



More Progress Toward a Graduate Certificate Program in Radiation Protection

A Report to the USTUR Scientific
Advisory Committee

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Gas-filled Geiger-Muller
Pancake Detector

NaI Solid Scintillation Detector

Detector Meter



Outline

- 4th year funding is here
- First revised course is being taught
- Faculty Senate status
- Course development work
- Instrumentation purchased and planned

4th Year Funding

- Hooray, it is here
- We were allowed to carry over last year unused funds

(Gist of recruitment flyer)

Environmental Science and Science Students

Sign-up now for

New Fall

Semester Course

**to enhance your knowledge
and career options**

**ES/RP 492/592, Special Topics
in Radiological Science**

provides a foundation of
concepts and explores current
issues involving radiation and
radioactivity

**ENROLL NOW TO BE CONSIDERED
FOR SCHOLARSHIP SUPPORT FOR
THIS COURSE.**

M/W, 4:15-5:30 p.m. Talk to your
Academic Advisor or call 372-7606



- A review of classical and modern physics concepts needed to study radiation, radioactive material, the effects of radiation (including hazards), and the uses of radiation and radioactive material
- How the structure of matter causes radiation and radioactivity
- Radiation chemistry and molecular effects of radiation
- How radiation interacts with matter
- How radiation is detected and measured
- Where radiation and radioactive material, man-made and natural, exist and; how they behave in the environment
- Biological effects of radiation on cells, organs, and organisms; now and in the future
- Managing the effects of radiation exposure as a public health problem—philosophy and risk assessment
- How radiation dose limits are set and enforced
- The “10 Principles and 10 Commandments of Radiation Protection”
- How non-ionizing radiation is different from ionizing radiation and how ubiquitous it is

Faculty Senate Status

Approval of the certificate program and the courses that comprise it is expected very soon

- Allan Felsot, the professor who coordinates rooms and schedules for science courses, is tracking the progress of the approval paperwork
- Last spring, we responded to a request for more info from the graduate school

Course Development

- Dan Strom has been tasked with developing a glossary and style guide that will be used by all instructors in the certificate program
- Dan Strom has been tasked with revising the materials for the ENVR_SCI 406 Introduction to Radiological Science to make the 2-credit course a 3-credit course
- Bruce Napier has completed the task of developing detailed learning objectives, assessment measures, and other materials for the environmental dosimetry half of the environmental and internal dosimetry course
- Dan Strom has been tasked with developing detailed learning objectives, assessment measures, and other materials for the internal dosimetry half of the environmental and internal dosimetry course

Course Development (cont)

- Remote delivery course development will start this year
 - DOE client is quite pleased with our intent
 - Quick look shows that elements of the certificate program will meet many, if not all, of the “Tech Quals” for DOE radiation protection and RP management positions
- 2 likely courses to start with
 - Introduction to Radiological Science
 - Environmental and Internal Dosimetry

Procured Equipment

Alpha Spectrometers

4 Alpha Spectrometers

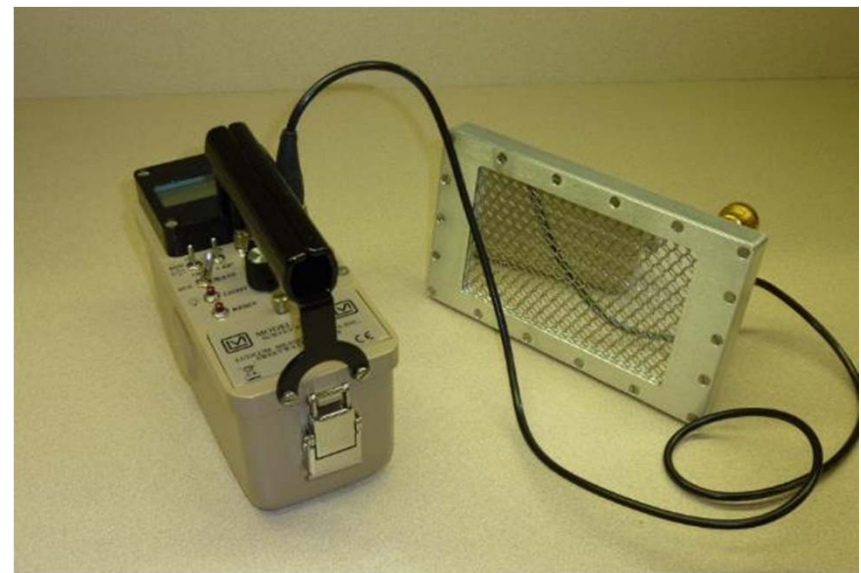
- Same brand and model as those used at USTUR
- Will be housed in USTUR labs
- 1 or 2 weeks a year, students will visit USTUR for lab work
- The other 50 weeks USTUR will use the spectrometers for their work



