



Capacity Building in the Field of Higher Education  
ERASMUS+ 2015

# Development of two cycle innovative curricula in microelectronic engineering (DOC MEN)

## Project overview

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Cracow University  
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Erasmus+ Programme  
of the European Union



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Technische  
Universität  
Berlin



ENGINEERING CONSULTING AND MANAGEMENT  
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## DOC MEN facts

### Theme for cooperation

Modernisation of curriculum by developing and innovative courses and methodologies using ECTS, the three cycle system and the recognition of degrees.

Project duration: 3 years

Budget size (Tempus Grant)

997.166,- EUR

### Selection results of call EAC/A04/2014

- 937 applications received,
- 171 (18,2%) proposals recommended for funding

### Target countries / priorities

This application addresses priorities in curricula reform: Armenia, Israel, Kazakhstan - engineering/engineering trades

### Project type:

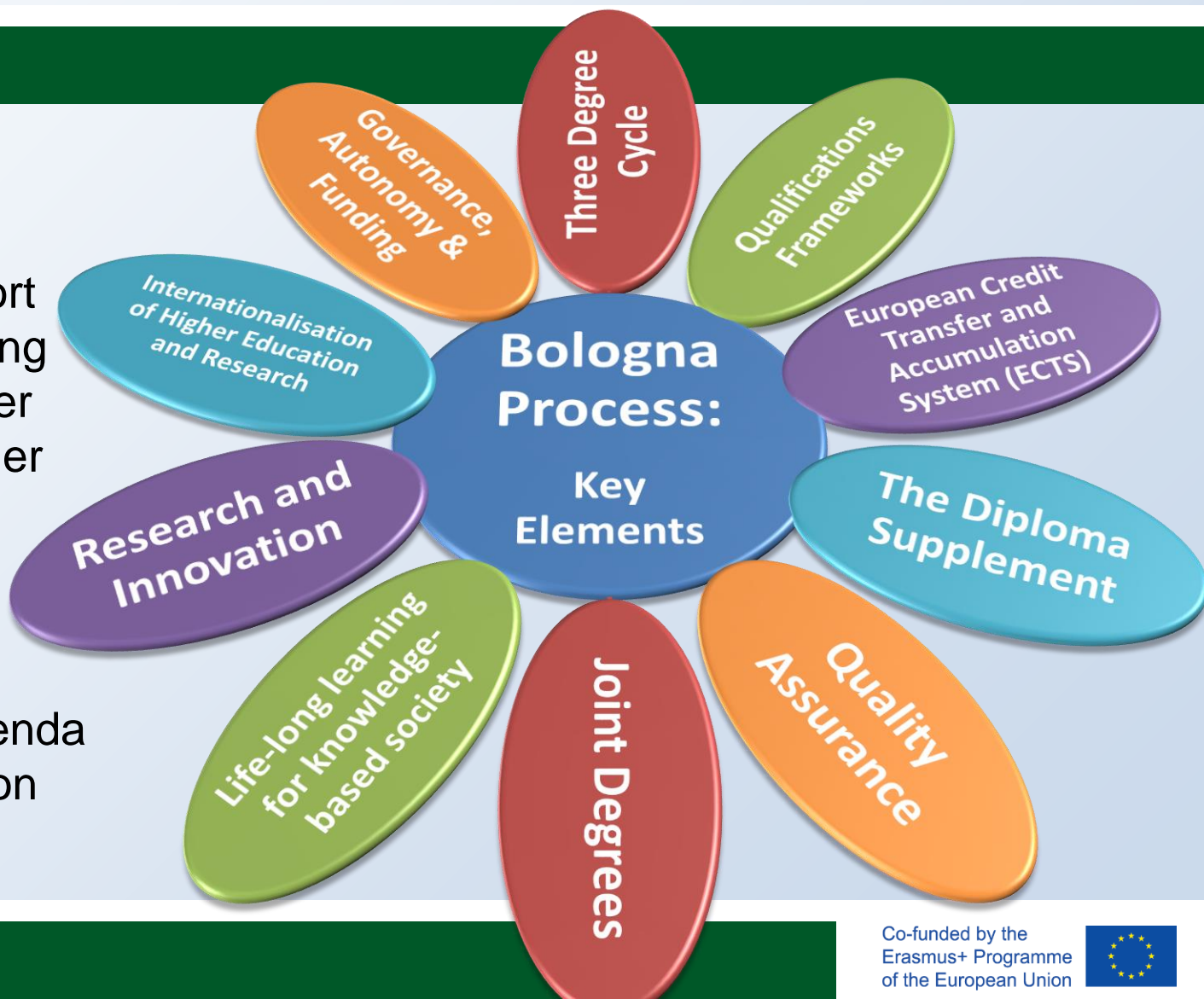
Joint project, cross-regional

Consortium size: 17 organisations



## Bologna Process

This project is designed to support the capacity building in the field of higher education in Partner Countries with regard to the Bologna process and European modernisation agenda for higher education



## Main goals

### 3 Transferable curricula/modules

- ✓ Effective communication with groups, presentation techniques
- ✓ Survival in Labor Market (carrier managing)
- ✓ Project management (business planning, funding, marketing, performance)

### 11 core curricula/modules

- ✓ ULSI devices and novel simulation techniques,
- ✓ ECAD for Microsystems,
- ✓ Bio-Nanoelectronic devices for biosensing,
- ✓ Nano/Microelectronic interfaces for brain studies,
- ✓ Design of nanoscale integrated circuits,
- ✓ Nanomaterials
- ✓ Packaging technologies in microelectronics,
- ✓ “Microelectronic technologies for alternative sources of energy”,
- ✓ Technologies and applications of Superconductive materials
