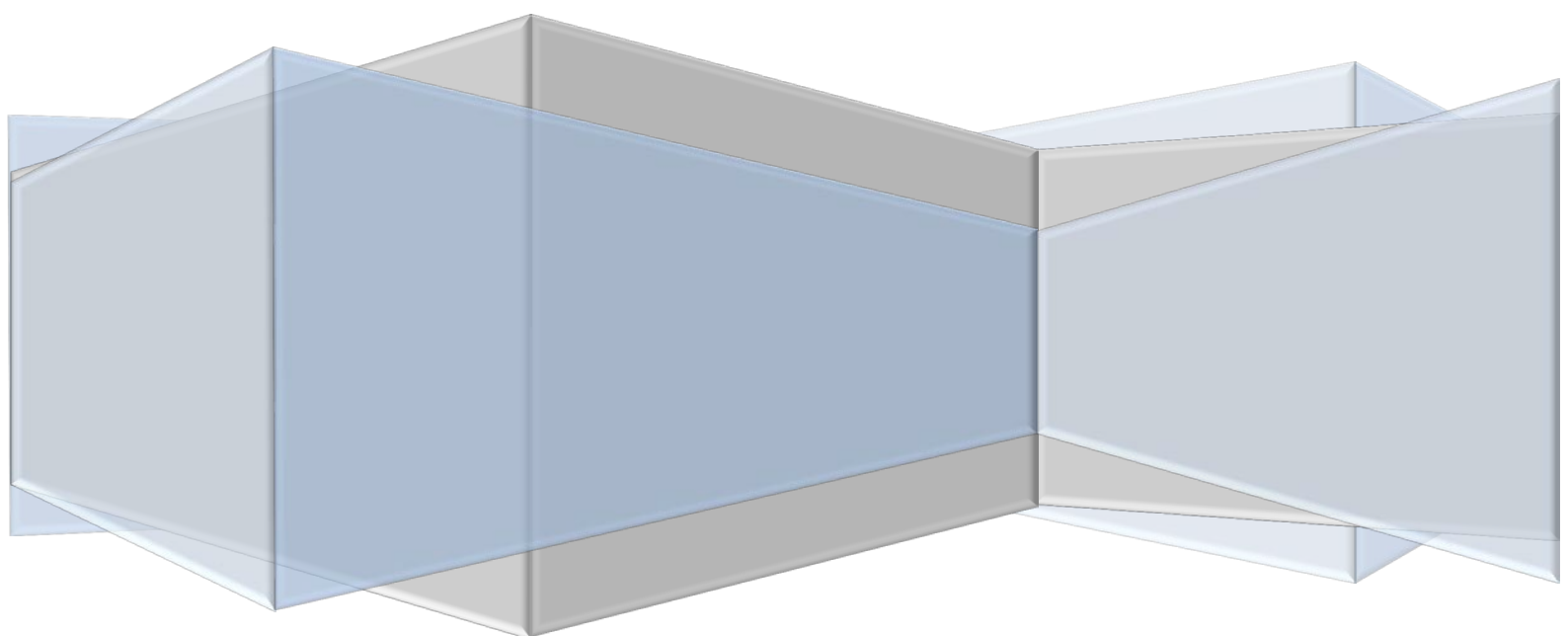




# ECCUM

## Project Description



## CONSORTIUM ROLES

### USC

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The Coordinator

- Runs the overall management of the project based on the guidelines of ERASMUS+, taking into account any additional rules set by the Steering Committee (SC).
- Manages the administrative, legal and financial matters of the project. USC will take all the necessary steps to ensure the project implementation in accordance with the plan.
- Provides overall project management, chairs annual SC meetings and quarterly to review the project progress on the basis of project coordinators' reports.
- Performs the inner expertise of the developed Master Programme.
- Monitors the English language training program implementation in CA universities, holds final English proficiency assessment of the CA English learners.
- Together with UP trains the CA academic staff to improve the pedagogical capacity of academic staff in teaching the students and using the software tools.

USC has two voices:

- **Academic coordinator:** Prof. Óscar López Pouso
- **Management coordinator:** Enrique López Veloso

### POLITO

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The action of the Department of Mathematical Sciences (DISMA) of POLITO within this project will focus on the following guidelines

- Analysis of the content of international educational Master programs in Mathematical Engineering
- Supervise the monitoring of the development of the educational objectives and elaboration of the curriculum
- Training of the academic staff of the partner Universities in CA with the aim of improving the use of new technologies and software tools in the educational process
- Supporting with the recommendations in developing the course materials

### UP

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The University of Primorska leads

- Training on Bologna process of curriculum development
- Gives consultation on development of the courses, together with USC trains the CA academic staff to improve their pedagogical capacity in teaching the students and using the software tools

- Defines the quality of the project implementation with special reference to the Bologna principles.
- Construct the web site of the project.
- Will be responsible for coordinating the Computing Centers activities, management of Web Pages.

