

Program Number _____

Program Name _____

Date _____



Medical Dosimetry Curriculum Analysis

DIRECTIONS: Determine the course(s) in which each of the following content areas is covered and enter the course number(s) and/or title(s) into the appropriate column. For guidance in what should be covered for each content area, please refer to the Medical Dosimetry Curriculum Version 2 (2000) published by the American Association of Medical Dosimetrists.

The curriculum is designed for students who have no practical background or experience in the field of radiation oncology. The suggested curriculum contains introductory courses to the various technical and medical areas of radiation oncology, and program director may choose to eliminate these courses for students who have had education or experience in these topics. However, program directors are encouraged to replace these introductory courses with refresher courses and should indicate these changes in the grid below.

Professional Curriculum	Prerequisite Course(s)	Program Course(s)
Applied Mathematics		
Geometry		
Right Triangles and Trigonometric		
Area and Volume Calculations		
Rectangular Coordinates		
Linear Functions		
Functions		
Graph of an Equation		
Equation of Lines		
Exponential Notation		
Exponential and Logarithmic Functions		
Scientific Notation		
Metric System Using Scientific International (S.I.) Units		
Medical Imaging With Application To Radiation Oncology		
Radiology		
Fluoroscopy		
Simulators		
Computed Tomography (CT)		
Ultrasound or Sonography		
Nuclear Medicine		
Magnetic Resonance (MR)		

Professional Curriculum	Prerequisite Course(s)	Program Course(s)
Treatment Modalities		
External Beam Radiation Treatment Equipment		
Radiation Biology		
Cell Division		
Cell Survival Curves		
Dose-Response Relationship		
Tumor Systems		
Dose-Rate Effect		
Radiation Pathology		
Radiation Carcinogenesis		
Treatment Preparation		
Clinical Evaluation		
Positioning and Immobilization		
Target Localization/Data Acquisition Spatial Coordinate System		
Data Transfer		
Contouring		
Computer Planning		
Dose Distribution Computations		
Plan Evaluation		
Dose Prescription		
Computation of Monitor Units		
Beam Modifying Devices		
Plan Implementation		
Quality Assurance (Cf: Q.A.)		
Clinical Oncology and Treatment Planning Considerations		
Site Specific		
Head and Neck		
Central Nervous System		
Pituitary Gland		
Thorax		
Breast		
Abdomen and Pelvis		
Hodgkin's Disease		
Extremities		
Total Body Irradiation (TBI)		

Professional Curriculum	Prerequisite Course(s)	Program Course(s)
Clinical Oncology and Treatment Planning Considerations (cont'd)		
Total Skin Electron Irradiation (TSI)		
Intraoperative Irradiation (IORT)		
Metastatic Disease		
Benign Disease		
Treatment Techniques – Site Specific (see above)		
Treatment Simulations – Site Specific (see above)		
Dose Calculations Considerations – Site Specific (see above)		
Critical Organs and Limiting Dose Factors - Site Specific (see above)		
Positioning and Immobilization - Site Specific (see above)		
Age Specific Considerations		
Isodose Distributions		
Documentation of Dose Distribution		
Central Axis (CAX) Depth Dose Distribution		
Isodose Curves		
Complex Factors Affecting Isodose Curves		
Typical Tissue Heterogeneities		
Comparison of Hand vs. Computer Generated Curves		
Common Discrepancies Found in Computer Generated Plans		
Beam Modification		
Matching Adjacent Fields		
Electrons Isodose Distribution		
Other Beams, Proton, Neutron, Deuterons		
General Treatment Principles		
Integral Dose		
Calculation of Dose in Shielded Regions		
Monitor Unit Treatment Time Calculations		
Correction of Exposure Rate or Absorbed Dose Rate		

