Intensity-modulated radiotherapy (IMRT) is now common in many therapy centers. Quality assurance (QA) procedures for a linear accelerator (linac) and multi-leaf collimator (MLC) designed for conventional static fields do not address the unique dosimetric issues pertinent to IMRT planning and delivery. IMRT portals are composed of many irregular, small, off-center, and abutting field segments throughout the target volume, each delivering only a few MU. In these regards, emphasis should be placed on beam stability for small MU and leaf position accuracy with gantry rotation. At the same time, the target volume, shielded by the MLC for much of the treatment, sees a larger transmitted dose, especially for MLC with rounded leaf ends, The impact of delivery technique, segmented (step and shoot) or dynamic (sliding window), on the required leaf position tolerance is not fully appreciated and will be addressed. While the mechanics and software of the various linacs and MLC distinguish them, there are many aspects of QA in common. This course will discuss: (1) the specific QA related to the MLC design; (2) additional QA for linear accelerators pertinent to the small MU and small field sizes used in IMRT; (3) tools and procedures often used to perform these QA tasks; (4) specific QA issues for different IMRT delivery methods.

Educational Objectives:

(1) Understand different IMRT delivery methods and their specific QA issues.
(2) Understand effect of QA on the IMRT delivery accuracy.
(3) Understand the importance of proper commissioning of the planning system to avoid confusion with dose delivery issues.