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BENT413 Electrical and Electronics Circuit Construction

ECTS Value: 5 ECTS
Self-Study Hours: 64

Contact Hours: 25
Assessment Hours: 36

Overall Objectives and Outcomes

This module starts by giving the student a basic understanding of different electronic boards and their parts such as breadboard; strip board; PCB and bus lines; terminal strips; copper tracks; insulation layer; photo resist layer. It will then continue with the instructions of how to construct a printed circuit board including soldering process from the artwork (with and/or without software); chemical development of PCB; etching of a PCB and populating the PCB with components.

By the end of this module, the learner will be able to:

Competences

a. identify the application of different electronic boards and their parts including but not limited to breadboard; strip board; PCB and bus lines; terminal strips; copper tracks; insulation layer; photo resist layer;
b. master the process including quality control of constructing a printed circuit board including manual and/or software-based tools for circuits artwork; chemical development of PCB, and etching of a PCB;
c. construct, populate and test a PCB for an electrical and electronic circuit including quality control processes.

Knowledge

a. identify the advantages and disadvantages of electronic boards. Electronic boards: breadboard; strip board; PCB;
b. describe the process of constructing a printed circuit board including manual and/or software-based tools for circuits artwork; chemical development of PCB; and etching of a PCB as well as the use of the appropriate PPEs and procedures;
c. interpret the schematic symbols and drawing requirements for PCB manufacturing.

Skills

a. design, manufacture and test a PCB;
b. populate and test a PCB.

Assessment Methods

This module will be assessed through: Research Assignment (50%), Presentation (20%), Practical assignment (30%)

Suggested Readings

Core Reading List:

1. Al Williams, (2004). Build your own printed Circuit Board. McGraw-Hill.
2. Montrose, M.I. (2000) Printed Circuit Board Design Techniques for EMC Compliance: A Handbook for Designers (IEEE Press Series on Electronics Technology). John Wiley and Sons Ltd

Supplementary Reading List:

1. Brindley, K. (2005). Starting Electronics Construction: Techniques, Equipment and Projects. Newnes.

Useful Online Resources

1. PCB Design Tutorial - http://alternatezone.com/electronics/pcbdesign.htm
2. National Instruments Circuit Design Suite - http://www.ni.com/multisim
3. The Electronics Club - http://electronicsclub.info

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