



The Hashemite University
Faculty of Allied Health Sciences
Department of Medical Imaging
Course Syllabus

| Course information | |
|----------------------|---------------|
| Course Title | Radiotherapy |
| Course Code | 110508355 |
| Prerequisites | 110102161 |
| Credit Hours | 3 (2+3) hours |

| Course Description |
|--|
| This course introduces the student to both basic physical principles of radiation therapy and physical aspects of treatment planning using photon beams, electron beams and brachytherapy sources. For the modern clinical radiation therapy, additional information will be discussed such as Intensity Modulated Radiation Therapy and Stereotactic Radio-surgery. |

| Course Objectives |
|---|
| By the end of this course, student is expected to: |
| <ol style="list-style-type: none"> 1- Describe major quantities and concepts that are useful for measuring dose distribution directly in patients treated with radiation 2- Discuss Several methods are available for calculating absorbed dose in a patient 3- Identify isodose curves and dose profile 4- Discuss several aspects of treatment planning, including wedge filters, combination of radiation fields, tumor volume, acquisition of patient data, correction for contour curvature, and tissue inhomogeneities and patient positioning. |

| Recommended Textbook | |
|----------------------|----------------------------------|
| Title | The Physics of Radiation Therapy |
| Author | Faiz M. Khan |
| Publisher | Lippincott Williams and Wilkins |
| Year | 2010, |
| Edition | 4 th Ed |
| Book website | |

| Other References | |
|------------------|--|
| Title | 1- Clinical Radiotherapy Physics , Basics Physics and Dosimetry, , |
| Author | Jayaraman and L.H. Lanzl |
| Publisher | CRC Press |
| Year | 1996 |
| Edition | Vol. 1 |
| Title | Radiation Therapy Physics |
| Author | Alferd R. Smith |
| Publisher | Springer-Verlag |
| Year | 1995 |
| Edition | 3 rd Ed. |

| websites | |
|---|--|
| Website | |
| Course Contents | |
| <p>Chapter 1. Physical Concepts and Radiotherapy</p> <ul style="list-style-type: none"> ❖ Radiation ❖ Type of ionizing radiation ❖ Radiation units ❖ Interaction of Radiation with matter ❖ Radiation therapy ❖ Uses of radiotherapy ❖ Types of radiotherapy <p>Chapter 2. Dose Distribution and Scatter Analysis</p> <ul style="list-style-type: none"> ❖ Phantoms ❖ Depth Dose Distribution ❖ Percentage Depth Dose ❖ Tissue-Air Ratio <p>Chapter 3. A System of Dosimetric Calculation</p> <ul style="list-style-type: none"> ❖ Dose calculation Parameters ❖ Practical applications <p>Chapter 4. Treatment Planning I</p> <ul style="list-style-type: none"> ❖ Isodose chart ❖ Parameters of isodose curves ❖ Wedge filters ❖ Combination of Radiation fields ❖ Isocentric techniques ❖ Tumor dose specification for external photon beams <p>Chapter 5 Treatment planning II</p> <ul style="list-style-type: none"> ❖ Acquisition of Patient data ❖ Treatment simulation ❖ Correction for contour irregularities and tissue inhomogeneities <p>Chapter 6 Treatment planning III</p> <ul style="list-style-type: none"> ❖ Field blocks ❖ Field shaping ❖ Skin dose ❖ Field separation <p>Chapter 7 Electron Beam Therapy</p> <ul style="list-style-type: none"> ❖ Electron interactions ❖ Determination of absorbed dose ❖ Characteristics of clinical electron beams ❖ Electron arc therapy ❖ Total skin irradiation | |

| Assessment | |
|----------------------------|----|
| First Exam | 25 |
| Second Exam | 25 |
| Final Exam | 40 |
| Lab + In course assessment | 10 |