

Project Acronym: MEDIS

Project Title: A Methodology for the Formation of Highly Qualified Engineers at Masters Level in the Design and Development of Advanced Industrial Informatics Systems

Contract Number: 544490-TEMPUS-1-2013-1-ES-TEMPUS-JPCR

Starting date: 01/12/2013

Ending date: 30/11/2016

Deliverable Number: 5.1

Title of the Deliverable: Implementation AIISM

Task/WP related to the Deliverable:

Type (Internal or Restricted or Public): Internal

Author(s): Shynar Mussiraliyeva

Partner(s) Contributing:

Project Co-ordinator

Company name :	Universitat Politecnica de Valencia (UPV)
Name of representative :	Houcine Hassan
Address :	Camino de Vera, s/n. 46022-Valencia (Spain)
Phone number :	+34 96 387 7578
Fax number :	
E-mail :	husein@upv.es
Project WEB site address :	

Contractual Date of Delivery to the CEC:

Actual Date of Delivery to the CEC:

Context

WP 5	Implementation AIISM
WPLLeader	NTUU-KPI
Task 5.1	Implementation of AIISM - Pilot implementation
Task Leader	TSU
Dependencies	

Author(s)	Shynar Mussiraliyeva
Contributor(s)	
Reviewers	

History

Version	Date	Author	Comments
1	2016/07/02	Shynar Mussiraliyeva	Final version

Table of Contents

1	Executive summary	3
2	The implementation of AIISM Courses.....	3
3	Description AIISM Courses at KAZNU	5
3.1	Industrial Computers module.....	5
3.2	Industrial controllers and simulators	5
3.3	Mobile and Cloud Computing module.....	6
3.4	Industrial Networks and Fieldbuses module	6
3.5	Microcontroller based systems for controlling industrial processes.....	6
4	Student Assesment.....	7
5	Supporting documents.....	9
9	Conclusion	9
10	References.....	9

1 Executive summary

This deliverable presents the report on the pilot implementation of AIISM at the Faculty of Mechanics and Mathematics, Department of Informational Systems that is responsible for MEDIS Project in al-Farabi Kazakh National University.

2 Pilot implementation of AIISM Courses

5 AIISM courses were integrated into curricula for the Master Program “Automation and Control” as an educational trajectory “TEMPUS MEDIS”. For the 2015-2016 educational years as a pilot implementation 2 AIISM courses were integrated into curricula for the Master Program “Information Systems” and “Security Information Systems”. (see also Application 1 – 6M070200, Automation and Control, Application 2 – 6M070300, Information Systems, Application 3 – 6M100200, Information Security Systems.)

AIISM courses titles are exactly the same as EU partners proposed. The distribution of academic hours is shown in the Table 1.

Table 1.

Subject	Semester	ECTS Credits	Academic Hours per Semester					Academic Hours per Week		
			Total	Lectures	Seminars	Laboratory Lessons	Independent Work	1 Semester	2 Semester	3 Semester
Industrial Computers	1	5	105	15	15	30	45	4		
Industrial controllers and simulators	1	5	105	15	15	30	45	4		
Microcontroller based systems for controlling industrial processes	1	5	105	15	15	30	45	4		
Mobile and Cloud Computing	3	5	105	15	15	30	45			4
Industrial Networks and Fieldbuses	3	5	105	15	15	30	45			4

As it is presented in the Table 1, every subject has equal number of ECTS credits, namely 5 ECTS credits that is an equivalent of 105 academic hours. This total number of academic

hours is divided to 60 contact hours and 45 academic hours of independent student's work. Contact hours include 15 academic hours of lectures, 15 academic hours of seminars and 30 academic hours of laboratory lessons.

Contact hours of 60 academic hours per a semester correspond to 4 academic hours per a week (the detailed information on education process at KazNU was presented in Section 6 of Report on WP3).

The 3 courses: Industrial computers, Industrial controllers and simulators, Microcontroller based systems for controlling industrial processes were implemented as a Compulsory Professional Modules. The courses Mobile and Cloud Computing and Industrial Networks and Fieldbuses as a Modules of Individual Educational Trajectories "Design and development of the advanced industrial information systems (TEMPUS MEDIS)".

3 Program Proposal of EU Partners

3.1 Industrial Computers module

Module "Industrial Computers" was conducted by Nikolay Azanov. Leader from EU Partners – Universitat Politècnica deValència (UPV), Dr. Houcine Hassan. The next groups of Master students were attending these classes.

