



**ACCESSIBILITY AND HARMONIZATION OF HIGHER  
EDUCATION IN CENTRAL ASIA THROUGH CURRICULUM  
MODERNIZATION AND DEVELOPMENT**

**Project № 561553-EPP-1-2015-1-BG-EPPKA2-CBHE-JP**

**ERASMUS+ Programme  
KA2 - Capacity-building in the Field of Higher Education**

**Coordinated by Burgas Free University**

**WP1 Research  
Dev. 1.1  
App. 8.6 Institutional Report – IITU, Kazakhstan**



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Language	English

**INSTITUTIONAL SUMMARY REPORT – P6 IITU, Kazakhstan****A. General Information****COUNTRY:** Republic of Kazakhstan**INSTITUTION:** International Information Technology University, IITU**ADDRESS:** 34 «A»/8 «A» Manas /Zhandossov Str., Almaty, Kazakhstan, 050040**Departments:**

1. Computer Engineering and Telecommunications Department (CET)
2. Information Systems Department (IS)
3. Mathematical and Computer Modeling (MCM)

**B. Information related to Engineering and Engineering Trade Subject Area****I. Academic Programs in Engineering and Engineering Trade Subject Area**

Please, specify only Bachelor's and/or Master's Degree Programs which the university is expected to provide education in over the period of the Project (the next three academic years: 2015-18)<sup>1</sup>, with indication of the Area (see table) where the academic program should be considered.

Engineering	<b>Area 1</b>
Engineering Trade	<b>Area 2</b>

*Table 1. Description of Academic Programs in the field of Engineering and Engineering Trade*

Area	Name of the Academic Program	Educational degree provided (Bachelor, Master)	Form of study (part-time, full-time, distant education)	Approximate total number of students	Total number of academic staff
Area 1	Computer engineering and software	Bachelor	full-time	500	40
Area 1	Computer engineering and software	Master	full-time	50	15
Area 1	Computer engineering and software	Bachelor	part-time	50	15
Area 1	Information Security Systems	Bachelor	full-time	15	10

<sup>1</sup>If the university does not offer academic programs in Engineering and Engineering Trade subject area, please, in Table 1 fill in academic programs whose program's curriculum includes courses/subjects related to Engineering Sciences.

Area 1	Radioengineering, electronics and telecommunications	Bachelor	Full-time	280	20
Area 1	Radioengineering, electronics and telecommunications	Bachelor	part-time	15	20
Area 1	Information systems	Bachelor	full-time	717	71
Area 1	Information systems	Bachelor	Part-time	18	8
		Master	full-time	82	15

**II. Current State of Education**

Please, provide the following information for your university.

**II.1. Quality of the Program’s Curriculum and the Teaching Programs. Provide the information for each Bachelor Degree and Master Degree.**

a) The indicators in this section refer to the Program’s Curriculum. They aim to assess the consistency of the academic program with the requirements of the European higher education.

Share of core (required), Compulsory Specialized subjects, specialized subjects, common and optional subjects, and elective courses included in the Program’s curriculum:

Number in credits is given in national credits. They can be easily transferred to ECTS credits.

**Computer Engineering and Telecommunications Department**

TYPE/AREA	SUBJECT TYPE	NUMBER OF CREDITS
Bachelor, Full-time, Computer engineering and software / Area 1	CORE	65
	Compulsory specialized	5
	Specialized	31
	Common	33
	Optional	10
	Internship or training activities	10
	Final Project and state examination	3
	<b>TOTAL PER TYPE</b>	<b>157</b>
TYPE/AREA	SUBJECT TYPE	NUMBER OF CREDITS
Masters, Full-time, Computer engineering and software / Area 1	CORE	12
	Compulsory Specialized	2