- ✓ Practise oriented curricula for micro electronics and data transmission
- ✓ Innovative solving in microelectronics engineering problems, using TRIZ method.

### updated current curricula in the target field

#### New supporting learning environment

- ✓ Joint web based platform
- ✓ Microelectronics Labs (MicLabs)

#### Linking to the labor market

- ✓ Establishing Microelectronics Service Office (MicSO) with stakeholders support



## List of partners

### EU partners

Cracow University of Technology	<a href="http://www.pk.edu.pl">www.pk.edu.pl</a>	Poland	Cracow
Technische Universität Berlin	<a href="http://www.tu-berlin.de">www.tu-berlin.de</a>	Germany	Berlin
Technical University of Sofia	<a href="http://www.tu-sofia.bg">www.tu-sofia.bg</a>	Bulgaria	Sofia
Politecnico di Torino	<a href="http://www.polito.it">www.polito.it</a>	Italy	Turin
ECM Space Technology GmbH	<a href="http://www.ecm-space.de">www.ecm-space.de</a>	Germany	Berlin

### Partner countries / target universities

L.N. Gumilyov Eurasian National University	<a href="http://www.enu.kz">www.enu.kz</a>	Kazakhstan	Astana
Caspian Public University	<a href="http://www.cu.edu.kz">www.cu.edu.kz</a>	Kazakhstan	Almaty
Shakarim State University of Semey	<a href="http://www.semgu.kz">www.semgu.kz</a>	Kazakhstan	Semey
North Kazakhstan State University	<a href="http://www.nkzu.kz">www.nkzu.kz</a>	Kazakhstan	Petropavlovsk
Yerevan State University	<a href="http://www.ysu.am">www.ysu.am</a>	Armenia	Yerevan





## List of partners

### Partner countries/target universities

National Polytechnic University of Armenia	<a href="http://polytech.am">polytech.am</a>	Armenia	Yerevan
European Regional Educational Academy Foundation	<a href="http://www.era.am">www.era.am</a>	Armenia	Yerevan
Gavar State University	<a href="http://www.gsu.am">www.gsu.am</a>	Armenia	Gavar
Tel Aviv University	<a href="http://www.tau.ac.il">www.tau.ac.il</a>	Israel	Tel Aviv
Bar-Ilan University	<a href="http://www.biu.ac.il">www.biu.ac.il</a>	Israel	Ramat Gan
Sami Shamoon College of Engineering	<a href="http://www.sce.ac.il">www.sce.ac.il</a>	Israel	Beer-Sheva
Holon Institute of Technology	<a href="http://www.hit.ac.il">www.hit.ac.il</a>	Israel	Holon

