

# Introduction to B.Sc. In Electrical and Computer Engineering



## AAiT

Addis Ababa Institute of Technology  
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Addis Ababa University  
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## School of Electrical and Computer Engineering

# Overview

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- Definitions
- Program description
- Laboratory facilities
- Possible Employment sectors



# Definitions – Electrical & Computer Engineering

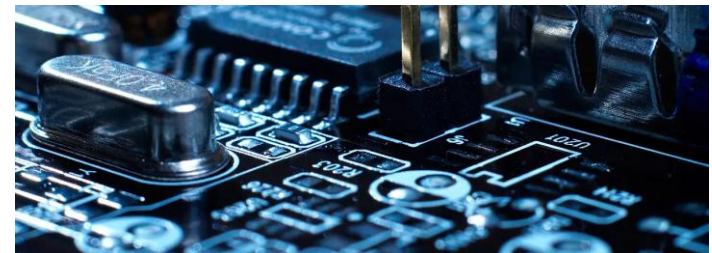
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- **Electrical Engineering:** is an engineering field that deals with the study and/or application of  
*Electricity,*  
*Electronics and*  
*Electromagnetism*
- The field first became an identifiable occupation in the late 19<sup>th</sup> century after commercialization of the electric telegraph and electrical power supply.



# Definitions – Electrical & Computer Engineering

- Electrical Engineering now covers a range of sub-studies including those that deal with:
  - *Power and energy,*
  - *Control systems,*
  - *Electronics,*
  - *Signal processing and*
  - *Telecommunications*



# Definitions – Electrical & Computer Engineering

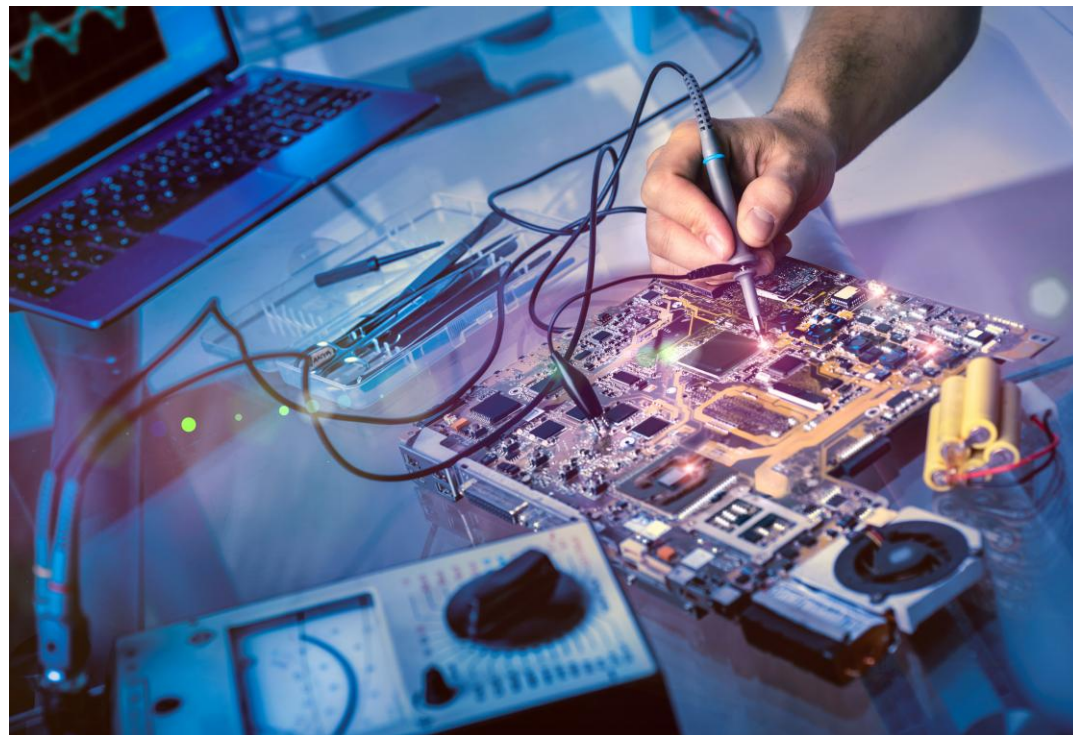
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- Computer Engineering, also called *Electronic and Computer Engineering*, is a discipline that combines elements of both  
*Electrical engineering & Computer science / engineering*
- Computer engineers are electrical engineers that have additional training in the areas of  
*Software design and Hardware-software integration*
- In turn, they focus less on power electronics and physics
- Computer engineers are involved in many aspects of computing, from the design of individual  
*Microprocessors, personal computers, and supercomputers, to circuit design*



