Electronics & Telecommunication for Macrofaculty Students

Dariusz Wójcik
dwojcik@polsl.pl
Agenda

• What is modern electronics?
• What an electronic engineer should know?
• BSc studies
• MSc studies
• Job opportunities
What is modern electronics?

Electronics – the discipline dealing with the development and application of devices and systems involving the flow of electrons in a vacuum, in gaseous media, and in semiconductors. (Wikipedia)
What is modern electronics?

Electronics – the discipline dealing with the development and application of devices and systems involving the flow of electrons in a vacuum, in gaseous media, and in semiconductors. (Wikipedia)

Electronics is involved in the creation of devices and systems, focusing on the physical layer of devices. Electronics creates hardware and embedded software for processing physical signals.
What is modern electronics?
What is modern electronics?
What is modern electronics?
What is modern electronics?
Modern Electronics

Digital with small analog part, high-speed
Modern Electronics

Wireless: high frequencies, broadband, digital
Modern Electronics

Miniaturization, increasing complexity
What an electronic engineer should know?

• Mixed signals and digital circuit design, hardware-description languages, FPGA, IC design, embedded software creation

• Wireless networks, microwave engineering, antenna design, propagation analysis

• A/D and D/A conversion, digital signal processing, filtering, modulation, coding, detection
What an electronic engineer should know?

- PCB design, design for manufacturing, reliability and testing, ECAD tools
- Measurement: oscilloscopes, spectrum analyzers, network analyzers, etc.
- Legal aspects: EMC, RED, WEEE, RoHS
BSc Studies

- Mixed signal circuits design
- Digital circuits design
- Design for manufacture
- 150 h of optional courses
BSc Studies

Elective courses:

• Radio-frequency Identification Systems
• Bluetooth Standard
• Printed Circuit Board Design
• Introduction to Android Programming
• Microcontroller Programming in C
• Fundamentals of Programming in Java
• Programming Mobile Robots Based on ARM Core Microcontrollers
• Automotive Electronics
MSc Studies

- Radiocommunication
- Broadband mobile networks
- Electromagnetic compatibility
- Computer aided electronic circuits design
- Programmable logic devices
- Programmable controllers
- Power electronics
- System-level modeling and design
- Systems on chip
- Reliability and testing
- Telemedicine
MSc Studies

Elective courses:

• STM32 family ARM microcontrollers programming
• C/C++ programming for ARM microcontroller
• Graphical NVidia and ATI/AMD processors - their architecture and programming
• Systems of control and visualization
• LTE and LTE Advanced networks
• Advanced techniques of PLC programming
Job opportunities

- Aptiv (Delphi), ZF TRW, Nexteer, Bombardier, Draexlmaier, Magneti Marelli
- Cadance, Aldec, Mentor Graphics
- Nokia, Motorola
- Rockwell Automation, Aiut

see [www.iele.polsl.pl](http://www.iele.polsl.pl)
Summary

E&T is a good choice for students who want to work close to the hardware, invent and develop new devices and systems.
Electronics&Telecommunication
for Macrofaculty Students

Dariusz Wójcik
dwojcik@polsl.pl