### Associated partners

Kazcosmos/National Center of Space Research and Technology	<a href="http://kazcosmos.gov.kz">kazcosmos.gov.kz</a>	Kazakhstan	Astana
Ray Techniques Ltd	<a href="http://www.nanodiamond.co.il">www.nanodiamond.co.il</a>	Israel	Givat Ram







## Work plan overview

### Project Year 1 (Start Phase)

1. **Review, analyse, upgrade** current curricula/programmes in microelectronics inclusive ECTS
2. **Develop teaching materials** for 11 new core curricula, 3 transferable modules and on this base a set of curricula and modules.  
Develop new practice oriented supporting infrastructure (MicLabs)
3. **Begin to develop, publish and purchase** a manual, handbooks and syllabi.  
Joint web based platform
4. **Prepare a set of documentation** for MicLabs and MicSO





## Work plan overview

### Project Year 2 (Working out Phase)

1. **Purchase/install equipment** for MicLabs and MicSO
2. **Accredit** a set of curricula and modules on institutional level
3. **Training courses in EU:** Retrain academic teachers in new curricula, methodology. Tentatively: 3 retraining courses in new curricula/modules
4. **Retrain courses** in partner countries for non academic mentors, who will be able to supervise student's practice in their enterprises
5. **Staff training** for MicSO offices will take place in TUB, prepared and carried out by ECM







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## Work plan overview

### Project Year 3 (Final Phase)

- 1. Master Classes:** Minimum 16 Master Classes on operation of new labs will be prepared and delivered in target universities.  
Complete establishing MicSO with stakeholders support
- 2. Pilot teaching /operation:** Teaching students in new curricula/modules.  
Approximately 25 students from each target university will be involved in the courses offering new curricula/modules
- 3. Accredit** a set of curricula and modules on national level
- 4. Pilot operation** of MicSO involving universities and stakeholders outside the project. This activity targets to ensure the sustainable operation.





## Work plan overview

### Disseminations & Sustainable Activities

From the first till the last day of project life are planned activities on dissemination of information and ensuring of sustainability of project outcomes. Each target university will work out timetables for publications, information and sustainability ensuring events based on project activities especially by MicSO.

It is planned to invite representatives from stakeholders and universities outside the consortium to promote and disseminate the project outcomes.

To involve new participants into the project activities there will be developed the "DOC MEN Plus" agreement.

- Conferences & workshops
- Project web portal
- Involving stakeholders
- Finding and attracting sponsors
- Commercialization of results





## Work plan overview

### Project Quality Control

Project Quality control will be implemented on the basis of the target university's quality assurance systems.

**Internal/external evaluation:** In order to set up effective quality control mechanism, the Internal Evaluation Board (IEB) will be appointed. The list of activities will include: comparison with timetable of the project activities in the work plan. Self-evaluation of outcomes and their quality in form of questionnaire / interview reports received from target students /academics/ stakeholders, and graduates groups.

Local coordinators from target universities have to provide IEB every 6 months with self-evaluation reports of the work plan progress.

External evaluation will be carried out by DAAD, ENO of partner countries and individual project's expert.