## **CA PARTNERS**

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**URSU together with other CA** partners equally does:

- Establishing, maintaining, monitoring computing centers and platform
- Carrying out industries' survey, their needs assessment
- Developing and implementation of master curriculum, its modules
- Video lecturing for CA universities
- Disseminating the project
- Transferring good practices on developing interdisciplinary master programme to other faculties of partner HEIS
- Developing the professional networks

## **URSU**

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As the CA regional coordinator, UrSU participates in overall project management.

UrSU selects project teams and distributes the responsibilities within the partner universities.

UrSU performs:

- Overall monitoring of the dissemination activities in UZ and KZ, supervision of the curriculum
- courses development in UZ
- Leading mathematical engineering network of industry and ca partner HEIS
- Monitoring and regular communication within EU and ca partners

## **TTPU**

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As in TTPU training is in English, TTPU works out the plan on the English course for the academic staff of CA partners.

- TTPU&IITU create the shared platform for the established Computing Centers in CA and professional network for Master program with TTPU, BETI and KSU.
- Using the available premises, TTPU can organize workshops for staff and students of partner HEIs elaborate the guidance on students' projects.
- TTPU can organize continuous training for UZ industry to run after project lifetime.

## **BETI**

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BETI with TTPU and KSU is responsible for creating the professional network for Master program.

For Master students BETI assesses to conduct student internships at GM Powertrain.

## **KSU**

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KSU is the regional coordinator in Kazakhstan. KSU:

- Will take part in developing curriculum and course materials, supervise monitoring and managing in KZ partners and create professional network for the developed Master program, establishing computing centre and its management.
- Will also organize and manage the dissemination events and surveys for the improvement of the project in KZ.
- During the implementation of the project, KSU will organize students' internships in enterprises and stakeholders.
- Will be responsible for organizing the quarterly meetings, arranging information and formal communications together with ursu.

## **IITU**

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IITU

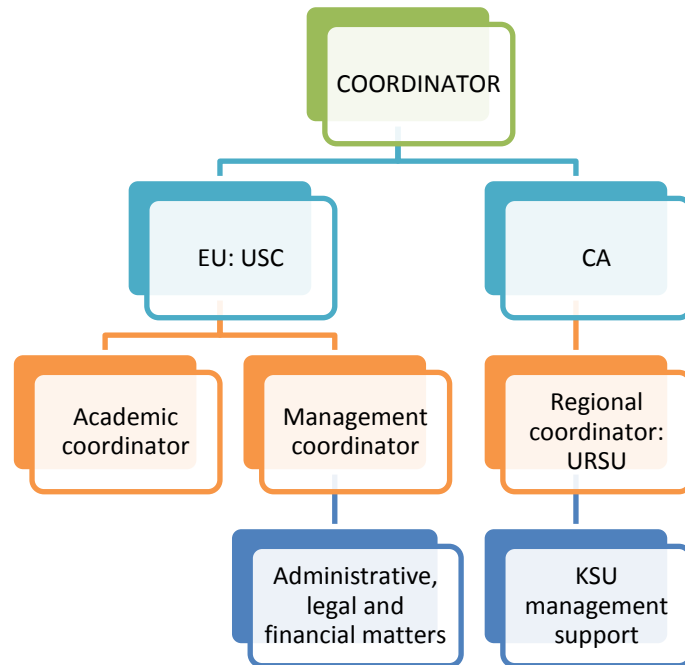
- Will take part in developing curriculum and course materials, establishing computing center and its management.
  - Is also responsible for creating the common platform for established computing centers in Kazakhstan.
  - Will locally arrange both dissemination events, surveys for the improvement of the project and student internships. These internships will be helpful in the applications of theoretical knowledge in enterprises and stakeholders.
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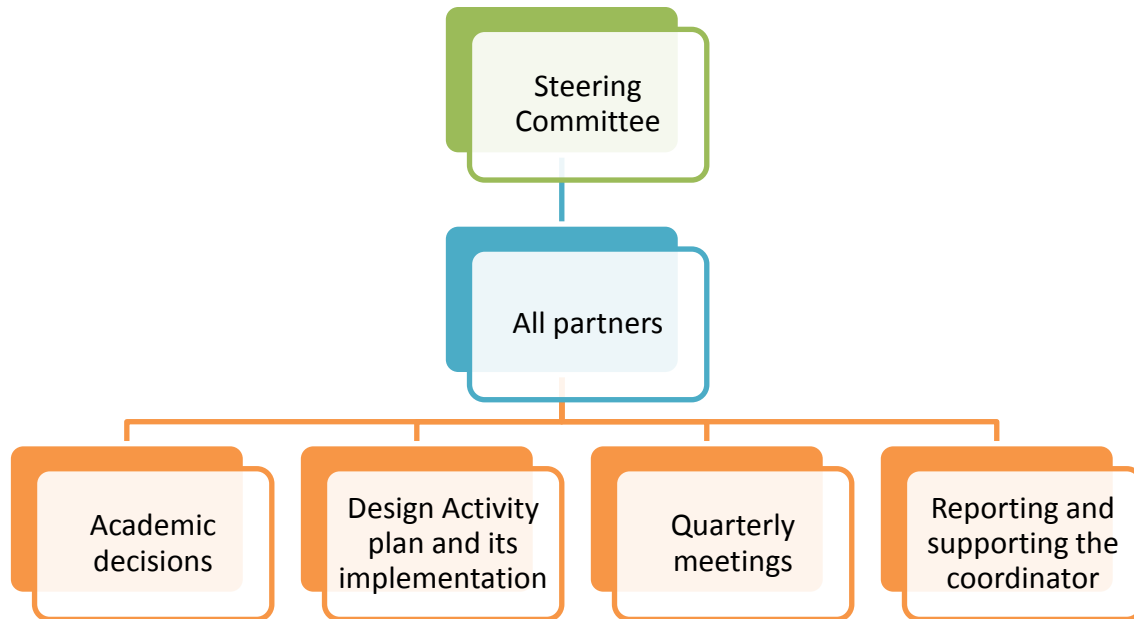
## ASSOCIATED PARTNERS

