First South East European
Regional CIGRÉ Conference
SEERC
Portoroz, Slovenia, 7—8 June 2016

University of Belgrade
(top 400 in the world)
School of Electrical Engineering

Dr. Zlatan Stojković, Full Professor

University of Belgrade (top 400 in the world)

- Established in 1808, the University of Belgrade is the oldest and the biggest high school institution in Serbia
- There are 31 faculties and 11 institutes
- The University counts 8500 professors and assistants that teach around 85.000 students
- Since 2012 the University of Belgrade belongs to Shanghai list of universities, among 400 universities in the world (top 2%)

School of Electrical Engineering Belgrade

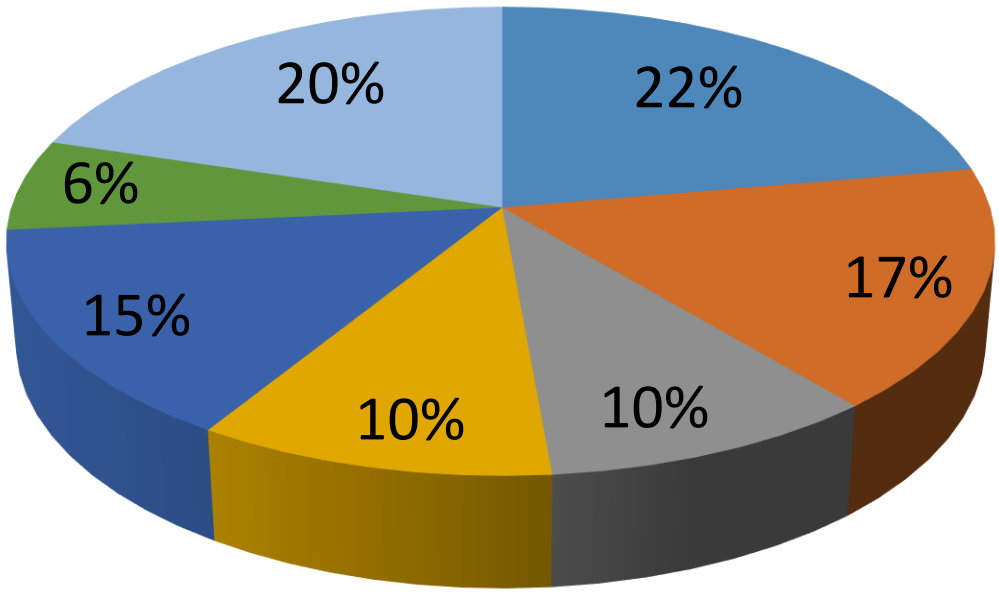
- Established in 1948
- At present includes:
  - 7 divisions
  - 42 laboratories
  - 136 professors
  - 46 assistants
  - Total of 4423 students

SEE - divisions

- In 2015 total of 672 students enrolled in the first year of undergraduate studies (400 (budget) + 148 (self-financing) + 124 (software engineering))
- Distribution of students in the 2nd year of undergraduate studies:
  - Computer science: 120
  - Power engineering: 90
  - Electronics: 52
  - Signals and Systems: 55
  - Telecommunications and information technologies: 79
  - Physical electronics: 34
  - Software engineering: 109

SEE - divisions

Distribution of students in the 2nd year



- Computer science
- Power engineering
- Electronics
- Signals and Systems
- Telecommunications
- Physical electronics
- Software engineering

Power Engineering prior to Bologna

- Undergraduate studies – 1st joint year + 4 years
- Graduate studies – 5 subjects + Master Thesis
- PhD Dissertation
- Altogether around 10 years

Power Engineering Bologna (from 2003 to 2013)