	Specialized	20
	Common	8
	Optional	7
	Internship or training activities	10
	Final Project and state examination	4
	<b>TOTAL PER TYPE</b>	<b>63</b>
<b>TYPE/AREA</b>	<b>SUBJECT TYPE</b>	<b>NUMBER OF CREDITS</b>
Bachelor, Part-time, Computer engineering and software / Area 1	CORE	59
	Compulsory Specialized	5
	Specialized	21
	Common	12
	Internship or training activities	8
	Final Project and state examination	3
	<b>TOTAL PER TYPE</b>	<b>108</b>
<b>TYPE/AREA</b>	<b>SUBJECT TYPE</b>	<b>NUMBER OF CREDITS</b>
Bachelor, Full-time, Radioengineering, electronics and telecommunications / Area 1	CORE	65
	Compulsory Specialized	5
	Specialized	27
	Common	33
	Optional	10
	Internship or training activities	14
	Final Project and state examination	3
	<b>TOTAL PER TYPE</b>	<b>157</b>
Bachelor, Part-time, Radioengineering, electronics and telecommunications / Area 1	CORE	47
	Compulsory Specialized	5
	Specialized	27
	Common	17
	Internship or training activities	12
	Final Project and state examination	3
	<b>TOTAL PER TYPE</b>	<b>111</b>
<b>TYPE/AREA</b>	<b>SUBJECT TYPE</b>	<b>NUMBER OF CREDITS</b>
Bachelor, Full-time, Information Security Systems / Area 1	CORE	64
	Compulsory Specialized	5

	Specialized	27
	Common	33
	Optional	8
	Internship or training activities	18
	Final Project and state examination	3
	<b>TOTAL PER TYPE</b>	<b>158</b>

**Information Systems Department**

<b>TYPE/AREA</b>		<b>AVERAGE NUMBER</b>
Information systems	<p>CORE:</p> <ol style="list-style-type: none"> <li>1. Kazakh (Russian) language</li> <li>2. Foreign language</li> <li>3. Ecology and Sustainable Development</li> <li>4. History of Kazakhstan</li> <li>5. Sociology</li> <li>6. Fundamentals of Law</li> <li>7. Fundamentals of Economical Theory</li> <li>8. Politology</li> <li>9. Philosophy</li> <li>10. Fundamentals of Life Safety</li> </ol>	10
	<p>COMPULSORY SPECIALIZED</p> <ol style="list-style-type: none"> <li>1. Computer Science</li> <li>2. Algebra and Geometry</li> <li>3. Algorithms, data structures and programming</li> <li>4. Math Analysis</li> <li>5. Physics</li> <li>6. Fundamentals of Information Systems</li> <li>7. Probability Theory and Mathematical Statistics</li> <li>8. Professionally-oriented foreign language</li> <li>9. Algorithms and Data Structures</li> <li>10. Professionally-oriented foreign language</li> </ol>	10
	<p>SPECIALIZED</p> <ol style="list-style-type: none"> <li>1. Discrete Mathematics</li> <li>2. Development of applications</li> <li>3. Operating systems</li> <li>4. Application Design Choices</li> <li>5. Databases for IS</li> <li>6. Object-oriented programming</li> <li>7. Architecture and Design</li> <li>8. WEB Technologies</li> <li>9. Database and Client/Server Application</li> <li>10. Human/Computer Interaction and Communication</li> <li>11. Project Management</li> <li>12. Networking and Security</li> <li>13. Data security and protection</li> </ol>	15

	14. Computer Systems 15. Artificial intelligence algorithms	
	COMMON 1. Computer networks architecture 2. Economics and Production 3. Mediative technology	3
	OPTIONAL ()	
	ELECTIVE: 1. Microsoft NET Framework – Application Development in platform .NET 2. Web Component Platform Java EE 5 Development (Oracle, Open source ) 3. Oracle Database 11g development 4. SAP ERP development 5. Parallel and distributed computing 6. Mobile Application Development	6
	OTHER (SPECIFY): 1. English for STEM 2. Educational practice 3. Physical Education 4. Industrial internship 5. Basics of research work	5

*b. Do you collect information on Program's curriculum, teaching programs, learning materials related to similar academic programs at European higher academic institutions (HEIs)?*

**No**

*Please, provide information about the ways to collect such data and give specific examples.*

We are collaborating with USA Carnegie Melon University adapting 12 courses of this university in our education process.

We are not collecting any information from HEIs.

Visiting Poznan Technical University, professor Wesolovsky K. , Dean of Telecommunications Institute

Collaborative work with universities-partners, based on the Agreements, memorandums etc.

