University of Ljubljana
Faculty of Electrical Engineering
Laboratory for Telecommunications

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TEMPUS partner presentation
University of Ljubljana

- Founded in 1919
- Consists of 22 Faculties & 3 Academies
- Approx. 6,000 employees
- Approx. 56,000 students

Faculty of Electrical Engineering

- Approx. 2,500 students, going down 😎
- Approx. 300 employees

Department for Telecommunications

Laboratory for Telecommunications (LTFE)
Research on Faculty of EE

- Research projects are of different types, mostly depending on the source of funding
  - projects that are fully funded by national or EU budgeted
  - projects that are fully funded by companies
  - many variations in between

- Turnover of the FE 12.5 mio Euro
  - 50% comes from the education
  - 50% comes from research projects

- This is the highest ratio of budget coming from research projects among members within University of Ljubljana
  - the goal is to further increase research funds from industry and other non-public resources to more than 50%
Faculty of Electrical Engineering, University of Ljubljana
- Excellence in advanced telecommunications with tradition

Research & Development
- Telecommunication networks, services and solutions
- Multimedia systems and solutions
- Protocols and applications
- Testing, measurements and evaluation
- Research studies and analyses
- Project cooperation and consulting
- Multimedia learning (LMS/LCMS) and content development

Professional training
- Educational courses, workshops and e-learning courses for organizations and individuals
- Cisco Networking Academy
- Apple certified trainers (AATCE)
**LTFE Products, Services and Solutions**

- **Products and solutions**
  - LMS/LCMS platform - [e-cho](http://www.e-cho.org)
  - Educational web TV - [SiTV](http://www.sitv.tv)
  - Multimedia content development tool - [Coome](http://coome.ltfe.org)
  - Mobile educational gaming platform - [QFK](http://qfk.ltfe.org)
  - Broadband network optimization tool – BANet
  - Messaging services framework (SMS, MMS)
  - ICT Academy
Cooperation and networking

**Key partners**
- Vendors: Iskratel, Cisco, Juniper, Extreme, Telsima
- Service Providers (Slovenia): Mobitel, Telekom Slovenije, Siol, RTV Slovenije
- Governmental institutions: ATRP, MVZT, MG, APEK
- International institutions: EU FP6 in FP7, PHARE, COST, IFIP, ITU, IEEE, IEICE, TEMPUS

**Creating innovation environment**
- Lead partner Centre of Excellence for ICT
- Project and programme coordinator for Technology Network ICT
- Slovenian Technology Platforms (eMobility, NEM, NESSI, ARTEMIS)
Multimedia Curriculums - overview

- **Multimedia communications**
  - 3 years – Vocational higher education (a.k.a. “applied sciences”)
  - Less theoretical topics, more practical
  - Started in 2007

- **Multimedia**
  - 3 years – University (undergraduate) programme
  - More theoretical topics, basis for Masters programme
  - Approved at the University, awaiting approval on national level

- **In preparation**
  - 2 years - Multimedia masters programme
Multimedia communications
A number of participating institutions:

- **FE** Faculty of electrotechnics
- **FRI** Faculty of computer and information science
- **ALU** Academy of fine arts and design
- **AGRFT** Academy of theatre, radio, film and television
- **FF** Faculty of arts
- **FDV** Faculty of social sciences
- **PF** Faculty of law

Interdisciplinary curriculum
Combines a number of scientific fields:

- Knowledge of telecommunication and information sciences
- Production and understanding of audio-visual content
- Development and setting up of interactive web services
- Programming skills
- Understanding of legal issues related to authoring rights
- Knowledge of human psychology
- Project management and planning
- Understanding and usage of standards
Multimedia technologies I
Design I
Technological basics
Telecommunications networks
Media communications
Internet systems
Digital signal processing
Visual communications and psychology
Programming basics
English

1st Year topics
2nd Year topics

Multimedia technologies II
Web technologies
Radio-television systems
Object programming
Multimedia content
Mobile systems
Dynamic Web
Project management

2 topics of choice
3rd Year topics

Interactive multimedia
Multimedia content transfer
Convergent multimedia services
Sound, image and video processing
4 topics of choice

Practical project
Bachelors thesis
Topics of choice

Multimedia production
Studio and recording technology
Legal aspects and copyright issues
Economy
Design II
3D graphics and animation
Terminals and applications
Standards
Personalisation
Audio engineering
Equipment

- **Studio equipment**
  - Kameras, mics, lights, speakers, matrixes
  - Virtual studio

- **Broadcasting equipment**
  - Servers, multiplexers, modulators, receivers, transcoders,…

- **Application development**
  - PCs, Mac, smart phones, tablets
  - SW Licences
  - Usability evaluation
  - Eye tracking,…
Multimedia
“new “ Multimedia curriculum

- Similar to Multimedia communications curriculum with the following differences:
  - More mathematics
  - More computer programming (app development)
  - More usability aspects
  - No legal aspects (to be included in Masters programme)
  - Less design oriented topics

- A good basis for masters programme
  - 2014?
Experience and lessons learned

- Equipment is expensive
  - Need enough units for lab work

- Many assistants for some topics
  - Studio work vs. tutorial

- Students are very heterogenous
  - Engineers vs. Creatives
  - Poor mathematical basis
  - Difficult to attract everybody

- Industry appreciates knowledge and topics
  - Many projects
  - Students do find jobs
Thank you!