



**First South East European
Regional CIGRÉ Conference**

SEERC

Portoroz, Slovenia, 7—8 June 2016

**University of Ljubljana
Faculty of Electrical Engineering**

Igor Papič
Dean

University of Ljubljana

- established in 1919
- 50.000 graduate and postgraduate students
- approximately 4000 higher education teachers
- 23 faculties and 3 art academies



Faculty of Electrical Engineering

- 1919: establishment of the University of Ljubljana and Technical faculty – beginning of Electrical Engineering study
- 1925: first graduate in electrical engineering
- till today: more then 11.000 graduates in all programs



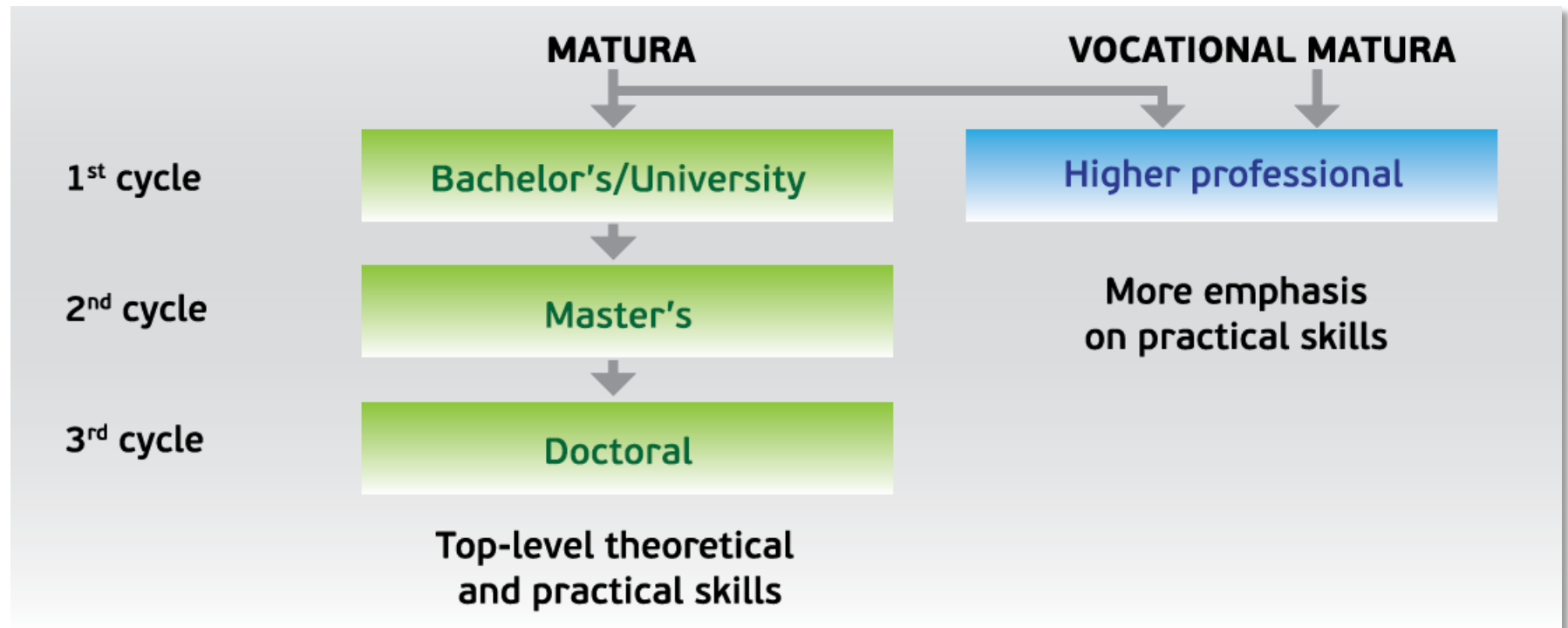
Faculty of Electrical Engineering

A few facts about the faculty today

- 364 employees
- 120 teachers, around 170 researchers ...
- Organization:
 - 9 departments, 33 laboratories, administration
- Activities:
 - education (study programs)
 - research (public calls, industry)
- Budget: approximately 18 million €
 - 46% education, 34% public calls, 20% industry

