Course Title	**Follow-up Training Course on Reactor Engineering Level 1 (FTC-RE 1)**
Duration	10 days (40 hours); 8:00 – 5:00 pm
Target Participant	This course is open to scientists, engineers, lecturers, and other interested professionals who have technical degrees in any of the physical sciences, mathematics, or engineering. The course is limited to 20 participants and will be reserved on a "first-come, first-served" basis.
Pre-requisite	As a foundational course, modest background on the following topics is assumed: Newtonian mechanics, Thermodynamics, Material Science, Algebra, Differential and Integral Calculus, Ordinary and Partial Differential equations, and Modern Physics.
Goal	The goal of this course is to provide a foundation for understanding the scientific principles that are associated with various nuclear reactor facilities. This basic knowledge on the numerous scientific and engineering disciplines involved in an operating nuclear reactor will help the participants more fully understand the basis of the safe and effective utilization of nuclear energy. This course will prepare the participants in understanding advanced theoretical concepts presented in higher level reactor engineering courses and is in line with PNRI's human resource development program.
Objectives	At the end of this course, participants are expected: 1. To gain basic knowledge on ionizing radiation and describe its interaction with matter 2. To describe the mechanisms for detection of and protection against ionizing radiation 3. To gain basic understanding of nuclear physics and reactor theory 4. To be familiar with the design and functional considerations of existing reactor technologies in the world 5. To understand reactor operation aspect of reactor theory and physical mechanisms involved in reactor control 6. To become acquainted with the processes involved in the lifetime of nuclear fuel resources 7. To learn the structure and design of nuclear fuel 8. To gain basic understanding of nuclear reactor thermal hydraulics, and reactor thermal system 9. To become oriented with nuclear reactor safety, nuclear safety regulations, and safety culture 10. To gain practical insight on theoretical concepts through facility visits and performance of experiments and exercises.
Nature and Scope	The training course consists of lectures, experiments, technical visits, and practical exercises and is presented with a conceptual approach. Participants' understanding of the materials presented will be assessed through the submission of experiment reports. In addition, pre-test and post-test will be given at the beginning and at the end of the course.

Requirements	(1) NTC Online Course Application; (2) Recommendation letter from the university, institution, or company where applicant is employed or enrolled. (3) Medical Certificate; (4) 2x2 ID picture;
Course Content	1. Applications of research reactors 2. Atomic and nuclear physics 3. Fundamentals of nuclear energy 4. Interaction of Radiation with matter 5. Nuclear fuel cycle 6. Nuclear fuel engineering 7. Nuclear reactor calculation 8. Nuclear reactor thermal hydraulics 9. Nuclear safety 10. Overview of nuclear reactors and reactor technology 11. Radiation detection and measurement 12. Radiation physics 13. Radiation Shielding 14. Radiation protection 15. Reactivity control of nuclear reactors 16. Reactor kinetics 17. Reactor physics 18. Research Reactor Simulator 19. Regulatory infrastructure for nuclear power plants 20. Thermal engineering
Activities/ Exercises/ Experiments:	1. Calculation exercise on elementary solution for diffusion equation on simplified systems 2. Experiments with neutron source: neutron flux measurement, neutron moderation, and neutron activation 3. Nuclear reactor calculation: Reactor core calculation using particle transport code based on Monte Carlo method 4. Radiation detection and measurement: time-distance -shielding principle 5. Research reactor simulator: approach to criticality experiment, control rod worth calibration, reactor thermal power calibration 6. Tour of PNRI facilities 7. Technical visit to Bataan Nuclear PowerPlant (BNPP)-Tentative
Reference Materials	1. Turner, J.E. (2007). Atoms, Radiation and Radiation Protection (3rded.). Weinheim:Wiley-VCH 2. Lamarsh, J.R. (2001). Introduction to Nuclear Engineering (3rd ed.). New Jersey:Prentice-Hall 3. Lamarsh, J.R. (2002). Introduction to Nuclear Reactor Theory. American Nuclear Society 4. Duderstadt, J.J. and Hamilton, L.J. (1976). Nuclear Reactor Analysis. John Wiley & Sons, Inc. 5. U.S. Department of Energy. Fundamentals Handbook: Nuclear Physics and Reactor Theory 6. Materials from the JAEA Instructor Training Course (ITC) for Reactor Engineering 7. Lecture presentations

To apply for a course, scan me

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