AVIT AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY

VINAYAKA MISSION'S RESEARCH FOUNDATION
(Deemed to be University under section 3 of the UGC Act 1956)

Accredited by NAAC

Approved by AICTE

DEPARTMENT OF BIOMEDICAL ENGINEERING

DIAGNOSTIC AND THERAPEUTIC EQUIPMENT LAB

STANDARD OPERATING PROCEDURE

Name of the Lab	Diagnostic and Therapeutic Equipment Lab
Purpose	To obtain the ECG Waveform of the Subject and view the same using DSO and understand the working methodology of various modules.
Scope	Acquisition of Electro Cardio Gram.
Responsibility	Faculty In Charge of the Lab – Monitoring if the students are following the SOP & recommending revisions wherever needed

STANDARD OPERATING PROCEDURE FOR ECG TRAINER KIT

This section should describe how to use the device ECG Trainer Kit

- Connect the instrument to the mains.
- Instrument ON by mains Switch, the switch will be lighted.
- Connect the DSO to the instrument.
- Connect the electrodes to system and Select the required Lead by selector switch.
- Now clean the skin where the electrode connects & apply small amount of conductive gel on electrodes and connect the electrodes to human body or ECG simulator.
- Now vary the Gain knob of amplifier or Voltage / Div knob of DSO as per requirement, also vary Time / Div as per requirement.
- Now change position of lead selector switch & see the output or on the test point.
- If any noise is found on DSO, check the Ground. If Ground or electrodes are not proper the signal gets distorted.

PRECAUTIONS TO BE FOLLOWED

- The handling of patient electrodes and the controls of this instrument must always be entrusted only to qualified biomedical person.
- ECG amplifier is a very sensitive electronic instrument. The quality signals are easily affected by the use of unclean badly connected or improperly placed electrodes. Electrodes must also be cleaned out with water and soap after each use.
- The instrument should be protected from damage due to accidental spray from liquids. If liquid spilled over the instrument, they will short circuit or damage components and other surfaces.

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DIAGNOSTIC AND THERAPEUTIC EQUIPMENT LAB

STANDARD OPERATING PROCEDURE

Name of the Lab	Diagnostic and Therapeutic Equipment Lab
Purpose	To obtain the EEG Waveform of the Subject and view the same using DSO and understand the working methodology of various modules.
Scope	Acquisition of Electro Encephalo Gram.
Responsibility	Faculty In Charge of the Lab – Monitoring if the students are following the SOP & recommending revisions wherever needed.

STANDARD OPERATING PROCEDURE FOR EEG ELECTRODE

- Connect the instrument to the mains.
- Instrument ON by mains Switch, the switch will be lighted.
- Connect the DSO to the instrument.
- Connect the electrodes to system and Select the required Lead by selector switch.
- Connect the electrodes to system, Put Mode switch at Left position &Left channel selector Switch at No 1 position.
- Clean the skin where the electrode place & apply small amount of conductive gel or use disposable electrodes.
- Now connect the electrodes and acquire the signal on the DSO and make eyes activity up or down, left or right.
- Now vary the Gain knob of amplifier or Voltage / Div knob of DSO as per requirement, also vary Time / Div as per requirement.
- If any noise is found on DSO, check the Ground. If Ground or electrodes are not proper the signal gets distorted.

PRECAUTIONS:

- The handling of patient electrodes and the controls of this instrument must always be entrusted only to qualified biomedical person.
- EEG amplifier is a very sensitive electronic instrument. The quality signals are easily affected by the use of unclean badly connected or improperly placed electrodes. Electrodes must also be cleaned out with water and soap after each use.
- The instrument should be protected from damage due to accidental spray from liquids. Protect instrument from fluids and if spilled over the instrument, they will short circuit or damage components and other surfaces.
- Do not use damaged power cord, Electrodes, connector & other peripherals.

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DIAGNOSTIC AND THERAPEUTIC EQUIPMENT LAB

STANDARD OPERATING PROCEDURE

Name of the Lab	Diagnostic and Therapeutic Equipment Lab
Purpose	To obtain the EMG Waveform of the Subject and view the same using DSO and understand the working methodology of various modules.
Scope	Acquisition of Electro MyoGram.
Responsibility	Faculty In Charge of the Lab – Monitoring if the students are following the SOP & recommending revisions wherever needed

STANDARD OPERATING PROCEDURE FOR EMG TRAINER KIT

- Connect the instrument to the mains.
- Instrument ON by mains Switch, the switch will be lighted.
- Connect the DSO to the instrument.
- Connect the electrodes to system.
- Clean the skin where the electrode place & apply small amount of conductive gel or use disposable electrodes.
- Now connect the electrodes and acquire the signal on the DSO and make some muscle activity voluntarily or by external stimulations.
- Now vary the Gain knob of amplifier or Voltage / Div knob of DSO as per requirement, also vary Time / Div as per requirement.
- If any noise is found on DSO, check the Ground. If Ground or electrodes are not proper the signal gets distorted.