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Education activities



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Education activities

1st cycle (3 years)

- **Electrical Engineering (UN)**
 - fields in 3rd year: Control Systems, Electronics, Telecommunications, **Power Engineering and Mechatronics**
- **Applied Electrical Engineering (HP)**
 - fields in 2nd year: Control Systems, Electronics, **Power Engineering Technology and System Automation**, Telecommunications, Quality Engineering
- **Multimedia Communications (HP)**
- **Multimedia (UN)**

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Education activities

2nd cycle – master's study (2 years)

- **Electrical Engineering**
 - fields Control Systems and Computer Engineering, Biomedical Engineering, **Electrical Power Engineering**, Electronics, Mechatronics, Robotics, Telecommunications
- **Applied Statistics**
 - part-time study

3rd cycle – doctoral study (3 years)

- **Electrical Engineering**

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Research activities (2014)

- 14 research programmes and one infrastructure programme (30.0 FTE; 1,72 mio €)
- 41 research projects (12.1 FTE; 850,000 €)
- 64 junior researchers – research agency and industry
- 34 EU projects (1,62 mio €): 13 FP7, 6 COST, 4 EMRP, 3 TEMPUS, 3 ERASMUS +, 2 SEE, ALPINE SPACE, CIP, ...
- 2 bilateral projects: USA, France
- 120 contracts 3,16 mio € (2,95 mio € with Slovenian companies, 215,000 € with foreign companies)

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Research activities – Ranking citations per published paper (2005-2014)

uvrstitev	univerza	fakulteta	kraj	cit / delo
1	Eidgenössische Technische Hochschule (ETH) Zürich	Departement Informationstechnologie und Elektrotechnik	Zürich, Švica	13 . 18
2	Technische Universität Berlin	Fakultät IV: Elektrotechnik und Informatik	Berlin, Nemčija	12 . 19
3	Bergische Universität Wuppertal	Fakultät für Elektrotechnik, Informationstechnik und Medientechnik	Wuppertal, Nemčija	12 . 05
4	Technische Universität München	Fakultät für Elektrotechnik und Informationstechnik	München, Nemčija	9 . 18
5	Universität Stuttgart	Fakultät 5: Informatik, Elektrotechnik und Informationstechnik	Stuttgart, Nemčija	8 . 31
6	Univerza v Ljubljani	Fakulteta za elektrotehniko	Ljubljana, Slovenija	7 . 76
7	Technische Universität Ilmenau	Fakultät für Elektrotechnik und Informationstechnik	Ilmenau, Nemčija	7 . 75
8	Universität Kassel	Fachbereich Elektrotechnik / Informatik	Kassel, Nemčija	7 . 38
9	Ruhr-Universität Bochum	Fakultät für Elektrotechnik und Informationstechnik	Bochum, Nemčija	7 . 09
10	Università di Cagliari	Dipartimento di Ingegneria Elettrica ed Elettronica	Cagliari, Italija	7 . 01
11	Università di Bologna	Dipartimento dell'Energia Elettrica e dell'Informazione "Guglielmo Marconi"	Bologna, Italija	6 . 64
12	RWTH Universität Aachen	Fakultät für Elektrotechnik und Informationstechnik	Aachen, Nemčija	6 . 42
13	Politecnico di Torino	Dipartimenti di Energia; Automatica e Informatica; Elettronica e Telecomunicazioni	Torino, Italija	6 . 04
14	Technische Universität Dresden	Fakultät Elektrotechnik und Informationstechnik	Dresden, Nemčija	5 . 96
15	Technische Universität Dortmund	Fakultät für Elektrotechnik und Informationstechnik	Dortmund, Nemčija	5 . 73
16	Technische Universität Wien	Fakultät für Elektrotechnik und Informationstechnik	Dunaj, Avstrija	5 . 69
17	Univerzitet u Beogradu	Elektrotehnički fakultet	Beograd, Srbija	5 . 51