Double-degree programs with Tenaga National University, Malaysia

Exchange programs with Pisa University, Italy, Barselona Graduate School, Spain, Inha University, South Korea.

*c. Share of the teaching staff with a doctoral degree/PhD (% of the full-time academic staff providing education at university or Faculty level) (average)*

CET - 56%, IS – 54%

*d. Policy toward usage of modern approaches and methods of teaching*

*Please, give evidence on the usage of modern approaches and methods of teaching. Describe the policy for upgrading academic staff qualification. Mention specific actions taken such as seminars, workshops, training courses, etc. which aim to raise teachers' awareness of contemporary methods in higher education.*

Upgrading and enhancement of academic staff qualification is the important point in the strategic university planning, the issue of constant concern of HR Department and all university faculties and departments. There are different ways and forms of this process as:

- a) Training seminars organized internally at each department on a regular basis.
- b) University methodological seminars, organized twice a month. Speakers and trainers – visiting professors (e.g. University of Bedfordshire, the UK), members of National team of Higher Education Reform Experts, Bologna experts, experienced professors of university etc.
- c) Participation in the international seminars, workshops, training courses.
- d) Participation as the key-note speakers, just participants at numerous international, national, regional and institutional conferences.
- e) Many other ways. (on-line courses, face to face and remote certified courses, research internships etc).

*e. Existence of a Quality Assurance System at National level or International QAS followed. Please explain QAS, if any, to recognize degrees nationwide and follow up system, if any, to reaccredit degrees after being implemented for a given number of years.*

Republic of Kazakhstan has its own national system of Quality Assurance. According to the Law of the Republic of Kazakhstan "On Education» (№ 319-III, July 27, 2007) the state control over the quality of education is provided by the establishment and functioning of the national system of quality assurance. The management of the quality of education is directed to the implementation of a unified state policy in the field of education, and includes public and institutional structures that make up a unified national system for assessing the quality of education. Quality assurance tools are licensing, state attestation, accreditation, university ranking, external evaluation of educational achievements (TDMA), and other mechanisms of direct control and quality assessment. Their use is based on the state documents, regulating the process of external evaluation. Attestation is made by the Ministry of education and science every five years. HEIs are free to choose national or international institutional or specialized accreditation. The accreditation agencies have their own standards and regulations which are used in the process of accreditation.

*f. Share of new courses (subjects) which have been introduced in the Program's curricula for the last 3 years (% of the total number of courses/subjects in the Program's curriculum)*

CET - 10%, IS - 23%

**Over the past 3 years courses such as: "Mobile Application Development", "Cloud computing", "Mediative technology", "Fundamentals of scientific research", "Foreign language for STEM» have been added to the Program's curricula. The SDP line from Carnegie Melon University has been fully updated.**

SDP1 – Computation and Problem Solving
SDP2 – Application Development
SDP3 – Application Design Choices
SDP4 – Performance, Data Structures and Algorithms
SDP5 – Architecture and Design
SDP6 – Databases and Client/Server Applications
SDP7 – Human/Computer Interaction and Communication
SDP8 – Project Management
SDP9 – Networking and Security
SDP11 – Managing Technical People

*g. Usage of contemporary references*



Please, specify the approximate average number per University/Faculty/Department according with the data used at your university, specify which one.

Share of core readings (references) issued over the last five (0-5) years (% of the total number of core readings)	Share of core readings (references) issued over the last ten (0 - 10) years (% of the total number of core readings)	Share of the digital references in e-format (% of the total number of references)
CET - 11 textbooks		20%
IS – 90%		30%

## II.2. ICT facilities and ICT based education

**II.2.a** This section aims to shed light on the usage of ICT-based facilities and teaching methods as well as the digital competencies of the teaching staff.

