

Day One	Description	Objectives
07:30 – 08:00 AM	Continental Breakfast	
08:00 – 08:15	Seminar Objectives/Overview	Explain seminar objectives and meet trainers.
08:15 – 08:40	Radiation and Its Uses (Chapter 1) <ul style="list-style-type: none"> • Ionizing radiation and radioactive decay • Contemporary applications 	Identify common applications of ionizing radiation in industry, research and medicine.
08:40 – 09:00	Regulatory Agencies and Licensing (Chapter 2) <ul style="list-style-type: none"> • Where regulatory standards come from • NRC vs. Agreement States • Other agencies (e.g., OSHA, FDA, EPA, DOT) 	Relate how the NRC regulations are developed. Define difference between Agreement vs. Non-Agreement states. Recognize how other agencies regulate radiation.
09:00 – 09:10	Break	
09:10 – 10:00	Math Review (Chapter 4) <ul style="list-style-type: none"> • Basic mathematical functions (algebra, exponents, logarithms, unit conversions) • Counting statistics • Common health physics applications 	Describe basic functions involving exponents, logarithms, conversion factors, etc. Apply math functions used in common health physics applications (e.g., efficiencies, inverse square law, decay, attenuation, specific activity)
10:00 – 10:10	Break	
10:10 – 11:30	Radiation Physics (Chapter 5) <ul style="list-style-type: none"> • Atomic composition, structure, and terms • Radioactive decay and half-life • Properties of common decay products 	Relate the basic atomic structure and components (protons, neutrons, and electrons), and common terms. Define half-life and radioactive decay. Describe basic properties of particulate (alpha, beta) and electromagnetic (x-ray, gamma) decay products.
11:30 – 12:45 PM	Lunch	
12:45 – 02:50 (10 min break)	Radiation Physics (Chapter 5), continued <ul style="list-style-type: none"> • Radioactive decay modes and schemes • Interactions with matter 	Recognize the basic decay modes and characteristics for alpha, beta, x- and gamma emissions. Compare interaction mechanisms (directly vs. indirectly ionizing).
02:50 – 03:00	Break	
03:00 – 04:00	Group Sessions	See group objectives

Day Two	Description	Objectives
07:30 – 08:00 AM	Continental Breakfast	
08:00 – 08:30	Radiation Units (Chapter 6) <ul style="list-style-type: none"> • Exposure units • Dose and dose equivalent units • Energy transfer (LET, QF) 	Identify the difference between exposure and dose. Relate the traditional and SI units for exposure (R C/kg), dose (rad, Gy), and dose equivalent (rem, Sv). Examine linear energy transfer and quality factors as these pertain to biological effectiveness.
08:30 – 10:20 (10 min. break)	Radiation Detection and Measurement (Chapter 10) <ul style="list-style-type: none"> • Types of equipment • Appropriate uses • Demonstration of equipment • Self-reading dosimeters 	Describe how to select and operate equipment for the different types of radiation. Identify the basic design principles of various detectors.
10:20 – 10:30	Break	
10:30 – 11:30	Group Sessions	See group objectives
11:30 – 12:45 PM	Lunch	
12:45 – 01:40	Regulatory Dose Limits and Radiation Dosimetry (Chapter 7) <ul style="list-style-type: none"> • Dose limits (public vs. occupational) • Types of dosimeters; how they work • Personnel monitoring requirements • Dosimetry reporting requirements 	Identify the regulatory dose limits for radiation workers, the embryo/fetus of a declared pregnant woman, and members of the public. Explain types and limitations of personnel dosimeters. Relate monitoring and reporting requirements.
01:40 – 01:50	Break	
01:50 – 02:30	Radiation Protection (Chapter 11) <ul style="list-style-type: none"> • ALARA • Methods for protection • Posting requirements 	Explain what ALARA is and how to implement. Describe methods used for radiation protection (e.g., time, distance, shielding, contamination control). Apply inverse square law.
02:30 – 02:40	Break	
02:40 – 03:00	Common Sources of Radiation (Chapter 6) <ul style="list-style-type: none"> • Naturally occurring • Medical 	Relate typical levels of radiation from common sources.
03:00 – 04:00	Group Sessions	See group objectives