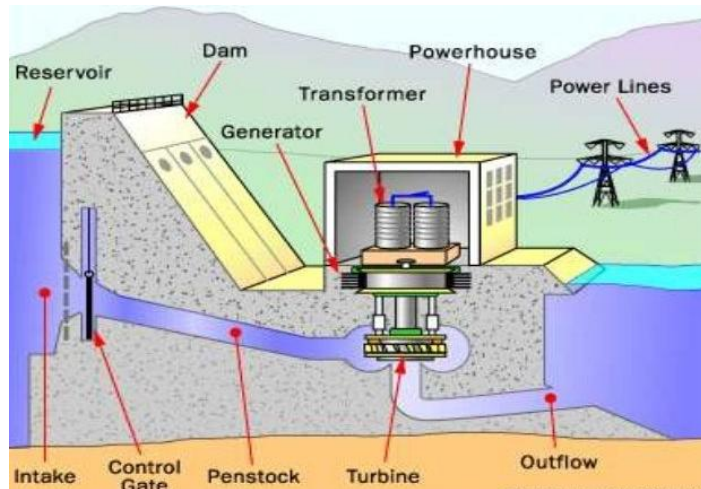
# Programs description

- General Objectives - *To train Electrical and Computer Engineers who can*
  - *Analyze,*
  - *Design,*
  - *Plan,*
  - *Construct,*
  - *Manage, and*
  - *Maintain*
    - *communication,*
    - *computer,*
    - *control,*
    - *power, and*
    - *microelectronics systems / components*



## • *Power Engineering*

- *Plan, design and supervise power stations and equipment for generators*
- *Design and produce drawings of electrical systems, using computer-assisted design (CAD)*
- *Decide on the type and arrangement of circuits, transformers, circuit-breakers, transmission lines and equipment, based on calculations*
- *Make or improve products such as electric motors, parts, equipment and appliances*



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- *Control Engineering*

- *Design and install control and signaling devices for road, rail and air traffic*
- *Design circuits for electronic control systems and instrumentation for industries and factories*
- *Prepare and supervise designs, specifications, estimates, tenders and contracts*



# Core Services...

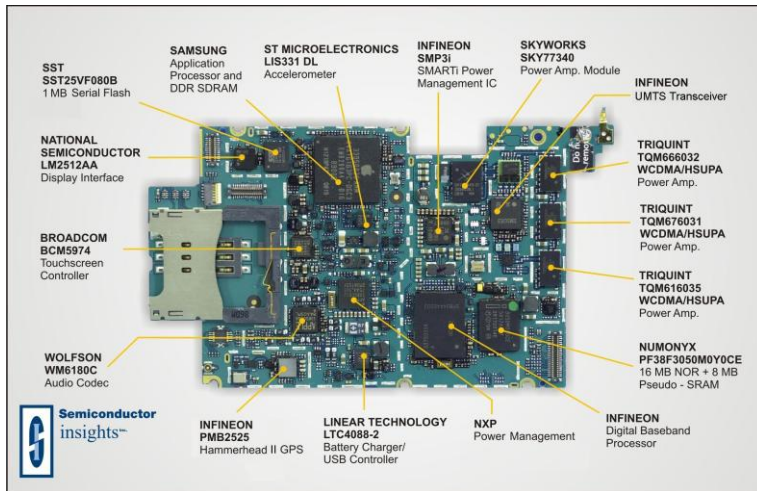
- *Communication Engineering*

- *Design telecommunications equipment and networks*
- *Plan, design and supervise telecommunication installations.*
- *Program and operate computers to assist with complex calculations*
- *Work out the type of installation, location, layout and transmission medium by assessing communication traffic and levels of service*



