

## Radiation Therapy Physics II – Radiation Therapy Treatment Planning

			Chapter(s)	
Monday	7 January, 2008	Overview, Physicist Role	1	Hanny
Wednesday	9 January, 2008	Rad Biology	17	Hanny
Monday	14 January, 2008	Imaging/Data Acq/Organ Motion	2, 3, 4	Hanny
Wednesday	16 January, 2008	3D CRT/IMRT	10, 11	Hanny
Monday	21 January, 2008	Martin Luther King, Jr. Holiday		
Wednesday	23 January, 2008	Treatment Planning Lab - TPS		
Monday	28 January, 2008	Treatment Plan Evaluation	16	Hanny
Wednesday	30 January, 2008	Treatment Planning Lab - Charts	(powerpoints due)	
Monday	4 February, 2008	GI Tract/Gyn/Quiz 1	18, 19	Cutlip/Neel
Wednesday	6 February, 2008	Treatment Planning Lab - GI/Gyn		
Monday	11 February, 2008	Prostate/Bladder/Testis	20A, B, C	Kleismit
Wednesday	13 February, 2008	Treatment Planning Lab - Prostate		
Monday	18 February, 2008	Lymphomas/Head & Neck/Quiz 2	21, 22	Smith/King
Wednesday	20 February, 2008	Treatment Planning Lab – H&N		
Monday	25 February, 2008	Skin/Breast	23, 24	Neel/Desfoolian
Wednesday	27 February, 2008	Treatment Planning Lab - Breast		
Monday	3 March, 2008	CNS/Pediatric	25, 26	Cutlip/Desfoolian
Wednesday	5 March, 2008	Treatment Planning Lab - Brain		
Monday	10 March, 2008	Thorax/Extremities/Quiz 3	27, 28	Smith/King
Wednesday	12 March, 2008	Treatment Planning Lab – Chest		
Monday	17 March, 2008	Final Exam		

# Radiation Therapy Physics II

## Texts:

**Treatment Planning in Radiation Oncology, 2nd edition** by Faiz M Khan

## Useful Resources:

Radiation Therapy Planning, 2nd edition by Gunilla Bentel

Treatment Planning & Dose Calculation in Radiation Oncology by Bentel, Nelson, Noell

Radiation Oncology Management Decisions by Chao, Perez, Brady

Radiation Therapy Oncology Group (RTOG) Protocols, [www.rtog.org](http://www.rtog.org)

## Grading Policy

**Homework/Instruction – 35%** - you will be given treatment plans to evaluate

Due 1 week after assigned  
(8-14 days = ½ credit, >14 days = 0 credit)

**3 Quizzes – 15%**

10-20 Simple Answer or Multiple Choice

**3 Full Treatment Plans – 30%** - you will be given CT images, diagnosis, and prescription. You will plan the treatment, evaluate the plan, perform the physics 2<sup>nd</sup> check, perform dosimetry QA (measure dose) and prepare the treatment chart. **Required plans: Brain, Breast, Prostate**

Each additional plan = 5% reduction in Quizzes/Final burden (different major organ group)

Example: 3 required plans + 3 additional plans; Final counts as 5% of grade OR no need to take quizzes  
Optional plans include: Chest, H&N, extremity, Gyn, esophagus, skin, bladder, testis, etc.

Each additional plan = 2.5% reduction in Quizzes/Final (same organ group, diff patient, 4 Max)

Example: 3 required plans + 6 additional plans; Final counts as 5% of grade OR no need to take quizzes  
No more than 4 additional plans of this type for a major organ group.

Example: 4 brain plans + 2 breast plans = ok, 6 brain plans = not ok

Dose measurements are for required plans, not additional plans.

Due 12 March 2008; however, get them in ASAP. Scoring is Pass/Fail and may be handed back to answer questions until acceptable for Pass.

**Final Exam – 20%**

30-40 Simple Answer or Multiple Choice

## **Instruction/Presentations/PowerPoint slides**

You will present your assigned chapter using PowerPoint slides. Let me know if that's not available to you. Please send me a copy of your slides by January 30<sup>th</sup> so I can make sure everything is covered. I may add some material or diagrams not available in the book. This also allows me to print handouts for each class so you don't have to.

The following should be covered in each presentation where possible:

### Introduction

- Staging and survival rates (simple – don't get carried away)

- Imaging modalities

- Anatomy involved (Tissue to be treated, critical organs, and tissue tolerances)

### Treatment Options and Strategy

#### Radiotherapy Technique

- Prescription Dose

- Modality & Energy

- Fractionation

- Setup

- Field design

- Bolus, block, wedges, compensators, extended SSD, etc.

- Other treatment or immobilization devices

### Plan evaluation

- DVH – PTV, OAR, PRV

- EUD

- Optimal Gantry, Collimator, etc.

### QA and in-vivo dosimetry