PRECAUTIONS:

- The handling of patient electrodes and the controls of this instrument must always be entrusted only to qualified biomedical person.
- EMG amplifier is a very sensitive electronic instrument. The quality signals are easily affected by the use of unclean badly connected or improperly placed electrodes. Electrodes must also be cleaned out with water and soap after each use.
- The instrument should be protected from damage due to accidental spray from liquids. If liquid spilled over the instrument, they will short circuit or damage components and other surfaces.

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DIAGNOSTIC AND THERAPEUTIC EQUIPMENT LAB

STANDARD OPERATING PROCEDURE

Name of the Lab	Diagnostic and Therapeutic Equipment Lab
Purpose	To understand the working principle of FM Modulation, Transmission, Receiving and Demodulation of Bio signal in a modular way.
Scope	Transmit and Receive a Bio Signal using Frequency Modulation.
Responsibility	Faculty In Charge of the Lab – Monitoring if the students are following the SOP & recommending revisions wherever needed

STANDARD OPERATING PROCEDURE FOR BIO TELEMETRY KIT

- Connect various modules of the equipment as instructed.
- Switch ON the battery power supply. The current monitor terminals in the front panel of the battery unit should be shorted using the jumper wire.
- Connect the DSO to the instrument.
- Connect the electrodes to system.
- Now clean the skin where the electrode connects & apply small amount of conductive gel on electrodes and connect the electrodes to human body or ECG simulator.
- Now vary the Gain knob of amplifier or Voltage / Div knob of DSO as per requirement, also vary Time / Div as per requirement.
- The transmitted ECG/Pulse signal can be received by FM receiver module on the receiver side, the received ECG/Pulse signal can be viewed from the output of FM Demodulator.

PRECAUTIONS:

- The handling of the controls of this instrument must always be entrusted only to qualified biomedical person.
- Biotelemetry Kit is a very sensitive electronic instrument. Accessories must also be cleaned out after each use.

  The instrument should be protected from damage due to accidental spray from liquids. If liquid spilled over the instrument, they will short circuit or damage components and other surfaces.

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DIAGNOSTIC AND THERAPEUTIC EQUIPMENT LAB

STANDARD OPERATING PROCEDURE

Name of the Lab	Diagnostic and Therapeutic Equipment Lab
Purpose	To study the Cut and Coaaguation modes using ESU Machine
Scope	Various types of ESU and thier modes are analyzed.
Responsibility	Faculty In Charge of the Lab – Monitoring if the students are following the SOP & recommending revisions wherever needed

STANDARD OPERATING PROCEDURE FOR ELECTRO SURGICAL UNIT

- Connect various electrodes and patient plate to the device.
- Switch ON the instrument and wait for the instrument to get ready after completing the self test.
- Set the Modes and the frequency.
- Now clean the skin where the electrode connects & apply small amount of conductive gel (if required) on electrodes and carefully Cut or coagulate the skin.
- Repeat the above procedures for different cut mode and coagulation modes.

PRECAUTIONS:

- The handling of patient electrodes and the controls of this instrument must always be entrusted only to qualified biomedical person.
- The skin should be free of skin lotion, blood, prep solution and debris prior to applying the electrodes.
- The electrodes must be applied to skin that is dry and clean to assure complete contact with the skin.
- Hair should be removed from the electrodes site of placement if it is determined it will interfere with full contact with the skin of the patient.
- Using the correct size promotes complete contact of the electrodes with the patient's skin in order to complete the circuit and decreases the size of the current.
- The single-use electrodes should only be used once and properly discarded.
- Do not use damaged power cord, Electrodes, connector & other peripherals.

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DEPARTMENT OF BIOMEDICAL ENGINEERING

DIAGNOSTIC AND THERAPEUTIC EQUIPMENT LAB

STANDARD OPERATING PROCEDURE

Name of the Lab	Diagnostic and Therapeutic Equipment Lab
Name of the Equipment	Vascular Doppler
Purpose	To Measure the Pulse rate from the blood flow at the periphery by means of Ultrasonic transducer.
Scope	Measure the Heart rate and understand the intensity of blood flow.
Responsibility	Faculty Incharge of the Facility, HOD/BME

STANDARD OPERATING PROCEDURE:

- Connect the Batteries to the devices according the position as instructed.
- Use the Side rotating Knob to switch on the machine.
- Clean the surface where the blood flow is to be detected and apply some conductive gel to the surface.
- Place the transducer over the conductive gel and obtain the audible signal of the blood flow in the periphery of the subject.
- Repeat the procedure in various sites and various conditions of the patient.

PRECAUTIONS:

- The handling of transducer and the controls of this instrument must always be entrusted only to qualified biomedical person.
- The quality signals are easily affected by the use of unclean badly connected or improperly placed transducer. Transducer must also be cleaned out after each use.
- The instrument should be protected from damage due to accidental spray from liquids. Protect instrument from fluids and if spilled over the instrument, they will short circuit or damage components and other surfaces.

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