<i>Ref.n r</i>	<i>Name of organisation</i>	<i>Type of institution</i>	<i>City</i>	<i>Country</i>	<i>Role in the project</i>
P9	Fundacion Centro Tecnologico de Supercomputacion de Galicia	Foundation	Santiago	Spain	Give instructions and recommendations for establishment of Computing Centres; Helps to sustainability of the program;
P10	Ministry for Higher and Secondary Specialized Education of the Republic of Uzbekistan	National Authority	Tashkent	Uzbekistan	Help to develop the syllabuses and accreditation the Curriculum; Support in dissemination and sustainability activities in Uzbekistan; Signing agreement/contracts with HEI
P11	Ministry of Education and Science of the Republic of Kazakhstan	National Authority	Astana	Kazakhstan	Evaluation of the program – via licencing Support in dissemination and sustainability activities in Kazakhstan; Signing agreement/contracts with HEI;
P12	Physical-Technical Institute	Research Institute, Public	Tashkent	Uzbekistan	Participate in survey in order to analyse the interdisciplinary program; Signing agreement/contracts with HEI; Support with the student internships;
P13	The Institute of Information and Computing Technologies-Kazakhstan	Research Institute, Public	Almaty	Uzbekistan	Participate in survey in order to analyse the interdisciplinary program; Signing agreement/contracts with HEI; Support with the student internships;
P14	JSC "General Motors Powertrain-Uzbekistan"	Enterprise	Tashkent	Uzbekistan	Participate in survey in order to analyse the interdisciplinary program; Signing agreement/contracts with HEI; Support with the student internships;
P15	JSC "National Information Technologies", NITEC	JSC, state Enterprise	Kostanay	Kazakhstan	Support in the needs analysis survey Participate in survey in order to analyse the interdisciplinary program; Signing agreement/contracts with HEI; Support with the student internships; promotion of the master program
P16	Limited Liability Partnership "Digital"-Kazakhstan	Private company, Enterprise	Kostanay	Kazakhstan	Support in the needs analysis survey, Evaluation of program, Supports for the dissemination of the project result
P17		NGO	Urgench	Uzbekistan	Promotiing of the project results among entrepreneurs, developing collaboration

	KRASS - Khorezm Rural Advisory Support Service				with the industry, provision for new partnership between university and industry
P18	Association of legal entities in the form of association(union) "Association for Promotion of Entrepreneurial Activity in Kostanay region "	Association of legal entities	Kostanay	Kazakhstan	Promoting of the project results among entrepreneurs, developing collaboration with the industry, provision for new partnership between university and industry

**PROJECT MANAGEMENT**





University	Person proposed for Steering Committee
1-USC	Oscar López Pouso
2-POLITO	Stefano Berrone
3-UP	Ales Oven
4-URSU	Gayrat Urazboev (URSU)
5-TTPU	
6-BMTI	
7-KSU	Yelena Kandalina (KSU)
8-IITU	

### Cooperation and communication arrangements of the consortium

- **Email list**
- **CV of project's team**
- **Academic coordinator** in each Local Project Team
- **SC:** responsible for communication, overseeing the project activities and tasks, reporting on the project implementation internally at home university and externally to USC.