1. Automation and Control, scientific direction(2years), 1st year. Kazakh group, 11 students
2. 6M070200, Automation and Control, professional direction (1,5 years). 1st year. English group, 16 students
3. 6M070200, Automation and Control, professional direction (1,5 years). 1st year. Russian group, 12 students
4. 6M070200, Automation and Control, professional direction (1,5 years). Kazakh group, 13 students

Syllabus is attached as Application 4.

3.2 Industrial controllers and simulators

Module "Industrial Computers" was conducted by Ablay Eraliyev. Leader from EU Partners – TUSofia - Technical University of Sofia, Dr. Ivan Evgeniyev The next groups of Master students were attending these classes.

1. Automation and Control, scientific direction(2years), 1st year. Kazakh group, 11 students
2. 6M070200, Automation and Control, professional direction (1,5 years). 1st year. English group, 16 students
3. 6M070200, Automation and Control, professional direction (1,5 years). 1st year.

Russian group, 12 students

4. 6M070200, Automation and Control, professional direction (1,5 years). Kazakh group, 13 students

Syllabus is attached as Application 5.

3.3 Mobile and Cloud Computing module

Module “Mobile and Cloud Computing ” was conducted by Nikolay Azanov. Leader from EU Partners – MDU - Mälardalen University , Dr. Dobrin Radu. The next group of Master students were attending these classes: Information Security Systems, 1st year. Russian group, 4 students

Syllabus is attached as Application 6.

3.4 Industrial Networks and Fieldbuses module

Module “Industrial Networks and Fieldbuses” was conducted by Mario de Sousa(lecturer) and Shynar Mussiraliyeva(assistant). Leader from EU Partners – University of PORTO, Dr. Mario de Sousa. The next groups of Master students were attending these classes.

1. 6M070200, Automation and Control, scientific direction(2years), 1st year. Kazakh group, 11 students
2. 6M070200, Automation and Control, professional direction (1,5 years). 1st year. English group, 16 students
3. 6M070200, Automation and Control, professional direction (1,5 years). 1st year. Russian group, 12 students
4. 6M070200, Automation and Control, professional direction (1,5 years). Kazakh group, 13 students

Syllabus is attached as Application 7.

3.5 Microcontroller based systems for controlling industrial processes

Module “Industrial Networks and Fieldbuses” was conducted by Baurzhan Belgibayev. Leader from EU Partners – Stuttgart, USTUTT - University of Stuttgart, Dipl. Ing. Michael Seyfarth. The next groups of Master students were attending these classes.

1. 6M070200, Automation and Control, scientific direction(2years), 1st year. Kazakh group, 11 students
2. 6M070200, Automation and Control, professional direction (1,5 years). 1st year. English group, 16 students

3. 6M070200, Automation and Control, professional direction (1,5 years). 1st year. Russian group, 12 students
4. 6M070200, Automation and Control, professional direction (1,5 years). Kazakh group, 13 students

Syllabus is attached as Application 8.

4 Students Assessment

We collected all grades earned along the continuous assessment developed along the course and proceed to obtain the final grade for the module.

To do this we establish the following proportion between the different sections to ensure a fair rating for differentiating their individual acquisition of knowledge and skills against the student group work:

- The evaluation of the student attitude (A) a 10% of the final score.
- The evaluation of the miniproject represents (MP) a 40% of the final score.
- The evaluation of the Laboratory (L): 20% of the final score.
- The evaluation of the Problems (P): 15% of the final score.
- The evaluation of the Seminars (S): 15% of the final score.

With all the information of ratings and percentages described will get a single grade for each student.

Examinations (oral, written, other)

In addition to regular control – ongoing checks of students' performance during the semester, the academic policy of the al-Farabi National University provides for two more types of control:

1) interim control and 2) final control. Interim control is held on the 7th week and 15th week of the semester and aims to evaluate students' performance in the preceding period, in addition to results of regular control.

Regular and interim control is held in the form of quizzes, tests, presentations, essays, class discussions, roundtables, simulations and other assignments. The exact form of regular and interim control is determined by a lecturer depending on specifics of a concrete module and clearly described in a module syllabus.

Final control is an evaluation of students' academic achievements in studying each module. It is held as an examination at the end of the semester. Final examinations can be oral, written, in the form of tests, or take a combined form (oral-written or written-testing).

All implemented MEDIS courses were in the written form. Exam commission consists of 3 teachers. Lecturer of the course may not be commission member. Assessments of students are shown in the application 9.