Professional Curriculum	Prerequisite Course(s)	Program Course(s)
External Beam Dose Calculations		
Dosimetric Quantities		
CAX Does Calculations		
Irregular Field Calculation Techniques		
Set up Calculations		
Special Technique Calculations		
Dose Determination – External Beam		
Instrumentation		
Dose		
Definitions		
Electron Beam Therapy		
History		
Electron Interactions Processes		
Energy Specification and Measurement		
Absorbed Dose Determination		
Clinical Characteristics of Electron Beams		
Depth Dose Curves		
Treatment Planning		
Shaping of Treatment Fields		
Electron Arc Therapy		
Total Skin Irradiation		
Nuclear Physics		
Introduction		
Matter		
Atomic Structure		
Nuclear Structure		
Atomic Mass/Energy Units		
Orbital Electrons		
Nuclear Forces		
Radiation		
Nuclear Transformations		
Radioactive Series		
Radioactive Equilibrium		
Interactions of Radiation with Matter		

Professional Curriculum	Prerequisite Course(s)	Program Course(s)
Nuclear Physics (cont'd)		
Nuclear Reactions		
Nuclide Activation		
Clinical Brachytherapy		
Introduction/Units of Measurement		
Radioactive Sources		
Calibration		
Instrumentation		
Calculation of Dose Distribution		
Definitions		
Treatment Planning/Clinical Dose Calculation		
Implantation Techniques		
Implant Localization/Verification		
High Dose Rate (HDR) Brachytherapy		
Regulations		
Radiation Safety		
Quality Assurance		
Prostate Brachytherapy		
Historical Perspective		
Basic Anatomy and Physiology of the Prostate		
Prostate Cancer Staging		
Isotopes Currently in Use		
Current Dosing Schemes		
Seed Distribution Philosophies		
Current Implant Techniques (LDR)		
Current Implant Techniques (HDR)		
Postimplant Dosimetry		
Radiation Safety		
Future Considerations		

Professional Curriculum	Prerequisite Course(s)	Program Course(s)
Radiation Protection		
Dose Equivalent		
Protection Regulations (Dose Limits)		
Background Sources of Radiation		
Structural Shielding Design		
Personnel Monitoring		
NRC Regulations		
Radiation Monitoring Instruments		
Radiation Surveys		
3-D Treatment Planning		
Patient Positioning and Immobilization		
Imaging		
3-D Geometry Definition		
Treatment Planning System Functionality and Limitations		
Treatment Planning		
Plan/Dose Evaluation		
Plan Verification		
Terminology		
Intensity Modulated Radiation Therapy (IMRT)		
Stereotactic Radiosurgery/Radiotherapy		
Definitions		
Image Acquisition		
Planning Process		
Radiation Treatment Delivery		
Physics Acceptance Testing and Commissioning		
Quality Assurance (Q.A.)		
Definition		
A.L.A.R.A. Standards		
Q.A. Commissions		
Components of a Q.A. Program		
Professional Relationships and Responsibilities		
Q.A. Foundations in Equipment Specification, Acceptance Testing, and Commissioning		
Radiotherapy Linear Accelerator		
Q.A. of Radiotherapy Localizer and Simulator		

Professional Curriculum	Prerequisite Course(s)	Program Course(s)
Quality Assurance (Q.A.) (cont'd)		
Q.A. of CT and MR		
Q.A. for Intraoperative Radiotherapy Linear Accelerators		
Q.A. of Linac Based Stereotactic Radiosurgery		
Q.A. in Hyperthermia		
Q.A. of Low Dose-Rate Brachytherapy		
Q.A. Program for Dose Planning Computers		
Patient Calculation and Radiotherapy Chart Review		
Q.A. in the Fabrication of Radiotherapy Treatment Aids		
Dosimetry System Q.A.		
Professional Relations and Responsibilities		
Ethical Conduct		
Professional and Legal Perspective		
Divisions of Responsibilities		
Relationships and Insurance		
Reducing Liability/Defensive Medical Physics		
Professional – Patient Relationships		
Professional Development		
Malpractice Issues		
Cancer Patient Management		
Signs and Symptoms		
Cancer Treatment		
Cancer Management		
Computers and Computer Networking		
Hardware		
Software		
Networking		