



# BROWARD COMMUNITY COLLEGE COURSE OUTLINE

**LAST REVIEW: 2008-2009**

**NEXT REVIEW: 2013-2014**

**STATUS: A**

*(i.e. 2003-2004)*

*(i.e. 2008-2009)*

*(A, I, D)*

**COURSE TITLE:** Principles of Radiation Therapy I

**COMMON COURSE NUMBER:** RAT2021

**CREDIT HOURS:** 3

**CONTACT HOUR BREAKDOWN**

*(per 16 week term)*

**CLOCK HOURS:**

*(Voc. Course ONLY)*

Lecture: 48

Lab:

Clinic:

Other:

**PREREQUISITE(S):** RAT2617, RAT2023, RAT2814

**COREQUISITE(S):** RAT2617, RAT2023, RAT2814

**COURSE DESCRIPTION :** An introduction to the principles of radiation therapy and radiation protection providing the student with basic concepts to prepare him/her for clinical education.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s):

Area

General Education Requirements – Associate in Science Degree (AS), meets Area(s):

Area

General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s):

Area

## UNIT TITLES

1. Therapeutic Treatment Machines
2. Dose calculation terminology
3. Machine settings for delivery of prescribed radiation
4. Working parts of a therapeutic treatment machine
5. Treatment aides.
6. Radiation safety/protection
7. Clinical patient case presentation

## ASSESSMENT:

Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes.

**Assignments, comprehensive/cumulative unit exams, comprehensive/cumulative final exam**

**Common Course Number:** RAT2021

## UNITS



**Unit 1 Therapeutic Radiation treatment machines**

**General Outcome:**

- 1.0 The student shall: be able to discuss the differences in treatment machines, including energy ranges and application in radiation therapy.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 1.1 Describe soft energy therapy units (grenz and contact therapy) including energy ranges and their clinical application in radiation therapy.**
- 1.2 Explain superficial/orthovoltage therapy units including energy ranges and their application in radiation therapy.**
- 1.3 Describe megavoltage treatment machines (linear accelerator, Cobalt 60, betatron, Van de Graff; cyclotron, microtron, neuclotron) including energy ranges and their clinical application in radiation therapy.**



**Common Course Number:** RAT2021

## **UNITS**

### **Unit 2 Dose calculation terminology**

#### **General Outcome:**

- 2.0 The student shall: be able to discuss terminology related to dose calculation used in radiation therapy.**

#### **Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 2.1 Compare depth dose percentage, tissue air ratio, tissue maximum ratio, and tissue phantom ratio.**
- 2.2 Explain the difference between roentgen, rad and gray doses.**
- 2.3 Define machine settings in time versus monitor units.**
- 2.4 Discuss a treatment prescription**
- 2.5 Explain treatment volumes.**
- 2.6 Compare dose values (minimum, mean, maximum, etc.).**
- 2.7 Discuss treatment planning utilizing D/max, SSD, SAD, isocentric, and midplane terminology**



**Common Course Number:** RAT2021

**UNITS**

**Unit 3 Machine settings for delivery or prescribed radiation**

**General Outcome:**

- 3.0 The student shall: be able to accomplish simple calculations for prescribed radiation doses.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 3.1 Employ a calculator to solve for time/monitor units.**
- 3.2 Identify and use the proper calculation sheet for each therapeutic treatment machine.**
- 3.3 Calculate time/momtor units according to treatment prescription.**



**Common Course Number:** RAT2021

## **UNITS**

### **Unit 4 Working parts of a therapeutic treatment machine**

#### **General Outcome:**

- 4.0 The student shall: be able to explain the working parts of a therapeutic treatment machine including the mechanical and energy producing units.**

#### **Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 4.1 Discuss a superficial/orthovoltage machine including the console, filtration system, and mechanical apparatus utilized in the treatment of patients.**
- 4.2 Explain a cobalt therapeutic machine including source, console, and mechanical apparatus utilized in the treatment of patients.**
- 4.3 Discuss a linear accelerator including the console, gantry, gantry stand utilized in the treatment of patients with both photon and electron energies.**



**Common Course Number:** RAT2021

## **UNITS**

### **Unit 5 Treatment aids**

#### **General Outcome:**

- 5.0 The student shall: be able to identify treatment aids including their relationship to dose calculation.**

#### **Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 5.1 Define bolus and its effect on treatment doses.**
- 5.2 Explain the changes in calculation due to collimator setting and irregular shaped (blocked) fields.**
- 5.3 Discuss the use of wedges and compensators in calculating treatment doses.**
- 5.4 Discuss the use of various immobilization devices pertaining to dose calculation.**
- 5.5 Explain the different types of calipers utilized for patient diameter measurement.**



**Common Course Number:** RAT2021

## **UNITS**

### **Unit 6 Clinical patient case presentation**

#### **General Outcome:**

- 6.0 The student shall: be able to discuss the case history of a radiation patient chosen during the previous week's clinical assignment.**

#### **Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 6.1 Discuss the case history of an actual radiation therapy patient including but not limited to:**
- A. Reason for choice.**
  - B. Treatment prescription/plan**
  - C. Pathology, including stage**
  - D. Current treatment doses.**