48 faculties of electrical engineering in Central Europe and the Region*

* Switzerland, Germany, Czech Republic, Slovakia, Italy, Austria, Hungary, Slovenia, Croatia, Bosnia & Hercegovina, Serbia, Montenegro, Macedonia

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Electrical Power Engineering fields

- Power Systems
- Smart Grids
- The Electricity Market
- Compensation Devices
- Thermal Power Plants
- Hydro Power Plants
- Renewable Energy Sources
- Nuclear Technology and Safety
- Lighting Engineering
- Electrical Installations



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Electrical Power Engineering Laboratories

- **Laboratory of Electric Power Supply**
 - <http://lpee.fe.uni-lj.si>
- **Laboratory of Electricity Networks and Devices**
 - <http://leon.fe.uni-lj.si>
- **Laboratory of Power Systems**
 - <http://lees.fe.uni-lj.si>
- **Laboratory of Energy Policy**
 - <http://lest.fe.uni-lj.si>
- **Laboratory of Lighting and Photometry**
 - <http://lrf.fe.uni-lj.si>



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Electrical Power Engineering Courses (UN) – 1

- Circuits and Signals in Power Engineering
- Conventional Energy Sources
- Power System Disturbances
- Generators and Transformers
- Power System Design and Maintenance
- Power Distribution and Industrial Systems
- Electrical Drives
- Power System Dynamic Phenomena
- Power Quality
- Power System Protection and Control



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Electrical Power Engineering Courses (UN) – 2

- Lighting Engineering*
- Mechatronic Systems*
- Power System Design and Maintenance*
- Alternative Energy Sources and Electricity Markets*
- Power Engineering
- Modern Power Supplies*
- Materials and Technologies*
- Increasing Power System Transmission Capacity*
- Design of Electrical Machines

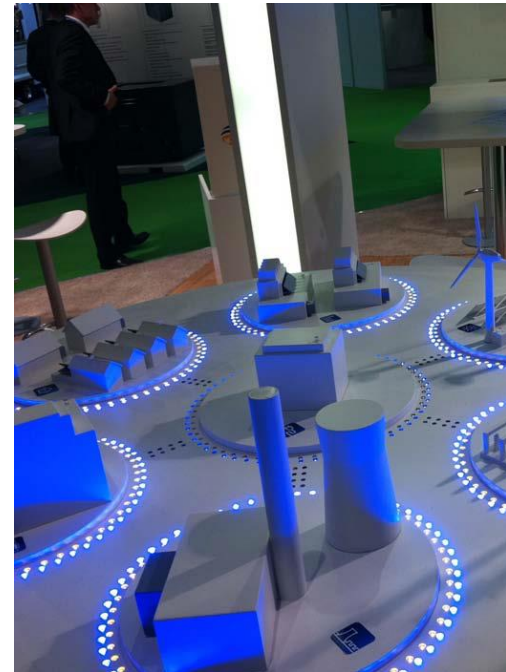


*elective courses

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Electrical Power Engineering Courses (PhD)

- Active distribution networks
- Electrical servo drives in mechatronics
- Energy conversions and environment
- Intelligent buildings
- Modern electric machines
- Photovoltaics
- Power electronics converters
- Power system operation in market environment
- Reliability in electrical power engineering



International “Energy” Doctoral Program (SEE)

- initiated by the University of Ljubljana in 2015

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Concluding Remarks

- we are facing transformation of conventional electric power systems
 - sustainable development and energy objectives
 - large scale integration of renewables
 - Smart Grids
- good understanding of conventional power system operation is crucial for introduction of changes
- universities are ready to educate new generations of power engineers
- cooperation between universities and energy industry is very important
- young power engineers will be able to cope with new challenges



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Thank you!

Igor Papič
University of Ljubljana
Faculty of Electrical Engineering
igor.papic@fe.uni-lj.si