Procured (cont)

Ludlum Counting Instruments

- 4 Ludlum 2241-3's
- With
 - 4 pancake GMs
 - 4 1" x 1" NaI's
 - 4 energy comp GMs
 - 4 YSO scintillators
 - 3 gas proportional
 - 2 3" x 3" NaI's
- Along with 1 PC & 3 laptops to adjust internal gain and discriminator settings



Procured (cont)

Ludlum Pressurized Ion Chambers

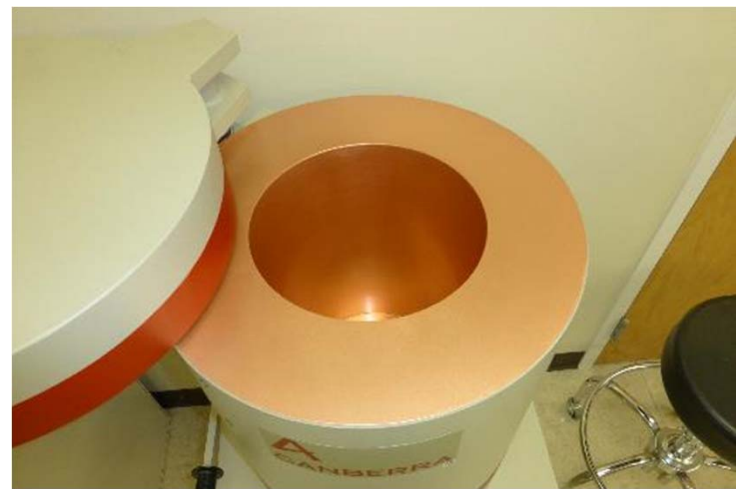
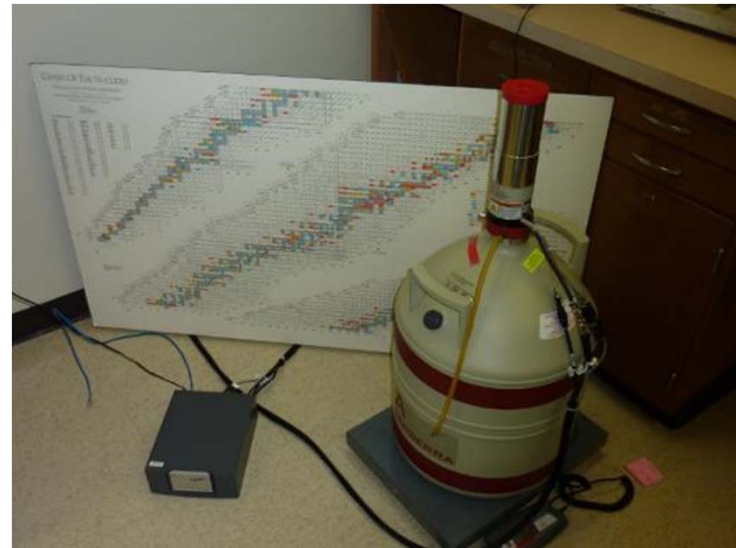
- 2 PIC calibrated to measure exposure
- 2 to measure ICRU “ambient dose”
- Ancillary chargers, headphones, alkaline battery pack
- “Dimension” PC interface software



Procured (cont)

Gamma Spectrometry

- Intrinsic germanium spectrometer
- Canberra, 20%, with
 - standard dewar
- Lynx MCA
 - Especially designed for teaching
- 4" Pb shield
 - Sn & Cu liner
 - Steel table (1 ton shield)
- Gamma calibration sources



Procured (cont)

Air Samplers

- To sample for Rn progeny
- 2 Staplex HI-vol
 - 4" samples
 - w/tripods
- 2 Hi-Q
 - 47 mm samples
 - w/tripods



Procured (cont)