Computer Engineering and Telecommunications Department (CET)

Indicator	Value
Teaching e-platform accessible online to support general teaching activities	Yes
On-line platform for non-presential education courses	Yes
ICT lab facilities for students and percentage of students that access to them	CET - 100%  IS - 80% RoboTronics, Apple Training Centre, Cloud Computing, SAP Academic Center
Number of software products used for educational purposes	CET - 40 (e.g. MatLab, AutoCad, SkyLab, Oracle, Java, VMWare, Tomcat, VisualStudio, Eclipse)  IS - 15 Math Lab, Math Cad, RAD Studio, Ms Visual Studio Dot.Net 2012, Eclipse, Postgre SQL 7.9, Griffy.com, MS Visio, Android Studio1.3.2, Java JDK, MAC OS, X Code 7.0, MS Office 2010, Oracle PL\SQL 11g, PHP My Admin.
Access to Wi-Fi at the university campus	Yes
Average share of academic hours per course/subject requiring usage of ICT- based teaching methods (i.e. computers and software, multimedia devices)	CET - 30 academic hours  IS - 80%

Average share of academic hours per course/subject held in a computer lab	CET - 25 academic hours IS - 50
Average share of the teaching staff who regularly use ICT-based methods of teaching	CET - 100% IS – 90%
Type of e-learning devices used by teaching staff (i.e. personal computer, smartphones, tablets, etc.)	personal computer, laptop, smartphones, tablets
Devices used by students in classrooms (type of personal devices: i.e. laptop, smartphones, tablets, etc.)	personal computer, laptop, smartphones, tablets
E-learning materials (e-based content) based on e-platform (i.e. Moodle, Sakai, Caroline, etc.)	Moodle  Since 2010, control of current performance, completion of assignments, attendance are fully electronic with internal university portal dl.iitu.kz. Except this there is corporate e-mail – mail.iitu.kz and platonus.iitu.kz, as well as a variety of local resources in the Intranet of the university (teachfiles and doc folders on the file server). Teachers and students have access to the portal from any point of Internet, they can access to all the information resources of the university by a single personal login and password (digital barcode for students, login using letters from name and surname for teachers and staff.. During examination session the exit from the university is restricted.
Web based learning-MOOCs	Under development
Students evaluation methods	Traditional exam, online tests, portfolio, one-minute questions, multiple choice tests etc.

Other non-traditional evaluation methods for transversal competences	No
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### III Digital Framework

1 Is your university following a strategic plan for Digital implementation? YES/NO. Describe it in max 700 words.

Not yet

2. Describe how your university develops its Digital Strategy in terms of Concerns and Key Actions during the last 2 years (i.e. training courses, sessions, workshops, financial assistance offered to academics for qualification upgrading, etc.):

	CONCERNS	KEY ACTIONS
Articulation by faculties, schools and CSUs of plans for technology use	-	-
Student experience and support in ICT use	-	-
Administrative Staff training and support in ICT use to improve the digital competence	-	-
Faculty Staff training and support in ICT use to improve the digital competence	-	-
Library services. Research tools	-	-
Technological support for assessment activities	-	-
MOOCs or online courses	-	-
On-line services addressed to the students (class timetable, exam timetable, courses history, grades, digital library and etc.)	-	-
	-	-

3. Describe the digital methodology used in your Learning Environment, giving examples in different types of subjects related with the type of subjects described in B.1.

You should include a small explanation with the following information:

- Type of ICT methodology used: (i.e. Blended learning, flipped learning, face-to-face learning, gamming learning, partnering learning, etc.)

Blended learning – 40% on-line, 60% face-to face. On-line education is presented by the on-line courses of Carnegie Mellon University programs, special tasks of the teaching staff given by video-lectures, Skype communication etc.

Face-to face learning is traditionally used in all departments and courses.

- **Type of learning:** independent, collaborative (subject and final projects), formally scheduled.

Independent learning is the 30% of curriculum and includes the projects, composition of computer programs. Collaborative – during lab-activities (both online and onsite) where students are requested to collaborate.

- **Feedback:** annual online questionnaires from students and survey of faculty staff

Before having final examinations at the end of each term the students are requested to fill in the special questionnaire evaluating the quality of the course, the teachers' activities and the quality of teaching.

- **Digital facilities:** Online-meetings, seminars, international teleconferences (between universities, social and community activities).

The university practices all types of activities – onpline meetings, videoconferences, webinars. There is also a radio-club for students and staff, own telechannel and studio.