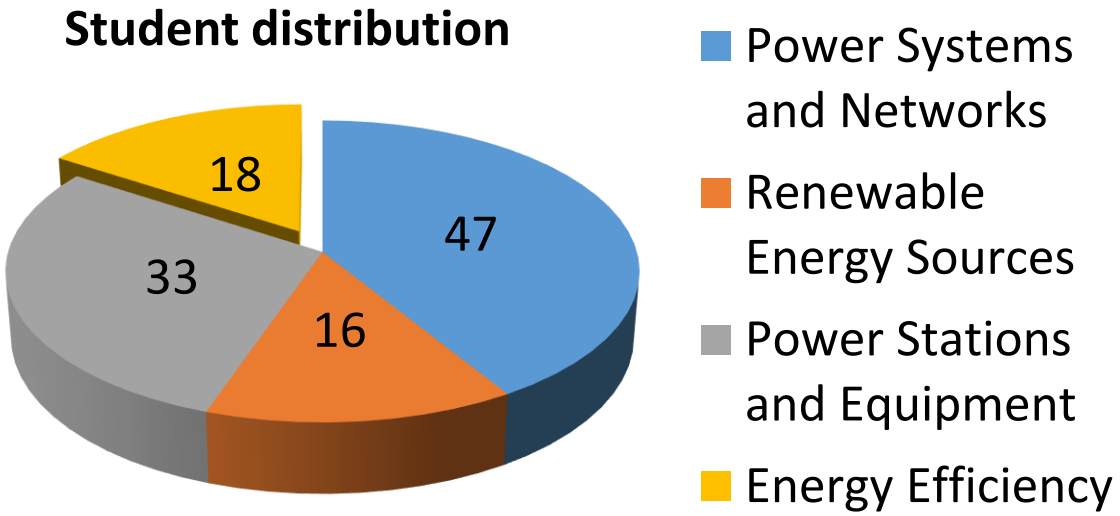
- Undergraduate studies – 1st joint year + 3 years (240 ECTS)
- Master degree studies – 5 subjects + Master Thesis

  (60 ECTS)
- Doctoral academic studies (180 ECTS)

  - 10 subjects
  - Research Paper
  - Dissertation
- Altogether around 10 years

Power Engineering now (since 2013)

- Undergraduate studies -1st joint year + 3 years
  - 33 mandatory subjects + 23 elective courses
- Master degree studies – 4 modules and 114 students in 2015