### The main responsibility of SC is

- To facilitate cooperation mechanisms among the partners
- To undertake the academic, administrative and financial management
- To contribute to quality assurance through the management organisation (the internal quality assessment; feedback on project events, evaluation and follow up).

As for decision making procedures, urgent decisions to be made are suggested by any member of SC or USC and should be approved by the SC with simple majority of the votes.

Any suggestions on the project are to be primarily considered by USC, UrSU, KSU, their involvement is compulsory, it is their responsibility to explain the issue to EU, UZ and KZ partners.

Decision may be taken as per email communication, via e-voting or skype/video conference.

No response in a requested period of time will be considered as an agreement.

It is the obligation of SC member to agree/consult on the decision with home university.

## **AIMS and OBJECTIFS**

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The aim of the project is to strengthen academic capacity of experts on mathematical engineering in Central Asia via development and implementation of interdisciplinary Master program “Mathematical Engineering” through collaboration with all stakeholders for enhancing the scientific potential on Mathematical engineering and professional development of in-service specialists.

Joint activities between HEI of CA and EU include:

- Joint evaluation of teaching materials
- Video-conferences on academic issues;
- Research-related activities, such as joint research projects, publications

These activities will go beyond the project and be supported by bilateral agreements between CA HEIs and EU institutions.

The **industry** will be closely involved at different stages of the program development:

- Developing the program needs survey analysis will be perform to meet the requirements of the labor market
- Qualification frameworks will be elaborated and presented to the industry, on the basis of their feedback, it will be improved, curriculum elaborated and syllabuses developed.
- The evaluation of the developed program will be done by industry with special concern on the topics for the industry to teach students, and to perform joint (industry and HEIS) research
- Industry will be involved in the evaluation of the students, having their internship within it.

## **ACTIVITY PLAN**

- **Development of interdisciplinary master program** in Mathematical Engineering by **September 2016** on the basis of EU approach and best practices of EU universities
- Establishment of 5 Computing Centers in each Central Asian partner university and development of the shared platform between partners **by November 2016**.



The set of the documents on the developed master program will include:

- Description of the program,
- Qualification framework for mathematical engineering;
- Curriculum;
- Syllabuses of the disciplines.

USC and UP will provide external expertise of the program and it is supposed to evaluate the program by an EU expert.

The CA universities have to prepare the documents for the **approval of the program by UZ and KZ Ministries of Education**, which is to be performed in **2016**.

5 Computing Centers will be established to provide for material base of the master program, as software plays important role for the content of the developed program; besides educational purposes, the software will be used for joint research of industry and HEIS.

The results will be published at the platform developed by UP by the end of 2016. This platform will contain the database of CA scholars and thus stimulate collaboration in the field and exchange of best practices; beside teaching materials, including video lectures will be stored and shared on the platform.

#### **QUALITY CONTROL and MONITORING**

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Quality assurance and monitoring envisage activities grouped in the separate working package 7.

These activities include a number of evaluation measures and monitoring mechanisms, including self-assessment, external assessment, expertise, internal and external supervision, surveys of students, university staff and industries, and peer reviews.

#### **The project's Steering Committee will take a leading role in these activities**

POLITO will supervise and monitor the procedure of the development of the curriculum and the courses.

SC will take part in overall monitoring and management discussions in annually and quarterly meetings.

SC will discuss, amend and validate the following items:

- Reports on the meetings with the stakeholders, including needs analysis survey, monthly monitoring of the usage of the web page on the Master program after the first project year
- Quarterly financial and monitoring reports prepared by the project coordinators at the partner HEIS;
- Monitoring on development of Database on the academic staff of partner HEIS involved in the Master Program;

**Annual meetings** of Steering Committee will focus on revision of the project progress on the basis of project coordinators' reports.

After each SC meeting USC, UrSU and KSU (in turn) writes a mission report to be sent to the industry partners, to the EACEA and it will be published on each partner's website.