The form of a final examination is suggested by a lecturer and must be approved by the department's Academic Board. Each module is assigned 100 points. The maximum number of points a student can collect as a result of two interim controls is 200, or 100 for each interim control. To be allowed to take a final examination, a student must collect not less than 50 points. The maximum number of points a student can get for a final examination is 100. A student's final grade depends on the total number of collected points, in accordance with the grading conversion table below.

The scale of knowledge's estimation

Letter Grade	Grade Point Value (GPA)	Percentage (%)	Conventional Grade
A	4	95-100	"Excellent"
A-	3,67	90-94	
B+	3,33	85-89	Good
B	3	80-84	
B-	2,67	75-79	
C+	2,33	70-74	"Satisfactorily"
C	2	65-69	
C-	1,67	60-64	
D+	1,33	55-59	
D	1	50-54	
F	–	0-49	Failure
I	–	–	Incomplete
W	–	–	Withdrawal
AW	–	–	Academic Withdrawal
AU	–	–	Audit
P/NP	–	65-100/0-64	Pass / No Pass

5 Supporting documents

By decision of the Academic Council of the Faculty of Mechanics and Mathematics, Department of Informational Systems of KazNU the MEDIS section of 5 subjects is recommended for including into Curricula of Master Program "Automation and Control", 1 subject Curricula of Master Program "Information Systems", and 1 subject Curricula of Master Program "Security Information Systems" in 2015/2016 academic year.

Application 1 – Curriculum, 6M070200, Automation and Control.

Application 2 – Curriculum, 6M070300, Information Systems

Application 3 – Curriculum, 6M100200, Information Security Systems

Application 4 – Syllabus, Industrial Computers

Application 5 – Syllabus, Microcontroller based systems for controlling industrial processes

Application 6 – Syllabus, Mobile and cloud computing

Application 7 – Syllabus, Industrial Networks and Fieldbuses module

Application 8 – Syllabus, Microcontroller based systems for controlling industrial processes

Application 9 – Students Assessment

6 Conclusion

5 AIISM courses were implemented during 2015-2016 educational years for the Master Programs “Automation and Control”, “Information Systems” and “Security Information Systems”. (see also Application 1 –6M070200, , Application 2 – 6M070300, Information Systems, Application 3 – 6M100200, Information Security Systems.)

7 References

1. Yevgeniya Sulema, Olena Temnikova, (2015) “INTELLECTUAL TUTORING SYSTEM FOR IMPLEMENTATION OF MEDIS PROJECT PROBLEM-BASED LEARNING METHODOLOGY”, Proceedings of the 15th International Scientific Conference “Intellectual Analysis of Information” (IAI-2015), Kiev, Ukraine.
2. Pfeifer N. E., Jarassova G. S., Ispulov N. A., Ospanova N. N., (2014) “MEDIS Structure of Educational Program Industrial Informatics”, HERALD of Pavlodar State University, (p. 150-158), Pedagogika, 2, 2014.
3. Galchonkov, O., & Lozienenko, N. (2015). “Advanced problem-based learning. The experience of the European universities participants to the TEMPUS MEDIS project”, Odes’kyi Politechnichniy Universytet. Pratsi, 1.
4. Houcine Hassan, Juan M. Martínez, Carlos Domínguez, Angel Perles, Juan V. Capella, José Albaladejo (2015). “m-IC: a Mobile Device based Multimedia Learning Methodology for Industrial Computing”, INTERNATIONAL JOURNAL OF ENGINEERING EDUCATION, Journal Citation Reports. Accepted for publication, May, 2, 2015.
5. Yessengaliyeva Zh., Mussiraliyeva Sh. (2015) “A Methodology for the Formation of Highly Qualified Engineers at Masters Level in the Design and Development of Advanced Industrial Information Systems”. Proceedings of the conference “Integration of education, science and business as the basis of innovation development of economy”, Almaty, Kazakhstan, 2015.
6. Book (2015): “Engineering Experiences in the Design of Advanced Industrial Informatics Systems”, ISBN: 978-84-606-9807-4, Authors: J.V. Busquets, J. Albaladejo, A. Perles, J.V. Capella, C. Domínguez, J.M. Martinez, H. Hassan, Mário Sousa, Luis Almeida, Paulo Portugal, Armando Sousa, Slobodanka Cenevska, Mahnaz Malekzadeh, Abhilash Thekkilakattil and Radu Dobrin, Michael Seyfarth, Yessengaliyeva Zhanna, Mussiraliyeva Shynnar, O.N. Galchonkov, N.V. Lozienenko.