



HUTON
Human-TOol Network



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See details HUTON admission has been started

European Commission
TEMPUS

**Assisting humans with special needs:
Curriculum for HUmAn-TOol interaction Network**

Dejan Popović: **Overview of the project status**

HUTON plan (from the proposal):

- The project HUTON will result with the accredited MS program that is appropriate for the educational system at the universities of Belgrade, Novi Sad and State University of Novi Pazar.
- Since the potential candidates for this program come from various schools (medical, engineering) which have two types of bachelor programs the plan is to develop two streams: medical and engineering, and to allow students who are coming from the 3+2 and 4+1 educational schemes to enter the program.
- The continuation of the education is viewed at the doctoral schools (e.g., University of Belgrade, Biomedical Engineering and Technologies).
- The program therefore will have two options:
 - 60 ECTS for students coming from the 4+1 schema
 - 120 ECTS for students coming from 3+2 schema. In this program the first 60 ECTS will be arranged from the existing courses that are already accredited.



The HUTON addressed the development of 60 ECTS program

- The courses developed for the HUTON are developed so that they have two options: Option for non specialists (engineering for medical background, life sciences for engineers).
- Option for specialists (engineering for engineers, life sciences for medical background candidates).
- Laboratories development



Plan of activities during for the HUTON project:

- WP1. Development and maintenance of the network and forming of the core of experts for the delivery of the curriculum leading to the specialist degree
- WP2. Design of new courses and restructuring of existing courses with the supporting teaching materials
- WP3. Development of the Laboratory facilities for the new curriculum
- WP4. Implementation of the new curriculum
- WP5. Quality control
- WP6. Dissemination
- WP7. Sustainability
- WP8. Management





Development of curriculum (ECTS and degree recognition) in the domain of interdisciplinary and multidisciplinary studies.

This curriculum leads to a master degree in the modern technology used for improved care of humans with special needs.

The HUTON project created an accredited program that attracts professionals to improve their skills and in parallel provide the background for the effective implementation of the new knowledge.

The foreseen direct beneficiaries are the clinical partners in HUTON, but the curriculum will be open to the whole RS medical sector.



HUTON project / Development of the curriculum: Mechatronics for Medical Rehabilitation

1. University of Belgrade (coordinator)



2. University of Novi Sad



3. State University of Novi Pazar



4. University of Patras, Greece



5. University of Genoa, Italy



6. University of Ljubljana, Slovenia



7. Clinic for rehabilitation "Dr Miroslav Zotović", Belgrade



8. Child and Youth Health Care Institute of Vojvodina, Novi Sad



9. Special Hospital for treatment of Neuromuscular Diseases, Novi Pazar




 Project meetings: **October 2012 – October 2016**

Kick-off meeting, Belgrade



Progress meeting, Ljubljana



Progress meeting, Patras






Project Management Board (PMB):

University of Belgrade: **Aleksandar Sedmak** (coordinator), **Vladimir Simeunović** (Institute Mihajlo Pupin), **Aleksandar Veg** (Faculty of Mechanical Engineering), and new member **Dejan Popović** (University of Belgrade, consultant)

University of Novi Sad: **Nikola Jorgovanović** (Faculty of Technical Sciences)

The State University of Novi Pazar (SUNP): **Miladin Kostić** (**Lana Popović Maneski** during the first year)

Clinics for rehabilitation "Dr Miroslav Zotović", Belgrade: **Ljubica Konstantinović**

Child and Youth Health Care Institute, Novi Sad: **Bojana Petrovački Dejanović**

Speical clinics for rehabilitation Novi Pazar: **Saida Biševac**

University of Genoa, Italy: **Vittorio Sanguineti**

University of Ljubljana, Slovenia: **Marko Munih**

University of Patras, Greece : **Nicolas Pallikarakis**



Local Project Management Board (LPMG)

University of Belgrade: **Aleksandar Sedmak** (coordinator), **Vladimir Simeunović**, **Aleksandar Veg**, **Dejan Popović**, **Lana Popović Maneski**

