instead of Prof Aksenti Grnarov who is now Head of Computer Engineering (Information - Communication Technologies) Department, Faculty of Contemporary Sciences, South East European University, Tetovo, FYR Macedonia and professor on master studies at the Faculty of Electrotechnics and Information Technologies, Sts. Cyril and Methodius University, Skopje. Prof Grnarov continues to actively participate in our project.

# ACKNOWLEDGEMENT OF RECEIPT

> Your name: Octavio Nieto-Taladriz
>
> Complete address:
> Universidad Politécnica de Madrid
> ETSI Telecomunicaciòn
> Ingenierìa Electrònica
> Ciudad Universitaria s/n
>
>
> | ES | 28040 | Madrid |
> | Country code | Postal code | City |

**This page of the form will be returned to you on receipt of your second implementation report. Therefore please enter your name and address in the box above. Please remember to send in this page with each of your reports.**

For internal use only

| Joint European Project N° |

under the Tempus programme.

Yours sincerely,

Done at ......................................,          Date ...............................

# CHECKLIST

## WHAT INFORMATION TO BE SENT?

☐ **Declaration: duly signed by the grantholder and the legal representative - Annex III/2**

☐ **Report on the action's implementation - Annex III/3-5**

☐ **Statistics and Indicators – Annex III/6-9**

☐ **Table on achieved/planned outcomes - Annex III/11-XX**

☐ **Summary report for publication - Annex III/12-13**

☐ **Acknowledgement of receipt – Annex III/14**