#### **IV. Competitiveness of Education**

*The goal is to assess the competitiveness of your university and the academic program at a national, regional and EU-wide level as well as its conformity with the labor market requirements.*

*1. Do you receive a feedback from students – current and former ones – about the quality of education in the academic programs? Please answer at university level, Faculties or by areas described in Table 1, according with the characteristics and data of your institution giving information about the ways for collecting such information (i.e. questionnaires, surveys; regular meetings with graduates; alumni associations, etc.). Present specific documents, if applicable. Summarize the results.*

Usually at the end of the term each student has to fill in online questionnaires to evaluate the teaching process, quality of facilities, the content of the course, training methods etc. Moreover, each instructor is evaluated at the end of each year at the Contract commission, with the presentation of the report on activities, all results of educational and scientific work during the academic year.

*2. Do you collect information from employers of your students about the quality of education and students' professional qualification and preparation? Please, give information about the ways for collecting such information (i.e. questionnaires, surveys; regular meetings with employers, employers' associations, labor market institutions, etc.). Present specific documents, if applicable. Summarize the results.*

The university also practices "post-graduation support", helping the graduates to find job. There is the Alumni association in the University, which helps to have the permanent contacts with graduates, track their career, get sponsorship, attract alumni to the educational activities of the faculty as reviewers, employers, chairmen of state certification committees. The employers, being the university partners, are invited to contribute to the educational

programs. They are involved into practical training advisory, reviewing graduation papers and lecturers' educational-methodical work; into the State Certification Committees, in arranging "Job Fair" event. They provide the university with the assessment of educational programs, the quality of training.

3. Student and teaching staff mobility per University/Faculty/Area described in table 1

Average number of students per year over the last 2 years who have <u>studied</u> abroad (excluding the EU countries)	18 students, Malaysia, Korea, USA,  58 MA students (exchange program, internship)
Average number of student per year over the last 2 years who have <u>studied</u> in the EU	5students Latvia, Spain  32 MA (internship in different EU universities)
Average number of teachers per year over the last 2 years who have visited foreign academic institutions (excluding the EU countries) for the purposes of delivering lectures/seminars, conducting scientific research, project participation	10 teachers Korea, USA, Malaysia
Average number of teachers per year over the last 2 years who have visited academic institutions in the EU for the purposes of delivering lectures/seminars, conducting scientific research, project participation.	13 teachers Latvia, Spain, Slovenia, Italy, Poland

4. **Employability of graduates.** (Please give answers by University/Faculty/Areas described in Table 1)

The next two indicators estimate the degree of qualification mismatch for your graduates. Please, provide data on:

- Share of graduates (% of the average total number of graduates per year) who over the last 5 years have started a job which require professional qualification and theoretical knowledge in the field of Engineering and Engineering Trade. These are students who work in accordance with their field of study/specialty (this indicator is related to the extent of horizontal qualification mismatch).

Computer Systems and Software Engineering – 61%

Radioengineering – 72%

- Share of graduates (% of the average total number of graduates per year) who over the last 5 years have taken working positions which require the same educational degree (i.e. bachelor or master) as that they possess. These are

students who work in accordance with the educational degree acquired (this indicator is related to the extent of vertical qualification mismatch).

CET – 52%, IS – 48%

Please, provide an analysis of the results and discuss the reasons in case of low shares)

International Information Technology University was established in 2009 and the first graduates were in 2013.

No	Year, Spacialty	Total number of graduated students	Employed according to the specialties	%
1.	<b>2013</b>			
	5B070300/6M070300 – Information Systems	156	152	97%
	5B070400/6M070400 – Computer Systems and Software Engineering	145	142	98%
	5B071900 - Radioengineering	27	25	98%
2.	<b>2014</b>			
	5B070300/6M070300 – Information Systems	146	113	77%
	5B070400/6M070400 – Computer Systems and Software Engineering	126	109	86,5%
	5B071900 – Radioengineering	28	27	96,4%
3.	<b>2015</b>			
	5B070300/6M070300 – Information Systems	132	97	73%
	5B070400/6M070400 – Computer Systems and Software Engineering	106	75	70,7%
	5B071900 – Radioengineering	63	37	58,7%

## 5. Education and training provided in a real-life working environment

5.1. Per areas described in table 1, please share the courses/subjects typo for which part or all classes are conducted in a real-life working environment (i.e. companies, banks, factories, etc.)