A **final report** is composed by USC on the basis of each partner report, along with proposed changes for the project's future direction and proposals for financial and institutional sustainability.

The **quality of training sessions** is to be assessed by the participants; the results of assessments will be discussed by the SC to propose actions for improvement.

**The quality of the developed master program will be assessed internally by:**

- Partners (at the level of syllabuses –via peer revision, and by URSU as a regional coordinator; and approved by SC)
- POLITO (ensure proper qualification frameworks, correct ECTS usage, relevance of the content)
- UZ/KZ Ministry of Education accordingly (via licencing the developed program)
- Industries (to ensure the proposed content meets the needs of labour market)

#### **DISSEMINATION and EXPLOITATION STRATEGY**

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The ECCUM shared **web platform** will become the tool for improving education in mathematics via sharing teaching materials; it will provide information about the master program, links to partner organisations, project-related initiatives and online resources; the database of scholars will provide the dissemination in the professional field of mathematicians.

Outcomes of the project, its initiatives will be publicised in local newspapers, scientific journals, professional reviews, and major education-related websites of the partner countries.

Teaching 30% of the curriculum in English will attract as the best practice in the field other HEIs, as it is the urgent issue in education in UZ and KZ. Quarterly, some dissemination activity is to be carried out by each partner HEIs.

The first step will be to provide information about the project at each partner website.

Each partner develops the dissemination action plan and reports to the steering committee. UrSU and KSU should monitor dissemination, collect the evidence (publications, links on websites, pictures, and reports on the events) and submit it to USC quarterly.

The Master Program project results will be disseminated via students and publications on best practices of developing the program.

Work of Computing Centers wide involved in the industry, provides dissemination of the project.

At the end of the project, representatives from government, media and professional organizations will be invited to a one-day seminar to discuss dissemination results and ways to sustain the outcomes of the project.

## **SUSTAINABILITY**

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Academic sustainability is ensured through participation of Ministries of Higher Education of CA partners.

The organizational sustainability is provided by the CA partner universities with their Computer Centers and Master courses.

Financial sustainability will also be achieved, thanks to the purchase of the academic material, equipment, software, etc.

The trained academic and technical staff will sustain as they will keep trainings to their followers.

All HEIs rectors and the UZ/KZ ministries of education are in favour of developing the program. The program will be licensed by the KZ ministry of education and accredited by UZ ministry of education by September 2016, and new masters programmes will be accredited following the graduation of the first cohort of masters students (2018), assuring the academic sustainability of the new curriculum.

The project's objectives are in line with the UZ/ KZ development strategies and regional strategies for economic and industrial growth. Involvement of industry in educational process will give relevance of the master program into the labor market.

The Computing Centers ensure project sustainability by offering eLearning and shared web platform. This will lead Computing Centers to become self-financing through tuition and expertise fees.

## WORK PACKAGES

<b>WP.1</b>	
1.1	Mobility to Europe
1.2	Training on the Bologna process
1.3	Survey on stakeholders
1.4	Analysis of the content of international educational programs
<b>WP.2</b>	
2.1	Elaboration of qualification frameworks and Development of the curriculum for the Master Program;
2.2	Approval of the developed curriculum;
2.3	Development of the course materials of the curriculum
<b>WP.3</b>	
3.1	Establishment of Computing Centers, purchasing of the hardware and software packages
3.2	Development of the common platform among Computing Centers established by the project
3.3	Maintain the created platform
<b>WP.4</b>	
4.1	Developing of the English language training program and improving the English proficiency of academic staff based on it
4.2	Enhancing the capacity of the teachers on using the engineering software tools
4.3	Retraining of the academic staff
<b>WP.5</b>	
5.1	Accreditation of the Master Program
5.2	Introduction of the Master program to other Institutions
5.3	Promoting by local mass media
5.4	Organizing Info days
5.5	Web site construction of the Master program and Computing Centers
5.6	Signing agreements/contracts between the universities and enterprises
5.7	Transfer of good practice and share expertise to other institutions
<b>WP.6</b>	
6.1	Student enrollment procedure
6.2	Delivering of video lectures on the topic "Introduction to Mathematical Engineering"
6.3	Development of professional network
6.4	Organizing student Internships;

**WP.7**

- 7.1 Quality control and monitoring on developed Master Program
- 7.2 Evaluation of the master program by external experts
- 7.3 Reporting;

**WP.8**

- 8.2 Defining local coordinators and project team.
- 8.3 Arranging information, formal communications and quarterly meetings
- 8.4 Supervising the development of the curriculum and monitoring it.
- 8.5 Coordinating the Computing Centers activities and program WEB pages