COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electronics and Communications Engineering, Cairo

Graduation Project Description Form

Project Title:
Instrumentation and Control of an Educational Cleanroom Mini-Environment for VLSI Fabrication

Project Supervisor(s):

Dr. Amr Bayoumi (EC. Dept., College of Eng., AAST, Cairo)
Dr. Amgad Aly (Architecture Dept., College of Eng., AAST, Cairo)

Duration from mo/year: 2/2013 till mo/year 2/2014

Product Category:

Algorithm____ Hardware X Software_____

Standards:

Safety: UL, CE_____ IEEE _____ FCC _____ Other *Environmental*

Practical Realization Form

PCB X Firmware X Embedded CPU Kit (ARM, ..etc): X____
PC Software _____ Ready-made Package X DSP Kit FPGA Kit X
VLSI Schematics ____ VLSI Layout _____ VLSI Silicon (ASIC)_____
Electronics Assembly: X Control & Automation: X Mechanical Assembly: X

Language

VHDL/Verilog X Matlab X C/C++/Java X

Productization

Finished Product Form: X Possible Commercialization X
Amount of funds needed for buying components: _____
IEEE GOLD Made-In-Egypt/Engineering Day: X
ITAC (ITIDA) or NTRA Funding Application: X

Testing

Functional X Simulation X Parameters X Final Hardware X Other: *Environmental*

Lab Test Setup

EMC _____ Environmental X Microwave _____ Analog Lab_ Other:

CAD Tools *(No unauthentic software is allowed):* Gas Flow, CAD Drawing

Elective Classes Recommended: VLSI Fabrication (EC536)

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Abstract

Instrumentation and Control of an Educational Cleanroom Mini-Environment for VLSI Fabrication

Dr. Amr Bayoumi / Dr. Amgad Ali

Cleanroom environment is essential in several technologies including VLSI integrated circuit fabrication. These cleanrooms use computer control and monitoring of air-conditioning, lighting, dust, particles, temperature, humidity, air flow and fresh air intake, as well as exhaust of any generated fumes.(http://en.wikipedia.org/wiki/Cleanroom)

This project is joint project with AAST Department of Architecture (students from Architecture Dept. will participate), where a full design and drawing for a small mini-environment is conducted. Simulation software is used to simulate all the above mentioned variables.

The Electronics & Comm. Dept. (EC Dept.) role in this project will focus on the measurement, instrumentation, and digital control of air-conditioning, fans, light, temperature, electric power supplies,...etc.

The output of the project will be full design documents and drawings, as well as the electronics for the measurements and control needed.

A small "modular" cleanroom is planned to built at AAST as a result of this project, depending on the progress of the simulation and design drawing.

An example system can be found at:

http://www.terrauniversal.com/cleanrooms/modular-clean-rooms-x.php

http://www.kteccleanrooms.com/Singlewall.html

References and Links

http://en.wikipedia.org/wiki/Cleanroom

http://www.terrauniversal.com/cleanrooms/modular-clean-rooms-x.php

http://www.kteccleanrooms.com/Singlewall.html