University of Novi Sad: **Nikola Jorgovanović**

The State University of Novi Pazar (SUNP): **Miladin Kostić**

Clinics for rehabilitation "Dr Miroslav Zotović", Belgrade: **Ljubica Konstantinović**

Child and Youth Health Care Institute, Novi Sad: **Bojana Petrovački Dejanović**



Speical clinics for rehabilitation Novi Pazar: **Saida Biševac**




- HUTON established a national interdisciplinary training team and built the new curriculum on aspects of effective use of assistive systems and their interaction with humans with special needs.
- HUTON team offers an opportunity for state-of-the-art training of professional to the level of masters (**60 ECTS** after 240 ECTS).
- The term “special needs” is used to encompass physical disability and disability created through ageing.
- Training is being delivered through a set of activities that include individual and group teaching, skill-related workshop participation and other didactically optimized knowledge transfer procedures.
- The wide-ranging interdisciplinary and multidisciplinary training would enhance the career perspectives of the fellows in clinical settings.



- The HUTON curriculum assists the development of skills: optimized services for humans with special needs.
- The HUTON curriculum was prepared to allow graduate to think analytically and creatively, examine issues from a wide variety of perspectives, identify problems and employ appropriate strategies toward their solution, know how to locate, evaluate and apply information needed to solve a problem, use scientific methods of inquiry and apply modern technology.
- The HUTON would assist the graduates to become effective communicators who read, listen and view interpretively and critically, and communicate in an organized and clear manner.
- The training philosophy is envisioned in accordance with established educational principles: mentor-guided studying, self-directed learning, and structured information delivery in the form of lectures and seminars.

 	
Curriculum: Mechatronics in medical rehabilitation	
MANDATORY COURSES	COURSE RESPONSIBLE
Mechatronic Systems	Aleksandar Veg, Belgrade
Principles of motor control in humans	Dejan Popović, Belgrade
Methods for assessing functional abilities	Ljubica Konstantinović, Belgrade
Signals and systems in rehabilitation	Lidija Matija / Lana Popović-Maneski, Belgrade
ELECTIVE COURSES	
Mechanics of robots	Branislav Borovac, Novi Sad
External control for biological actuators	Nikola Jorgovanović, Novi Sad
Control and sensors in rehabilitation devices	
Pneumatic and hydraulic actuators	
Electrical and magnetic actuators	
Method and instrumentation for movement analysis	
Microcomputers in rehabilitation	
Scientific and experimental methods in rehabilitation	Ljubica Konstantinović
Robotics in rehabilitation	
Biostatistics	

The course where the name of course responsible appears are planned for the year 2016/17.

		
ELEMENTS FROM THE LOGICAL FRAMEWORK MATRIX		
Wider Objective:	Indicators of progress	RESULTS
<p><i>What is the overall broader objective, to which the project will contribute?</i></p> <p>Creation of the interdisciplinary and multidisciplinary curriculum and educational network to train professional working in the domain of services to assist humans with special needs</p>	<p><i>What are the key indicators related to the wider objective?</i></p> <p>1. Co-operation agreements between the educational network and stakeholders for placements of professionals into the new curriculum.</p> <p>2. More people included in the life-long learning of new job-required skills</p>	<p>1. Co-operation agreements have been signed between the three partners: University of Belgrade, University of Novi Sad and State University of Novi Pazar.</p> <p>2. The core network center was created within the University of Belgrade and the tele-link was created with other institutions (teaching and clinical partners).</p> <p>3. The curriculum has been created along the rules and fit the trends of modern European education at the master level in the domain of biomedical engineering and mechatronics.</p> <p>4. A team was created to support the new curriculum.</p>