Mandatory 3-month internship is foreseen for the following bachelor academic programs (for all part-time and full-time students):

- Computer engineering and software
- Information Security Systems
- Radioengineering, electronics and telecommunications

Mandatory 2-month internship is foreseen for the following master academic programs:

- Computer engineering and software
- Information Security Systems

*5.2. The average number of academic hours per course/subject conducted in a real-life environment*

150 hours (10 credits \* 15 hours)

*5.3. Additional evidence on the practical orientation of the study and the practical training of students (i.e. internships during study, etc.).*

University have agreements on internship with a number of companies. Students should fulfill an internship diary during internship. After internship students should provide and defend detailed report. Most of the final projects' titles are provided by companies.

**6. University – Business links**

*Please, provide information on participation of specialists, experts, entrepreneurs, etc. in the educational process and/or curricula development, if any. Specify the average share of lectures/seminars delivered by them (% of total academic hours per course/subject.)*

For each course the university invites foreign specialists. For 2015 – 2016 academic year:

- 1 year contract – 6 professors,
- Module contract – 3 professors,
- Visiting professors – 5 professors.

According to the Agreements with ICT companies, where the students have internship, the representatives of them are the experts of educational programs and curricula.

Total number of courses, partly delivered by representatives of companies – 12% (Kazakhtelecom, JS company NIT etc)

**7. Does your university study the current tendencies and requirements of the labor market?**

*(Please, provide specific information about the ways to collect labor market data. Describe records, databases, analysis you prepare, if any.)*

The information is taken from the participation in the Board of Directors' meetings of several partner-companies. The university has the access to the data of the Ministry of Industry and New Technology, can use the data of the Ministry of Education and Science, has close links with telecom companies and use their information and analyses of labor market, makes its own investigations on labor market demands in specialists.

**8. Does your university/faculty offer or plan to offer joint degree programs with partner universities?**

*(Please, provide general information about joint degree programs per area described in 1 with other universities in your home country or abroad, if any.)*

Double –degree program with Tenaga National University, Malaysia

Plans - to have double-degree program with Moscow Technical University of Communications and Informatics.

**9. Please, discuss the Lifelong Learning (LLL) policy of your institution.**

In Kazakhstan there are no age limits for Higher Education. It has different forms – full-time, part-time, e-learning.

10. Future teaching methodologies and their implementation

*Thinking about future students, current learning strategies followed by many of them before entering university, and ICT technologies:*

*Which key competences, skills and practices do you think that will be needed at university level to enhance students learning experience? Explain briefly under faculty staff, student and stakeholders' point of view.*

International Information Technology University is the leading university in the country in ICT achievements, it is the winner of many international and national contests, forums etc (National Economic Forum, Forum ASTEX, is in the top 20 of World universities – winners of ACM ICPC, winner in international ABUROBOCON etc). Each year it presents about 20-40 projects for the national and regional economy. However, it uses and plans to use the most modern and progressive approaches and methods to achieve the relevant results.

The teaching staff of the departments outlined some Generic and Subject Specific competences in the field of Engineering to enhance students' learning practice. For example:

Generic	Subject Specific
<ol style="list-style-type: none"><li>1. Knowledge and understanding of the most important facts, concepts, theories and principles of the engineering disciplines and natural sciences supporting them and mathematics;</li><li>2. Ability to generalize and use scientific achievements in the solution of branch tasks.</li><li>3. Ability to modeling and design.</li><li>4. Ability to use IT.</li><li>5. Ability to apply knowledge into practice.</li></ol>	<ol style="list-style-type: none"><li>1. Ability to carry out engineering, technical and economic calculations.</li><li>2. Ability to spatial thinking</li><li>3. Ability to solve practical engineering problems.</li><li>4. Ability to expect ecological consequences of projects and technological processes.</li><li>5. Ability to formulate and solve scientific problems, to conduct researches to receive new scientific and practical results.</li></ol>

The stakeholders, taking an active part in the educational process of the university, present their analyses and proposals for future development of the university.