- Doctoral studies
  - Power Systems
  - Electrical Drives

Power Engineering now
Undergraduate studies

Mandatory subjects

Power System Elements

Electrical Machines

Power System Analysis

High Voltage Technique

Power Substations

Distribution Networks

Relay Protection

And much more out of 33

Elective courses

Computer Aided Design

High Voltage Equipment

Power Quality

Renewable Energy Sources

Market of Electrical Energy

Electrical Vehicles

And much more out of 23

Power Engineering now
Master degree studies - Modules

Power Systems

Planning of PS

Smart Grid

Distribution Automation

PS Exploitation

PS Control

Technical Systems of Control

Power Substations and Equipment

Monitoring and Diagnostics of HV Substations

Digital Relay Protection

Electromagnetic Compatibility

Cable Technique

Renewable Energy Sources

Integration of RES

Energy Storage

PS Control with RES

Power Electronics in RES

Elective courses

3 courses from selected module + 2 courses from any module

Power Engineering now
Doctoral academic studies

Elective courses

High Voltage Measurements

Application of Software Tools in Power Engineering

Reliability of Power Systems

Distribution Systems – optimal planning and operation

Wind Energy and Solar Energy

FACTS Devices

Information Technologies in Power Systems

Microprocessor Control of Power Electronics

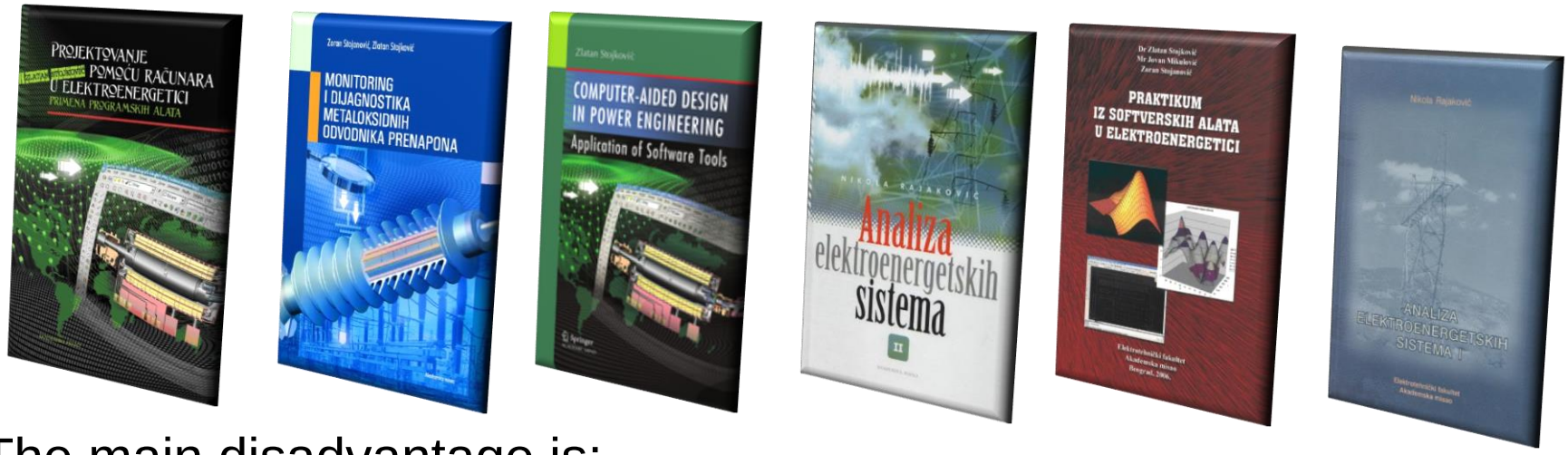
And much more out of 21

School of Electrical Engineering Belgrade

- **408** graduated students in 2015
- **292** Master Thesis in 2015
- PhD Dissertations
  - **2012**: 6 (new program) + 16 (old program) = **22**
  - **2013**: 11 + 31 = **42**
  - **2014**: 12 + 5 = **17**
  - **2015**: 23 + 10 = **33**

Advantages and Disadvantages

- The main advantages are:
  - The possibility of participation in parts of the international and national projects and studies
  - Literature (Web Site of Academic Mind and about 40 books (few for foreign publishers))
  - Job possibilities

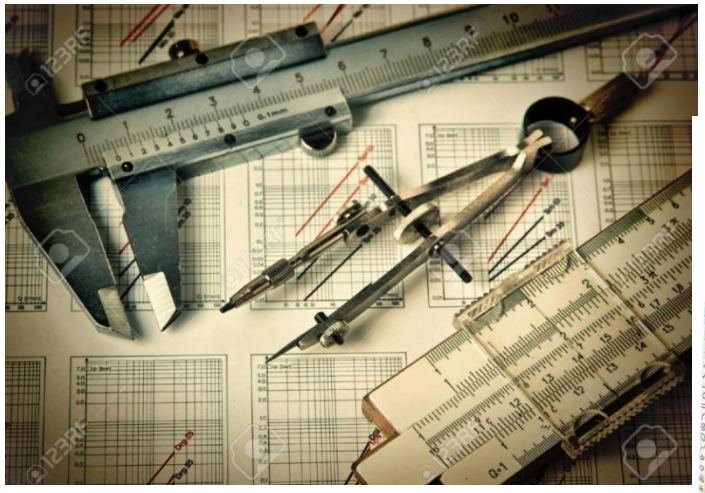


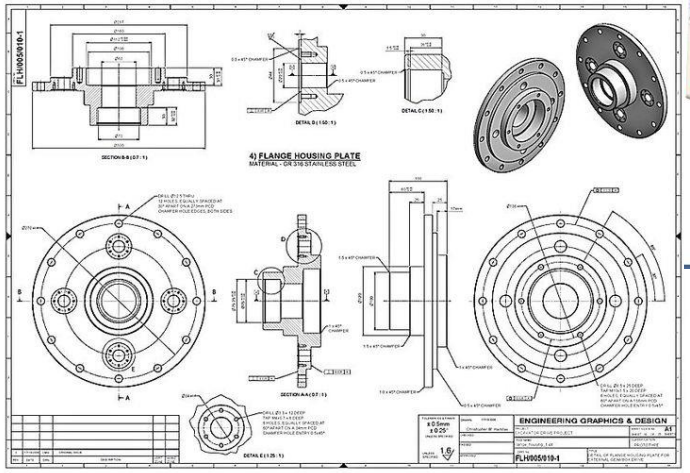
- The main disadvantage is:
  - Lack of space