Day Three	Description	Objectives
07:30 – 08:00 AM	Continental Breakfast	
08:00 – 09:00	Radiation Biology (Chapter 9) <ul style="list-style-type: none"> • Cellular, tissue, and systemic effects • Delayed effects, early somatic effects • Acute radiation syndrome • Hormesis, threshold vs. non-threshold • Risk vs. benefit 	Describe the biological effects of radiation and the dose levels where these effects occur. Contrast perceived vs. real risk.
09:00 – 09:10	Break	
09:10 – 10:20	Radiation Incidents and Emergency Response (Chapter 13) <ul style="list-style-type: none"> • Types (gauge, medical, academic) • Procedures • Source leakage, loss • Emergency personnel as responders • Performance based training • Interactions with public, media, and employees 	Define the RSO's role in planning for and preventing accidents. Examine key components of an emergency plan.
10:20 – 10:30	Break	
10:30 – 11:30	Group Sessions	See group objectives
11:30 – 12:45 PM	Lunch	
12:45 – 02:00	Radiation Protection Programs (Chapter 3) <ul style="list-style-type: none"> • Written programs • Key elements (e.g., RSO/RSC, facility design, PPE, procedures, records, audits) • Annual reviews • Topical discussions – security and current regulatory concerns on terrorism 	Examine key elements of an effective radiation protection program. Assess record keeping requirements
02:00 – 02:10	Break	
02:10 – 02:50	Responsibilities for Radiation Protection (Chap 16) <ul style="list-style-type: none"> • Who is responsible • Legal issues 	Relate various responsibilities for radiation protection and regulatory compliance.
02:50 – 03:00	Break	
03:00 – 04:00	Group Sessions	See group objectives

Day Four	Description	Objectives
07:30 – 08:00 AM	Continental Breakfast	
08:00 – 08:50	<p>NRC Regulations (Chapter 2)</p> <ul style="list-style-type: none"> • Part 19, Notices, Instructions to Workers • Part 20, Radiation Protection Standards • Parts 30-35, license types and provisions • Special requirements (gauges and licenses) 	<p>Identify critical provisions of Part 19 and 20 worker information and protection standards.</p> <p>Identify NRC license and registration requirements (e.g., exempt, general, specific).</p> <p>Interpret basic provisions for specific license categories</p>
08:50 – 09:00	Break	
09:00 – 09:50	<p>Radiation Producing Equipment (Chapter 12)</p> <ul style="list-style-type: none"> • Physics • Regulations • Programs • Dangers and biological effects 	<p>Learn differences between radiation producing equipment and radioactive material as far as regulations, licensing and programs are concerned.</p>
09:50 – 10:00	Break	
10:00 – 10:25	<p>Radioactive Waste (Chapter 14)</p> <ul style="list-style-type: none"> • Types of waste • Disposal options • Transfer vs. storage 	<p>Relate radioactive waste disposal regulations and options (e.g., sewer, DIS).</p> <p>Explain waste transfer and storage requirements (e.g., facility needs).</p>
10:25 – 11:15	<p>Packaging, Transport, and Receipt of Radioactive Materials (Chapter 15)</p> <ul style="list-style-type: none"> • Shipper's responsibilities • Transportation regulations (NRC, DOT, IATA) • Classification and packaging • Transport on public roads • Receipt of radioactive materials 	<p>Define shipper's responsibilities.</p> <p>Identify when radioactive materials are regulated for transportation purposes, and basic provisions for limited and Type A quantities of radioactive materials.</p> <p>Describe DOT provisions for employee training and transport on public roads.</p> <p>Procedures for safe receipt/opening of packages.</p>
11:15 – 12:30 PM	Lunch	
12:30 – 04:00 (15 min break)	<p>Laboratory Workstations</p> <ul style="list-style-type: none"> • Lab A - Radioactive decay measurements • Lab B - Solid scintillator detector • Lab C - Geiger counter operation/measurements • Lab D – Survey and decontamination techniques • Lab E – Direct/scatter radiation measurements 	<p>See Laboratory Agenda (handout)</p>

and leak testing

Day Five	Description	Objectives
07:30 – 08:00 AM	Continental Breakfast	
08:00 – 09:00	Regulatory Inspections (Chapter 17) <ul style="list-style-type: none">• How to prepare for NRC/state inspections• How to deal with inspectors• What to do if the inspection is going badly• What to do if called for an enforcement conference	Relate the inspection process. Explain how to prepare for and respond to enforcement activities.
09:00 – 09:10	Break	
09:10 – 09:30	Interactions with the Public and Media <ul style="list-style-type: none">• Discussion of media contacts and public information on the sensitive issue of radiation	Define the NRC's media notification criteria. Define key aspects of communicating with the public and media.
09:30 – 10:10	Group Sessions - Writing a License/Do's & Don'ts <ul style="list-style-type: none">• New, renewal, & amendment applications• NRC Form 313 or equivalent for Agreement states• Content• Fees	See group objectives
10:10 – 10:20	Break	
10:20 – 11:20	Group Sessions - Reportable Incidents <ul style="list-style-type: none">• When to/not to report an incident• Interactions with the public and media	See group objectives
11:20 – 12:00	Examination and wrap-up	Complete exam and score 85% or better