Non-ionizing Radiation

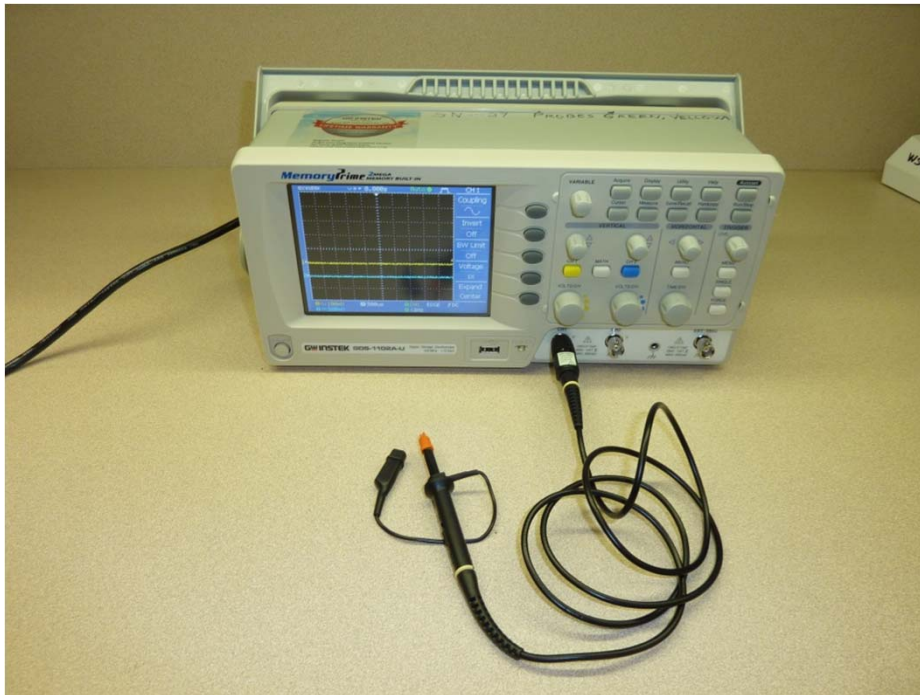
- Laser power probe w/meter and PC interface
- ELF Meter
 - ETS-Lindgren
 - w/dielectric tripod
 - w/remote readout and fiber optic interface



Procured (Miscellaneous Equipment)

Scopes (2)

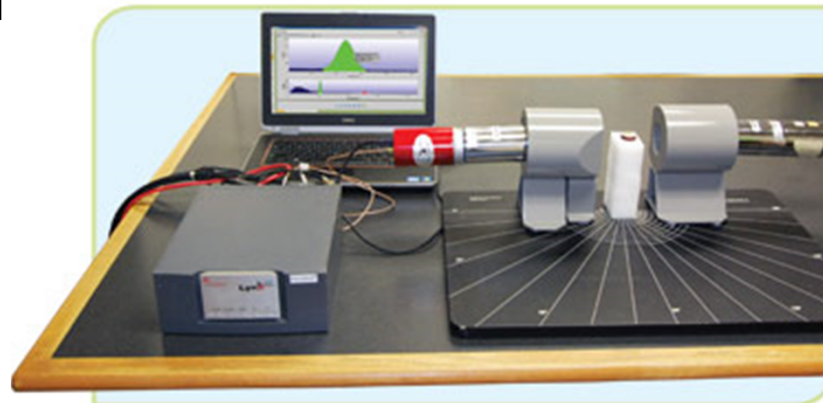
Tools



- Hand tools
- Drill
- Saber Saw
- Electronic
- Nuts and bolts, ties, hose clamps/

Procurement Planned

- Hybrid cryostat for gamma spectrometer (Stirling cooler to recycle LN)
- Landauer Microstar™ Kit
 - For OSL dosimeters, the successor to TLDs
 - PNNL is willing to irradiate dosimeters
 - Steve Miller and Joe McDonald (PNNL inventors of OSL) are willing to help
- Canberra “LabKit”
 - Enables 12 lab experiments for measurements of gamma nature of the digital



Procurement Issues

- The Canberra digital “labkit” requires a non-exempt source
- Trouble finding a “microwave test bench”
- Incomplete w/o liquid scintillation counter
 - LSC is quite expensive
 - Students handling unencapsulated sources is a “no-no”
 - Getting a donated LSC counter from DOE would be difficult
- Additional space needed to teach radiation instrumentation course

Timeline

Fall 2014	Introductory course taught under a special studies number (ENVR_SCI 492/592) Development of distance learning Recruitment, recruitment, recruitment Admit students to the certificate program
Spring 2015	Offer the Intro course again
Fall 2015	Offer Radiation Instrumentation Offer Environmental and Internal Dosimetry, locally and via distance