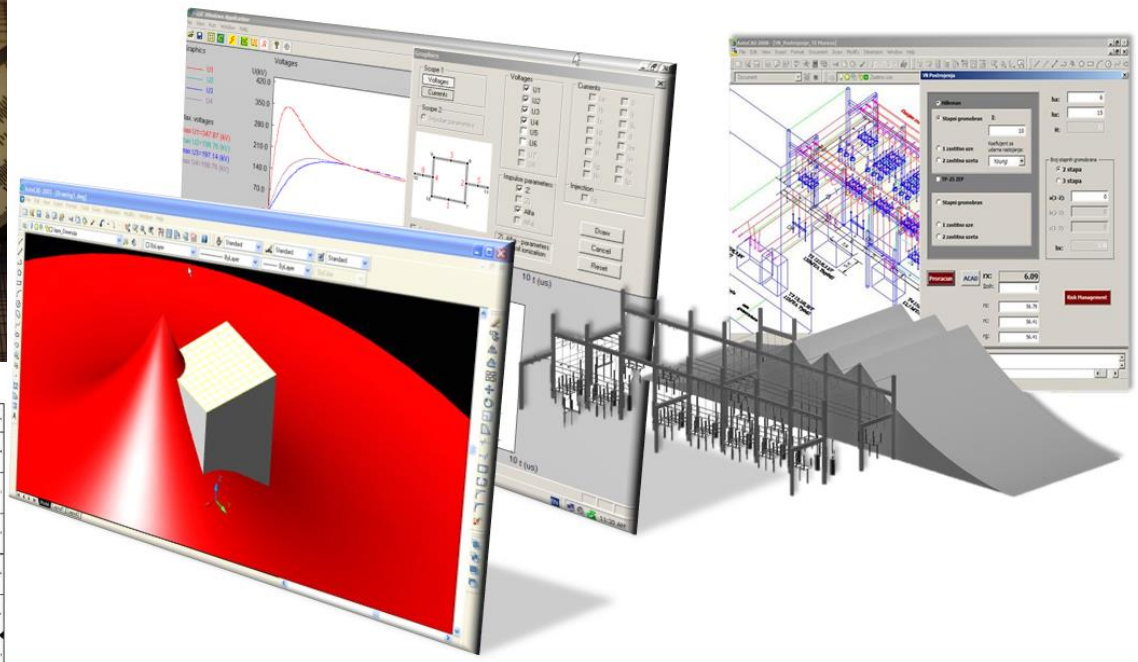
Job Possibilities

- Power Utility
- Institutes
- Design and Building Firms
- Private Sector
- Industry
- Renewable Energy, Software Engineering, etc.