# Core Services...

- *Computer Engineering*
  - *Plan, design, operate and maintain computer systems.*
  - *Plan, develop, test and maintain different software.*



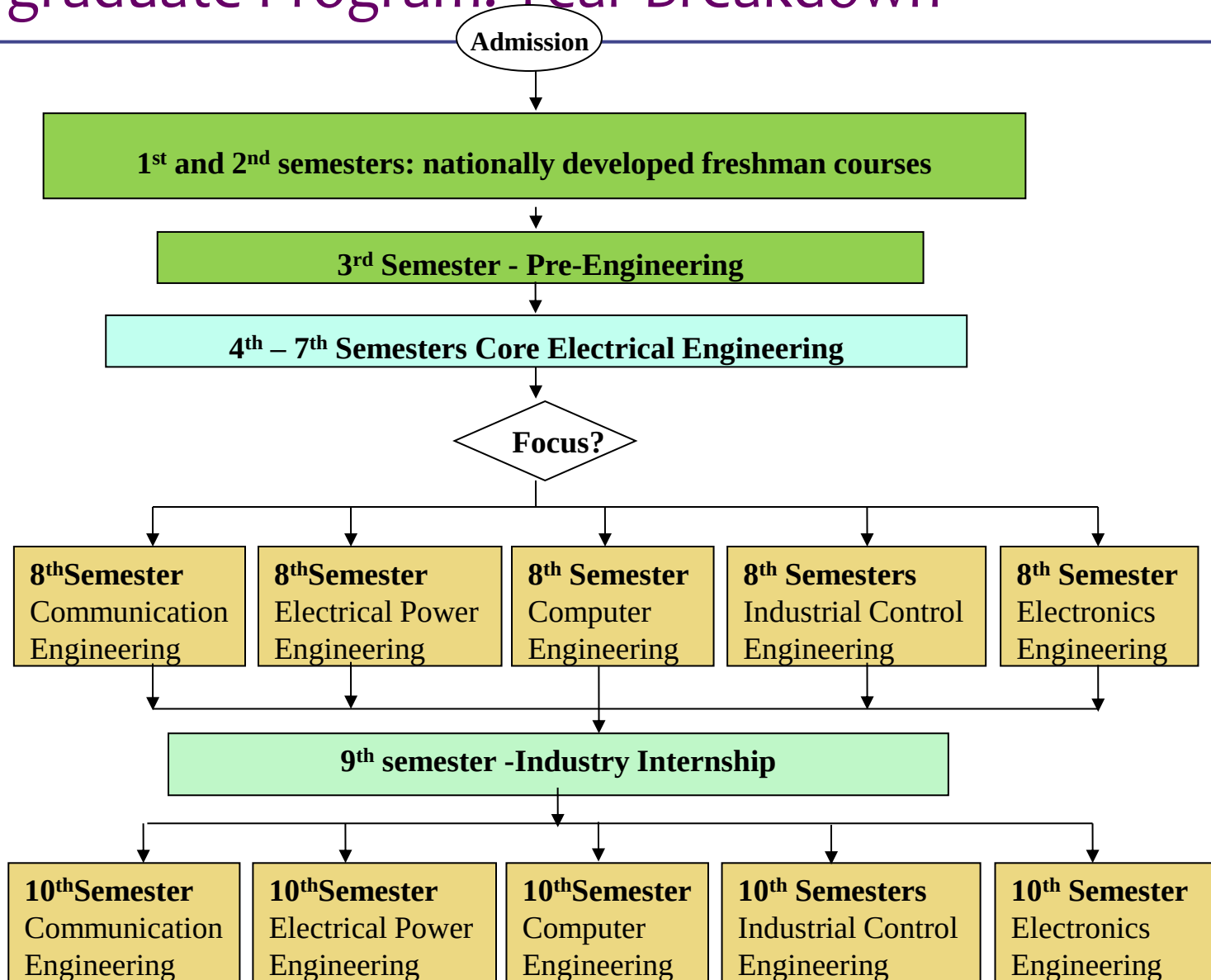
# Undergraduate Programs

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- 5 years program, and at present, running five streams
  1. Communication Engineering
  2. Computer Engineering
  3. Industrial Control Engineering
  4. (Micro)electronics Engineering
  5. Power and Energy Engineering



