

Engineering Program

Specialty	Medical Equipment Technology
Course Number	020406261
Course Title	Electronic workshop
Credit Hours	2
Theoretical Hours	0
Practical Hours	6

Brief Course Description:

- Student should acquire theoretical knowledge about troubleshooting electronic circuits and components, troubleshooting relays and electromechanical components, troubleshooting electronic motors, power supply components and troubleshooting, board level troubleshooting.

Course Objectives:

Upon the completion of the course, the student will be able to:

- Basic troubleshooting methods
- Troubleshooting relays & other electromechanical component
- Troubleshooting electronic motors
- Introduction to power supply components
- Troubleshooting power supply problems
- Board-level troubleshooting

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1	Basic troubleshooting methods	<ul style="list-style-type: none"> • Survey the environment • Understanding failure modes • The half-step method • Open circuit • Circuit loading • Shorted circuits 	
2	Troubleshooting relays & other electromechanical component	<ul style="list-style-type: none"> • Device identification and pictorial diagram of electromechanical devices • Relays • Solenoids • Failure modes and repair of electromechanical components 	
3	Troubleshooting electronic motors	<ul style="list-style-type: none"> • Introduction to electromagnetic principles • Introduction to DC motors • Introduction to AC motors • Single-phase AC motors • Failure modes and repair of electric motors. 	
4	Introduction to power supply components	<ul style="list-style-type: none"> • Power supply block diagram • Transformers • Rectifier and semiconductors • Diodes-electrical “one- way valves” • AC to DC rectification • Filtering • Bipolar and field effect transistors • Metal oxide semiconductor field effect transistors 	
5	Troubleshooting power supply problems	<ul style="list-style-type: none"> • Power supply block diagram review 	

6	Board-level troubleshooting	<ul style="list-style-type: none"> • Historical device repair perspective • The concept of board-level troubleshooting • Isolating device repair problems • The decision-making process: when to repair the board 	
---	-----------------------------	---	--

Evaluation Strategies:

Exams		Percentage	Date
Exams	Med-Term Exam	30%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		20%	--/--/----

Teaching Methodology:

- ❖ Workshops-Modules and kits

Text Books :

Basic electronic troubleshooting for biomedical technicians, Nicholas Cram, Selby Holder, 2nd edition