Project Development: Old vs. New

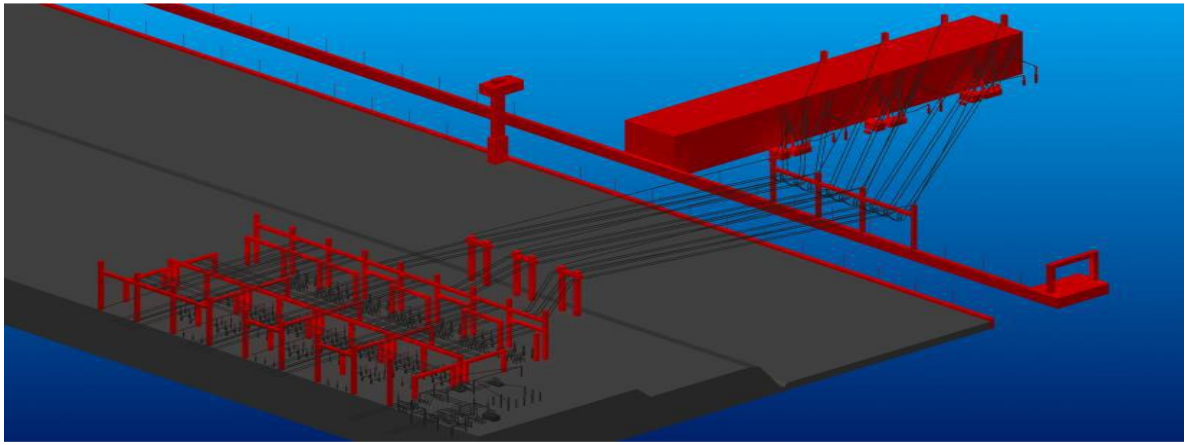




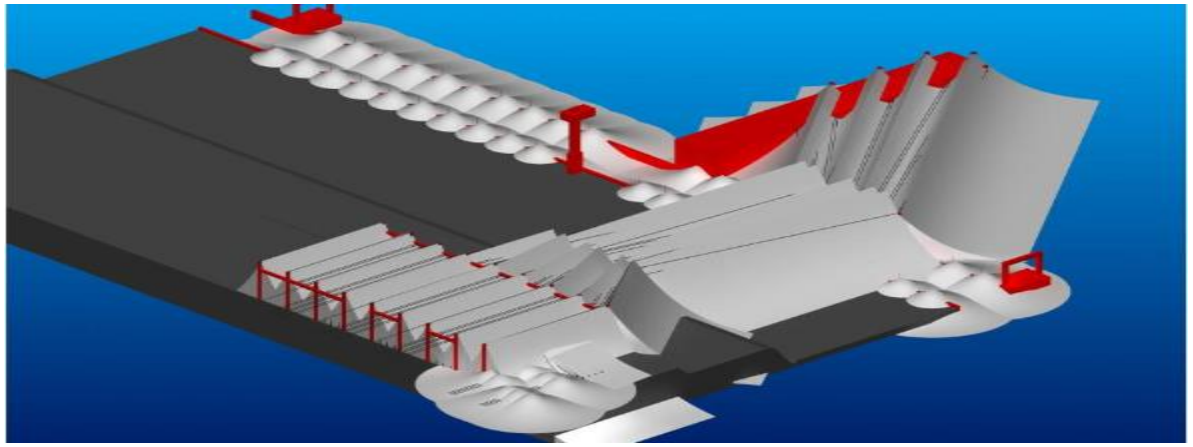


Software Tool for High Voltage Substation Risk Management against Lightning

CAD/CAE Software Tools



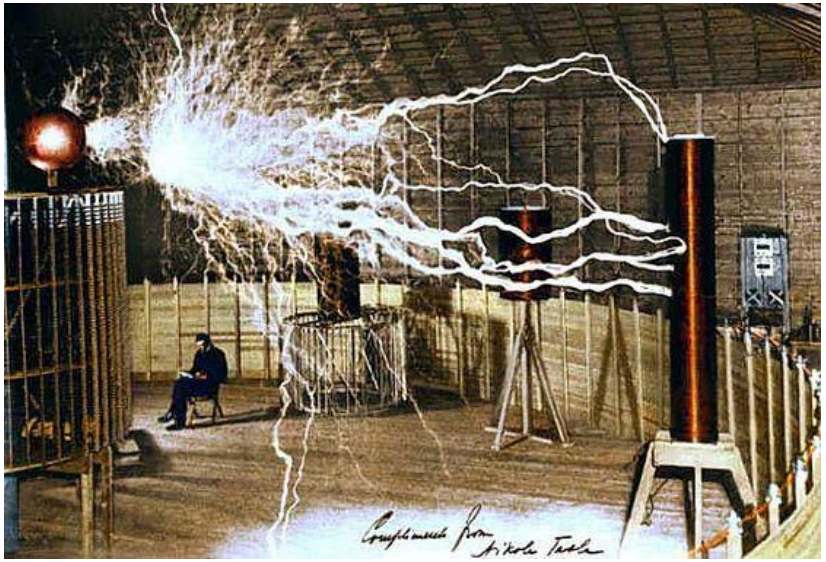
HEP Djerdap 1 with substations 400 kV and 110 kV



Rendered model of the protection zone of the HEP Djerdap 1

High Voltage Technique

- Old discipline – New technology



Conclusions

- The educational system was and is constantly being upgraded to include teaching methods and tools that were verified in the leading teaching institutions in the world
- The teaching has the strong theoretical and practical components
- The emphasis on design centered education is at the graduate level (final engineering, master and doctoral projects)
- A good balance is needed between the basic and new disciplines

Thank you for your attention

Dr. Zlatan Stojković, Full Professor
zstojkovic@etf.rs