WS Code: RPW2
Title: Radiation Detection, Calibration and Dosimetry
Scientific Track: Radiation Protection
Chair: Mehenna Arib, PhD
Date & Time: Thursday 17 February 2022, 13:00 – 15:30
Venue: Virtual

Part1: Radiation Detection and measurement

Coordinator: Mr. Omar Noor, Pager: 43348

Workshop Faculty: Alhanouf Aldosari

Time : 13:00 – 13:30

Target Audience:

Radiation safety officers, Health and medical physicists, Nuclear medicine and medical imaging professionals and Radiologic technologists and radiologists

Workshop Description:

Participants in this workshop will gain practical experience in the daily operational tasks of a Radiation Safety Officer. In particular, participants will learn about;

- Choosing the right instrument for a particular application
- Getting Familiar with instruments i.e. dead time, efficiency, range…etc
- Surveying frequency and methodology
- Criteria for designating a controlled area vs supervised areas
- Record Keeping and Documentation

Learning Objectives:

- Acquire the knowledge on basic concepts and principles of radiation detection and measurements
- Gain a clear understanding, skill and attitude on daily applications on radiation protection practices

Part2: Calibration of radiation protection instruments

Coordinator: Mehenna Arib, PhD, Pager: 45035

Workshop Faculty: Heba Alhumaidan, Hesham Alhamdan

Time : 13:30 – 14:00

Target Audience: Radiation safety officers, Health and medical physicists, Nuclear medicine and medical imaging professionals and Radiologic technologists and radiologists

Workshop Description:

The workshop is intended to give an overview on the procedures applied at the KFSHRC Secondary Standard Dosimetry Laboratory for calibrating Radiation protection measuring instruments such as Survey-meters, personal dosimeters and contamination meters. The hands-on practical session will cover the following procedures:

- Description of the Secondary Standard Dosimetry Laboratory and its calibration facilities
- Video presentation of the facility and practical virtual session on how to perform calibration
- Presentation of the Calibration software and calculation of the reference ambient dose equivalent frates Presentation of the procedure for the calibration of the contamination monitors using Cl-36, Sr-90 and TC-99 reference sources
- Establishment of calibration certificates

Learning Objectives:

Upon completion of this workshop, attendees should be able to understand the radiation protection calibration procedure applied at the SSDL. The workshop will allow them to improve their knowledge about how to use a calibrated instrument and apply the calibration factor to mesure the dose rate at the workplace.

Part3: Personal Dosimetry

Coordinator: Ibrahim Algain, MSc, Pager: 49736

Workshop Faculty: Shaima Al-Shora, Noor Aledan

Time : 14:00 – 14:30

Target Audience: Health Physicists, RSOs, Dosimetrists

Workshop Description:

The workshop is intended to show the attendees the procedures applied at the KFSHRC Personal dosimetry Laboratory for the personal dose monitoring using Thermoluminescent Dosimeters and Bioassy Monitoring using NaI detecror. The hands-on practical session will cover the following procedures:

- Handling the dosimeters (reception and sending)
- Issuance of new TLDs (New Clients)
- Daily Checks for the Tld Reader
- Calculation of the Element correction coefficient (ECC) for each TLD ship
- Calibration of the TLD Reader
- Evaluating the dosimeters using the TLD reader
- Recording and interpreting the TLD results in terms of personal dose equivalent
- Establishment of ALARA levels
- following up and investigating doses above ALRA limits
- Issuance of dose evaluation reports
- Setup and calibration of the Bioassay monitoring unit
- Frequency of monitoring
- Bioassay measurement, interpretation of results
- Issuance of evaluation report

Learning Objectives:

This workshop will allow the attendees to understand the principles of dose measurement using Thermoluminescent dosimeters and a Bioassay NaI monitoring Unit. They will have the opportunity to handle the dosimeters, the TLD readers and to NaI detector.

Part4: High Dose Dosimetry

Coordinator: Eng. Akram Al Mousa, MSc, Pager: 45647

Workshop Faculty: Saad Bin Jamaan, Jonathan Antonio.

Time : 14:30 – 15:00

Target Audience: Dosimetrists**,** Physicists, Health Physicists.

Workshop Description:

The workshop is intended to show the attendees, through a video presentation, the procedures applied at the KFSHRC high dose dosimetry Laboratory for the high doses measurement using Fricke solution reference Dosimeter, calibration of the high dose routine dosimeters (Red Perspex dosimeter) and using it as routine dosimeter in high dose fields such as calibrating gamma cells units that are used in universities and scientific institutes to irradiate samples. The workshop will include a video presentation of the KFSH&RC gamma irradiation facility and experience the Cherenkov radiation emitted from Cobalt-60 radioactive sources in the storage pool. The virtual presentation will briefly cover the following procedures:

- Choosing the hot spot point to be used for calibration.
- Preparation of Fricke reference dosimeter solution.
- Reading the pre-irradiation samples using spectrophotometer.
- Irradiation the Fricke reference dosimeter solution samples at the reference hot spot point in gamma irradiation facility.
- Reading the post-irradiation samples using spectrophotometer.
- Calculating the dose rate at the reference hot spot point.
- Irradiation of Red Perspex dosimeters at the reference hot spot point.
- Reading the irradiated Red Perspex dosimeters using the spectrophotometer.
- Drawing the calibration curve for Red Perspex dosimeters.
- Using the Red Perspex dosimeters in calibrating the gamma cells and as routine dosimeter.
- Issuance of calibration report.

Learning Objectives:

This workshop will allow the attendees to understand the principles of high dose dosimetry using Fricke solution reference dosimeter, and how to calibrate any routine dosimeter against the reference dosimeter. They will have the opportunity to see how to handle the dosimeters, the spectrophotometer instrument and learn about KFSH&RC gamma irradiation facility and experience the Cherenkov radiation emitted from Cobalt-60 radioactive sources through the video presentation.