# Undergraduate Program: Year Breakdown



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# ECE Laboratories

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- Core Laboratories

- Fundamentals Lab: 78m<sup>2</sup>
- Applied Electronics Lab: 95m<sup>2</sup>
- Digital Design Lab: 112m<sup>2</sup>
- Machine Lab: 169m<sup>2</sup>
- Workshop: 159m<sup>2</sup>

- R&D Labs

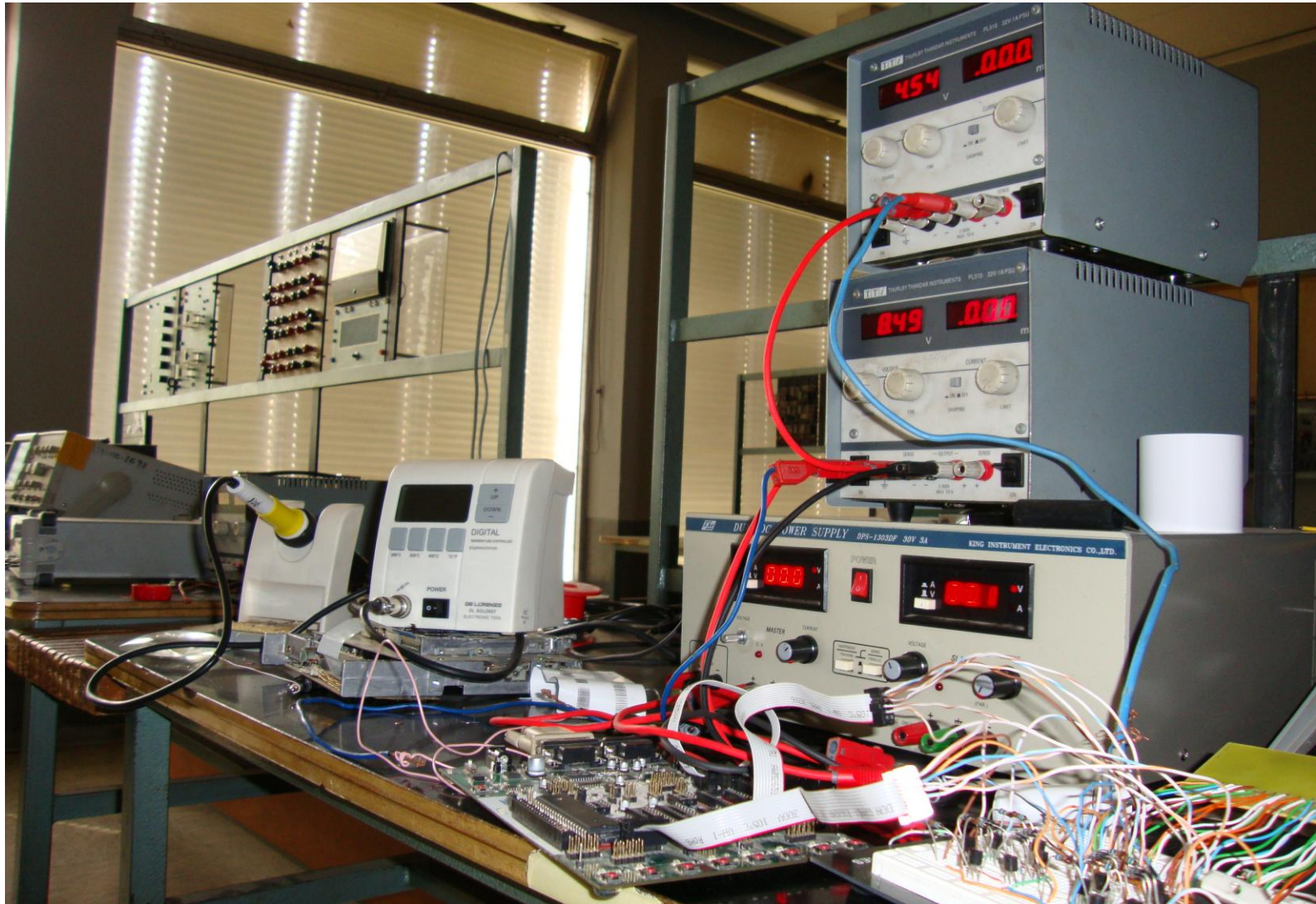
- Telecommunication and Antennas Lab: 160m<sup>2</sup>
- Power Systems Lab: 80m<sup>2</sup>
- Control and Instrumentation Lab: 47m<sup>2</sup>
- High performance computing Lab: 60m<sup>2</sup>

