

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: 3.1

Title of the Deliverable: Adaptation AIISM - Analyze Curricula

Task/WP related to the Deliverable:

Type (Internal or Restricted or Public): Internal

Author(s): Oleg Galchonkov

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 3	Adaptation of AIISM to specific curricula in PC
WPLLeader	NTUU-KPI
Task 3.1	Adaptation AIISM - Analyze Curricula
Task Leader	ONPU
Dependencies	
Starting date	
Release date	

Author(s)	Oleg Galchonkov
Contributor(s)	Ievgen Kravchenko
Reviewers	

History

Version	Date	Author	Comments
0.9	2014/1/30	Oleg Galchonkov	Preliminary version
0.95	2014/2/5	Ievgen Kravchenko	Improved preliminary version
1.0	2014/2/28	Oleg Galchonkov	Final version

Table of Contents

1	Executive summary	4
2	Introduction	4
3	Analysis of the Unit Responsible for MEDIS Project.....	5
4	Degree Structures.....	5
4.1	Master Programme “ Information control systems and technologies ”.....	5
4.2	Bachelor Programme “ Computer Science ”	6
5	Analysis of Possibilities for the Integration of AIISM Courses.....	8
6	Available Equipment	9
7	Conclusion	9

1 Executive summary

This deliverable presents the report on the analysis of the possibilities of AIISM courses integration in the curricula of Master Programs at the Institute of Computer Systems that is responsible for MEDIS Project in the Odessa National Polytechnic University.

2 Introduction

The Institute of Computer Systems was founded in 1964. It consists of six departments:

1. Department of Information Systems;
2. Department of Computer Systems;
3. Department of Computer Intellectual Systems and Networks;
4. Department of Computer Control Systems;
5. Department of System Software;
6. Department of Physics.

In the scientific field of the main research areas of the Institute include the development and application of various hardware and software systems for the industry, as well as the development and implementation of modern software.

In academic sphere the Institute of Computer Systems offers five Bachelor Programmes (4 years), 6 Specialist Programmes (one year after a Bachelor Programme) and 6 Master Programmes (1,5 years after a Bachelor Programme).

The Department of Information Systems conducts teaching in the following programs:

- Bachelor Programme “COMPUTER SCIENCE”
 - Master Programme / Specialist Programme “*Information control systems and technologies*”

The Department of Computer Systems conducts teaching in the following programs:

- Bachelor Program “COMPUTER ENGINEERING”
 - Master Programme / Specialist Programme “*Special-purpose Computer Systems*”

The Department of Computer Intellectual Systems and Networks conducts teaching in the following programs:

- Bachelor Programme “COMPUTER ENGINEERING”
 - Master Programme / Specialist Program “*Computer Systems and Networks*”.

The Department of Computer Control Systems conducts teaching in the following programs:

- Bachelor Programme “SYSTEM ENGINEERING”
 - Master Programme / Specialist Program “*Computer Control and Automation systems*”.

The Department of System Software conducts teaching in the following programs:

- Bachelor Program “SOFTWARE ENGINEERING”
 - Master Programme / Specialist Programme “*Systems Software*”
 - Master Programme / Specialist Programme “*Software Engineering*”

3 Analysis of the Unit Responsible for MEDIS Project

The Department of Information Systems has been chosen as the unit responsible for the fulfilment of MEDIS Project. This decision is caused by the following reasons:

1. The existing curricula of Master Programmes offering by this department have to be changed next year according to the reform in this academic branch. Thus, it will enable the integration of AIISM courses into new curricula easier than in other cases.
2. This department has solid long-term collaboration with IT-industry what will enable the receiving of the feedback about the quality of new Master Programme students' professional skills from the following organizations:
 - Association “IT Ukraine”; it unites 29 IT companies (including all large IT-development companies and IT-consulting companies) and 21 educational and research institutions (<http://www.itukraine.org.ua/en/>);
 - Leading IT-companies, such as LUXOFT (<http://www.luxoft.com>), SIGMA (<http://sigmaukraine.com.ua>), and NetCracker (<http://www.netcracker.com>).
3. This department has both relevant experience and high potential for the effective participation in the project. Additional staff from other departments can be involved to the project if necessary.

4 Degree Structures

4.1 Master Programme “Information Control Systems and Technologies”

The Master Programme 8.05010101 – “Information Control Systems and Technologies” includes 90 credits of ECTS. It is based on the Bachelor Programme 6.050101 – “Computer Science”.

The degree structure of the Master Programme 8.05010101 – “Information Control Systems and Technologies” for 2013/2014 academic year is presented in Table 1.

Table 1

First Year			
First Semester		Second Semester	
Course Title	Credit	Course Title	Credit
Intellectual Property	2	Methodology and organization of research	3
Civil Defence	1	Scientific activities, patent intellectual property	3
Labour Protection in the Branch	1	Modern mathematical methods in information technology	5
Quality and reliability of ICS	4,5	Pedagogy and Psychology at the Graduate School	3
Methods, models and technologies for designing ICS	5	Methods of teaching in higher education and the Bologna process	3

Continuation of Table 1

Analysis and re-engineering of business processes for ICS control objects	4,5	Methods and systems for decision support	5
Computational Intelligence	7	Distributed Information Systems and Technology	4
Modern control theory	5	Managing the development of information technology on the base of business enterprise architecture	4
Total	30	Total	30
Second Year			
Third Semester			
<i>Course Title</i>	<i>Credit</i>	<i>Course Title</i>	<i>Credit</i>
Scientific and pedagogical practice	13,5		
Perform a Master degree project	16,5		
Total	30		
Total for the Programme	90		

4.2 Bachelor Programme “Computer Science”

The Bachelor Programme 6.050101 – “Computer Science” includes 240 credits of ECTS. It is a basis for the Master Programme 8.05010101 – “Information Control Systems and Technologies”.