## Work plan overview

### Project Management

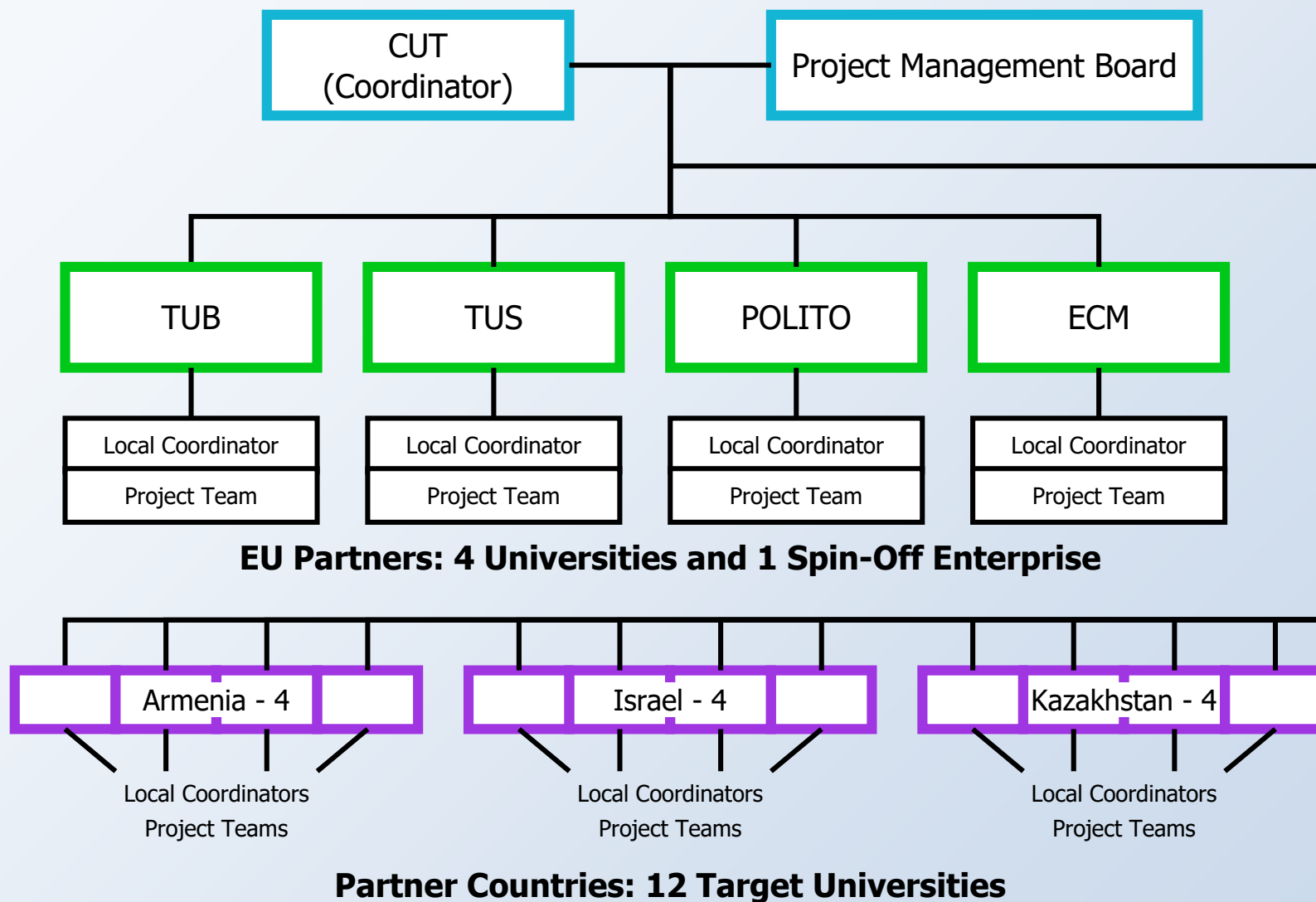
A **Project Management Board (PMB)** – Project Council - will be formed as a strategic decision-making body inclusive one representative from each consortium member who at the same time will operate as local coordinators in their institutions. The local coordinator will lead the special formed Local Project Team (LPT) of his institution.

**Coordination meetings:** International, regional and local/hosting coordination meetings.

**Daily project administration and coordination:** project management, administration and coordination will be carried out by the coordinator (CUT) and project manager (ECM) with LPT from target universities.



# Management structure and decision making process (PMB established)





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Good bye !

THANK YOU FOR YOUR ATTENTION!

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