- Special Labs

- SCADA Systems Lab: 60m<sup>2</sup>
- High Voltage Lab: 150m<sup>2</sup>



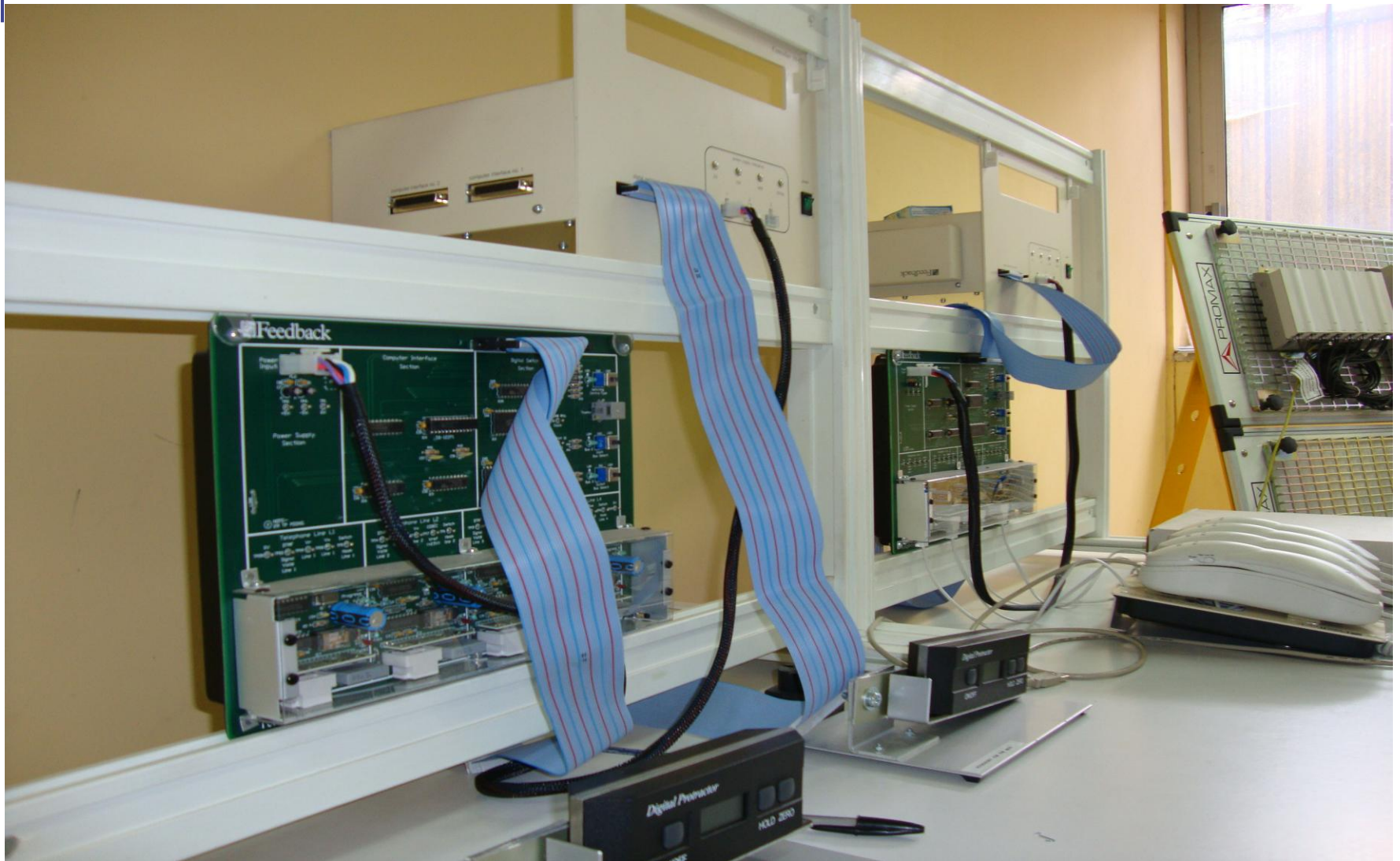
# ECE Core Course Laboratories



# ECE Core Course Laboratories



# ECE R&D Laboratories





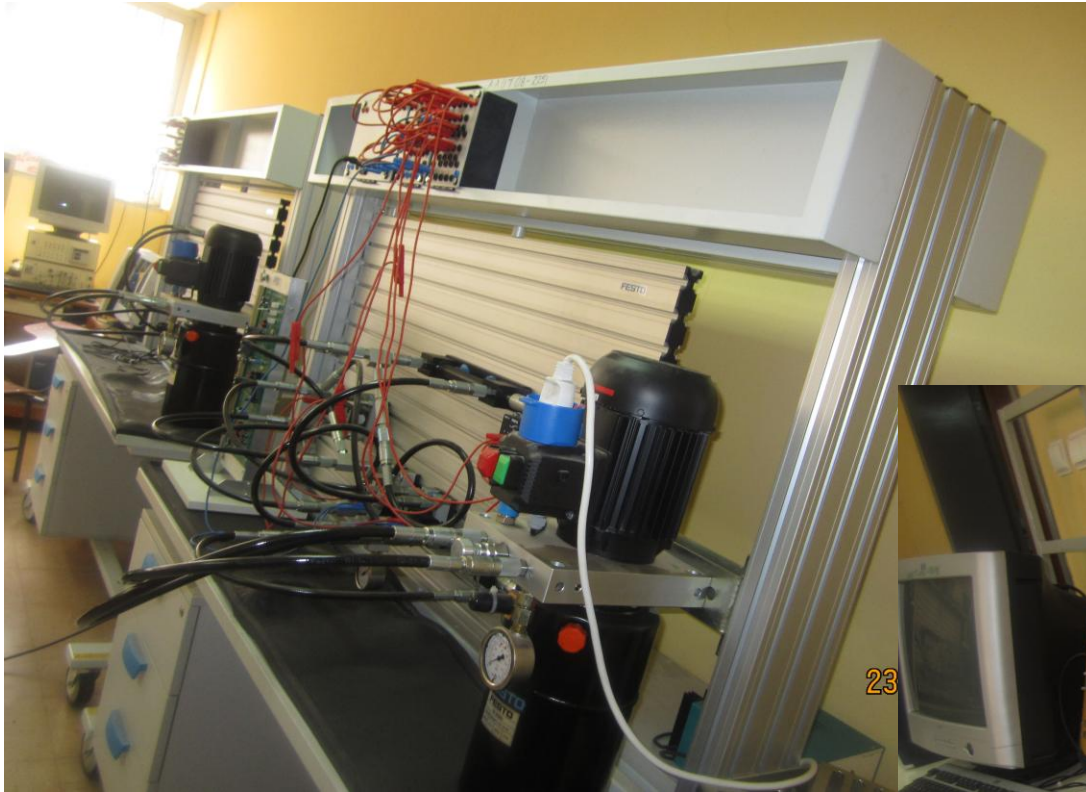
# ECE R&D Laboratories



# ECE R&D Laboratories



# ECE R&D Lab. – Process Control & PLC Trainer



# ECE R&D Lab. - Control & Instrumentation



# High Voltage and Impulse Withstand Test



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# Possible Employment sectors

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- Ethio-telecom, ZTE, Huawei, ....
- Ethiopian Electric Power, Ethiopian Electric Utility, Private power generation sector ...
- Manufacturing industries, automation industries, Electronics manufacturing industries, ...
- Construction sector,
- Transportation sector, Railway, ...
- Private software development companies, Private outsourcing companies, ...
- In addition, several of our students do a **startup company from their thesis** and related works.



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Thank you!

Good Luck with Your Future  
Academic Careers!

*We Cordially Invite you to Join this  
marvelous field of Engineering and  
Enjoy Achievement!*