ELEMENTS FROM THE LOGICAL FRAMEWORK MATRIX



Specific Project Objectives:	Indicators of progress	RESULTS
<p><i>What are the specific objectives, which the project shall achieve?</i></p> <ol style="list-style-type: none"> 1. New accredited interdisciplinary and multidisciplinary curriculum in the field of new technologies for assisting humans with special needs. 2. The network that supports the new curriculum. 3. Training of staff for providing on-the-job education and new employment opportunities 	<p><i>Quantitative and qualitative indicators showing whether and to what extent the project's achievements</i></p> <ol style="list-style-type: none"> 1. Increased interest for the new curriculum from professionals. 2. Increased interest from the stakeholders for the professionals with skills in improved delivery of services. 3. Better efficiency which follows the new curriculum and teaching methodology. 	<ol style="list-style-type: none"> 1. The curriculum for the academic master degree has been accredited and allows implementation and enrolment in all three partner universities. 2. The total number of trainees at this point is about 20 from all three institutions. 3. Network facilitation of the e-learning and support for project based learning has been tested. 4. Staff for the curriculum implementation has been selected and approved by the all universities. 5. The board for the quality control had been formed.







ELEMENTS FROM THE LOGICAL FRAMEWORK MATRIX

Outputs (tangible) and Outcomes (intangible):	Indicators of progress	RESULTS
<p><i>The list of concrete DELIVERABLES - outputs/outcomes (grouped in Work packages), leading to the objectives:</i></p> <ol style="list-style-type: none"> 1. Development and maintenance of the network and forming of the core of experts for the delivery of the curriculum leading to the specialist degree 2. Design of new courses and restructured existing courses with supporting teaching materials 3. Development of the Laboratory facilities that support the new curriculum 4. Implementation the new curriculum 5. Teachers for the new curriculum trained for the new methods of knowledge transfer 6. Progress review and future activities plan 	<p><i>Indicators to measure whether and to what extent the project achievements:</i></p> <ol style="list-style-type: none"> 1. Defined outcomes for new courses 2. Defined syllabi for the curriculum 3. New knowledge transfer methodology developed and implemented 4. Purchased laboratory and network hardware/software installed and tested 5. Teaching material published in e-format and hard copies 6. Project quality control provided 7. Project management harmonized and synchronized with the phases of the development of the curriculum, laboratories and network e-learning capacity 8. Sustainability of project results ensured. 9. Constant communication to ensure the flow of information between partners 	<ol style="list-style-type: none"> 1. The staff is trained for the use and maintenance of the web portal and resources for the networking. 2. Laboratory space has been created. New equipment is installed and has been already tested in some pilot research studies by the staff. 3. Teaching material (text books) for the core courses has been published or is in the process of being published and it is available for the trainees. available, staff in labs available, integration capabilities for integration through the new network. 4. Students are enrolled into the program along the rules set by the curriculum. There is a delay in the enrollment due to the differences between the local rules and slower accreditation than expected.

  ELEMENTS FROM THE LOGICAL FRAMEWORK MATRIX	
Activities:	RESULTS
<u>Workpackage 1</u> 1.1 Network structure development 1.2 Demonstration and Training Centre 1.3 Review of the existing laboratories and IT hardware and software 1.4 New training Web services development 1.5 Startup and maintenance	DONE
<u>Workpackage 2</u> 2.1 Review content of syllabi of existing courses at partner sites 2.2 Definition of syllabi for new courses 2.3 Development of the new teaching materials 2.4 Training of teaching staff	DONE

  ELEMENTS FROM THE LOGICAL FRAMEWORK MATRIX	
Activities:	RESULTS
<u>Workpackage 3</u> 3.1 Planning for purchasing of new equipment 3.2 Preparation of the tender documentation 3.3 Training of the laboratory staff	DONE
<u>Workpackage 4</u> 4.1 Accrediting of new study programs 4.2 Teaching of new study programs 4.3 Development practical placement strategy	DONE

 European Commission TEMPUS	ELEMENTS FROM THE LOGICAL FRAMEWORK MATRIX	
Activities:	RESULTS	
Workpackage 5 5.1 Monitoring of project realization and results quality	DONE	
Workpackage 6 6.1. Creating and maintaining the project interactive web portal 6.2. Organizing seminars to promote project results 6.3. Publishing advertising materials (brochures, newsletters) 6.4. Promoting project results in media (radio, TV, press)	DONE	
Workpackage 7 7.1 Ensuring sustainability of project results	DONE	
Workpackage 8 8.1 Establishing management structure and delegating teams 8.2 Organizing meetings and regular communication of Local Coordination Team 8.3 Organizing of the meetings of the consortium	DONE	

 European Commission TEMPUS	Some practical details of the teaching organization	
<ul style="list-style-type: none"> • The teaching during the first year will be organized in the HUTON developed center (Institute "Mihajlo Pupin", Belgrade), and at the University of Novi Sad. • Students will use the telelink for the lectures if necessary. • Laboratory work will be organized by the course responsible in the space that is dedicated for this curriculum where special equipment/instrumentation is installed at the location of all three clinical partners by the teaching staff. • Student's travel fees are covered during the duration of the project (when and if necessary). 		



