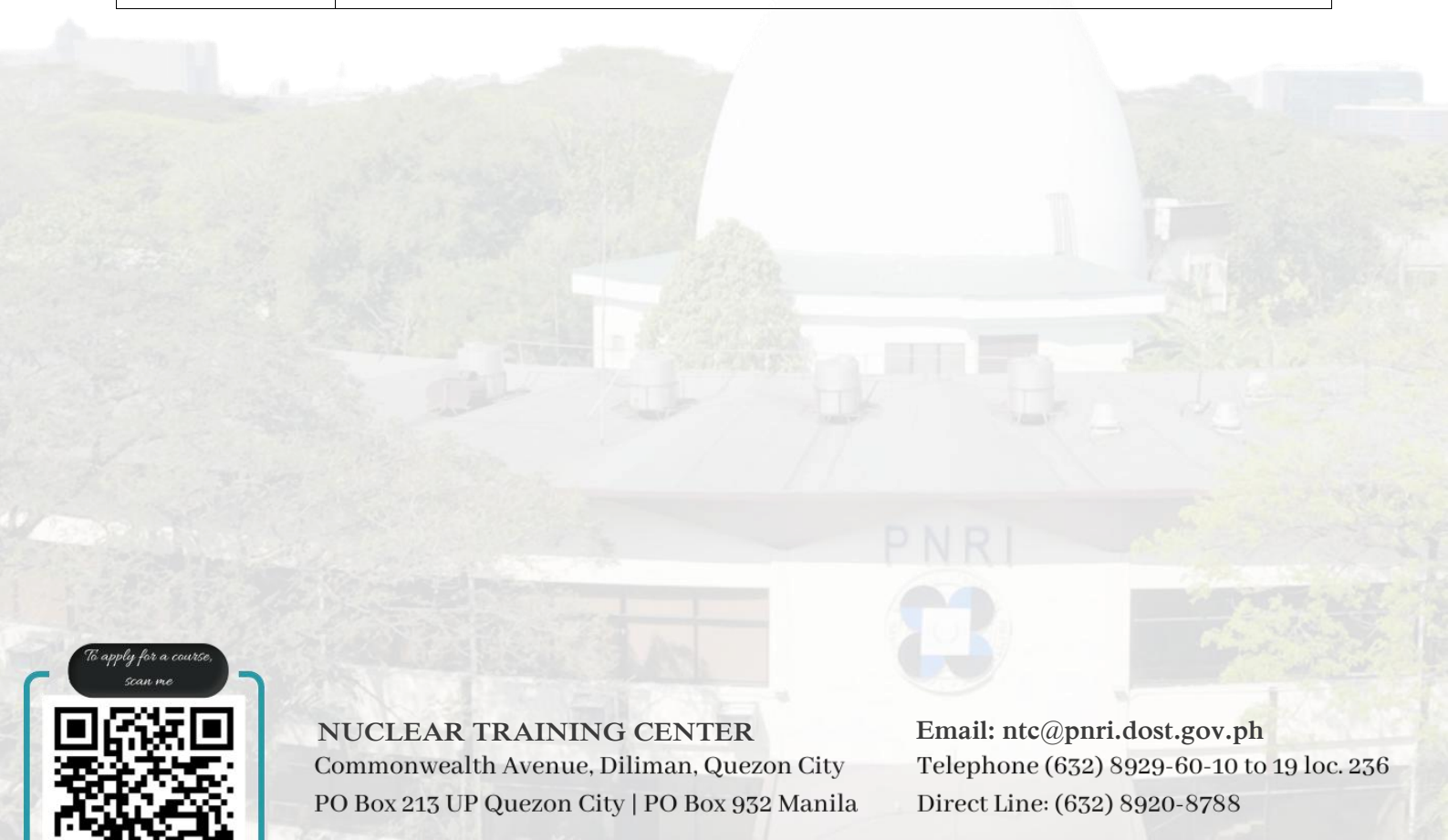




Course Title	Course on Basic Neutron Science (CBNS)
Duration	Face-to-Face: 10 days (80 hours)
Target Participant	This course is designed for incoming senior undergraduate students pursuing physics, engineering, or related fields. A minimum of ten (10) participants is required for the course to proceed, with a maximum of thirty (30) participants accepted.
Pre-requisite	Participants should have a background in the following subjects: - Algebra, Trigonometry, Calculus, and Differential Equations - Chemistry and Electronics - Newtonian Mechanics, Thermodynamics, and Statistical Physics - Modern Physics and Material Science
Goal	To equip participants with a sufficient level of understanding of key concepts and skills in the following areas: 1. Basic radiation and radioactivity principles 2. Nuclear instrumentation 3. Neutron-induced nuclear reactions 4. Neutron moderation and shielding 5. Neutron flux and dose measurements 6. Modeling and simulation of neutron radiation transport 7. Applications of neutron science across various fields.
Objectives	Upon completion of the course, participants will be able to: 1. Describe atomic and nuclear structures and explain the occurrence of radioactivity. 2. Understand radiation interactions with matter and their underlying mechanisms. 3. Demonstrate familiarity with radiation detection and measurement instrumentation. 4. Utilize different detectors to measure photon and neutron radiation. 5. Explain neutron properties and their interaction mechanisms with matter. 6. Analyze neutron behavior through measurements and calculations. 7. Understand accelerator-based neutron sources and nuclear reactor technologies.
Nature and Scope	This course combines lectures, exercises, case studies, and examinations, delivered by experts from the Nuclear Training Center (NTC), PNRI lecturers, scientists, and technologists. Participants' understanding and proficiency will be evaluated through: 1. Examinations (55%) 2. Case Study Development & Presentation (30%) 3. Laboratory Experiments & Practical Exercises (10%) 4. Attendance (5%) Successful participants who demonstrate satisfactory knowledge and skills in the subject matter will receive a Certificate of Completion .
Application Requirements	Applicants must submit the following: 1. NTC Online Course Application 2. Recommendation Letter from their Department Chair 3. Certified true copy of grades or transcript of records 4. One 2x2 ID picture



Course Content	<p>Lectures:</p> <ol style="list-style-type: none"> 1. Atomic Structure and Radioactivity 2. Interaction of Radiation with Matter 3. Introduction to Radiation Protection 4. Basic Radiation Detection and Instrumentation 5. Statistics of Counting 6. Introduction to Gamma Spectrometry Using NaI and HPGe Detectors 7. Basic Nuclear Physics 8. Nuclear Reactions 9. Basic Neutron Physics 10. Active Neutron Detectors 11. Neutron Detection by Activation 12. Neutron Flux and Dose Measurement 13. Introduction to Calculation Methods 14. Introduction to Accelerator-Based Neutron Sources and Their Applications 15. Introduction to Nuclear Reactor Technology <p>Experiments:</p> <ol style="list-style-type: none"> 1. Nuclear Instrumentation 2. Gamma Spectrometry Using NaI and High-Purity Germanium Detectors 3. Determination of Naturally Occurring Radioactive Materials (NORMs) in Food and Environmental Samples 4. Neutron Detection Using Gas-Filled Detectors (BF3 and He-3) 5. Neutron Flux Measurement Using Activation Detectors 6. Neutron Dose Measurement Using Rem Ball and Proton Recoil Scintillator <p>Other Activities:</p> <ol style="list-style-type: none"> 1. Case Study Development and Presentation 2. Guided Tour of PNRI Facilities
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To apply for a course,
 scan me



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