The degree structure of the Bachelor Programme 6.050101 – “Computer Science” for 2013/2014 academic year is presented in Table 2.

Table 2

First Year			
First Semester		Second Semester	
<i>Course Title</i>	<i>Credit</i>	<i>Course Title</i>	<i>Credit</i>
History of Ukraine	3	Foreign Language 3	1,25
History of Ukrainian Culture	2	Mathematical Analysis 1	6
Foreign Language 1	1,25	Physics 2	5
Mathematical Analysis 1	6,75	Algorithmic and Programming 2	5,5

Continuation of Table 2

Physics 1	5	Discrete Mathematics	6
Algorithmic and Programming 1	5,5	Electrical and electronics	3,25
Jurisprudence	2	Economy and Business	3
Informatics	4,5		
Total	30	Total	30
Second Year			
Third Semester		Fourth Semester	
<i>Course Title</i>	<i>Credit</i>	<i>Course Title</i>	<i>Credit</i>
Ukrainian Language (for Profession)1	0,75	Ukrainian Language (for Profession) 2	1,25
Foreign Language 3	1,25	Foreign Language 4	1,25
Mathematical Analysis 3	4,5	Object-Oriented Programming 2	3,5
Probability theory, stochastic processes and mathematical statistics	5,5	Web technology and web design 2	3,75
Theory of Algorithms	3,5	Philosophy	3
Object-Oriented Programming 1	6	Numerical Methods	3,5
Web technology and web design 1	5,5	Operating Systems	4
Computer graphics	3	Computer circuitry and computer architecture	4,75
		Theory of Information and Coding	5
Total	30	Total	30
Third Year			
Fifth Semester		Sixth Semester	
<i>Course Title</i>	<i>Credit</i>	<i>Course Title</i>	<i>Credit</i>
Ukrainian Language (for Profession) 3	1	Decision theory	4
Mathematical methods of operations research	4	Ecology	1,5
Organization of data and knowledge bases	5	Cross-platform programming	4
Data Mining	4	Technology for computer-aided design	4

Continuation of Table 2

Technology for creating software products	4,5	Technology of distributed systems and parallel programming	6
Computer Networks	5	Simulation of systems	4
Sociology	1,5	Religious Studies	1,5
Digital signal processing	5	Programming for specialized computer systems	3,5
		Psychology	1,5
Total	30	Total	30
Fourth Year			
Seventh Semester		Eighth Semester	
<i>Course Title</i>	<i>Credit</i>	<i>Course Title</i>	<i>Credit</i>
Political science	2	Information systems design	4
System analysis	4	Methods and systems of artificial intelligence	4
Information security technologies	4	Basics of labor protection	2
IT Project Management	4	Fundamentals of the theory of communication	2,5
Life Safety	2	Programming for mobile devices	4
Methods and techniques of computer information technology	5	Pregraduation Practical Training	4,5
Telecommunication services	4	Preparation of Diploma Project	9
Microprocessors in information and control systems	5		
Total	30	Total	30
Total for the Programme		240	

5 Analysis of Possibilities for the Integration of AIISM Courses

The analysis of both the proposed AIISM courses (fulfilled on the basis of available Deliverables of WP1) and the curricula of the programmes:

- Master Programme “Information control systems and technologies”,
- Bachelor Programme “Computer Science”

enables to conclude the following:

1. The duration of the proposed courses is 15 weeks and the duration of each semester in the Odessa National Polytechnic University is 18 weeks. Thus, 3 weeks can be used

- for additional lectures if necessary.
2. Master Program “Information control systems and technologies” can be used as the basis for AIISM implementation.
 3. The proposed AIISM courses can be integrated into curricula as courses of a variable part of a Master Program. According to current regulations a variable part equals to 19 credits of ECTS and may include several alternatives (elective courses). Thus, the proposed courses can be considered as elective courses to be chosen by students.
 4. The Bachelor Programme “Computer Science” doesn’t provide prospective Master students with sufficient knowledge in electronics (in particular in analog electronics) necessary for some AIISM courses. To overcome this knowledge gap the additional 3 weeks mentioned above can be used for introductory lectures.
 5. The Bachelor Programme “Computer Science” provides prospective Master students with good knowledge in computer architecture that will meet requirements of AIISM courses.
 6. The Bachelor Programme “Computer Science” provides prospective Master students with good knowledge in programming that will fully satisfy requirements of AIISM courses.

6 Available Equipment

The Department of Information Systems has four computer laboratories. Every laboratory is equipped with modern PCs integrated into a local network with the connection to both Intra- and Internet as well as equipped with a projector.

The Department of Information Systems has several classrooms that can be reorganized into specialized laboratories according to MEDIS Project requirements.

7 Conclusion

The fulfilled analysis presented above (in particular in both Section 3 and Section 5) enables to conclude that the effective adaptation of AIISM into curricula the Master Programme “Information control systems and technologies” is possible as well as the unit responsible for the new curricula has enough potential for the successful implementation of MEDIS project.