Some practical details of the teaching organization



The individual curriculum for a student is formed by: **four** mandatory courses (24 ECTS), **three** elective courses (15 ECTS), **practical work** (3 ECTS), **research project** (10 ECTS) and **final project - master thesis** (8 ECTS).

The total number of ECTS is 60. With the 60 ECTS from the HUTON curriculum, students who enter into the program with 240 ECTS, accumulate **300 ECTS** and the title

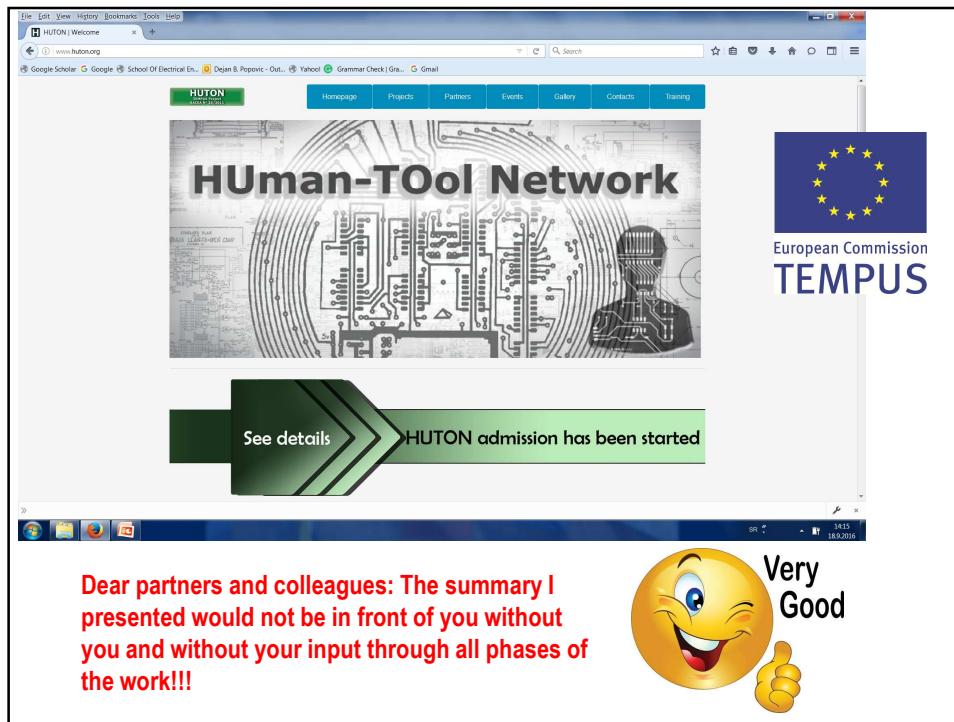
"Master of Mechatronics in Medical Rehabilitation".



Some practical details of the teaching organization



- The final project (thesis hypothesis) is being formulated during the first three weeks of teaching and each student gets a mentor who is responsible for the guidance that results with the excellence.
- The plan is that students finalize the whole program within 12 months.
- Practical work will be organized by one of the clinical partners during the three weeks period.



The screenshot shows a web browser displaying the HUTON website. The main banner features the text "HUMAN-TOOL Network" over a background of circuitry and a stylized human head. To the right is the European Commission TEMPUS logo. Below the banner is a green button labeled "See details" and a green bar stating "HUTON admission has been started". The browser's address bar shows "www.huton.org".

Dear partners and colleagues: The summary I presented would not be in front of you without you and without your input through all phases of the work!!!

Very Good