



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: Radiographic Processes

COMMON COURSE NUMBER: RAT 1111

CREDIT HOURS: 2

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS:

(Voc. Course ONLY)

Lecture: **32**

Lab:

Clinic:

Other:

PREREQUISITE(S): RAT 1001, RAT 1614

COREQUISITE(S):

PRE/COREQUISITE(S): RAT 1021C, RAT 1111L

COURSE DESCRIPTION: Introduction to radiographic processes to include photographic and geometric factors, beam restriction, grids, cassettes and screens, processing, contrast media, automatic exposure control, fluoroscopy, computed tomography, and digital imaging.

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. Beam Restriction | 8. Contrast Media |
| 2. Grids | 9. Distortion |
| 3. Cassettes & Intensifying Screens | 10. Detail |
| 4. Radiographic Film & Processing | 11. Fluoroscopy |
| 5. Digital Imaging | 12. Automatic Exposure Control |
| 6. Density | 13. Computed Tomography |
| 7. Contrast | |

EVALUATION:

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

Assessment includes examinations, assignments, and online posts.



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Common Course Number: RAT 1111

UNITS

Unit 1 Beam Restriction

General Outcome:

- 1.0 The student shall be able to accurately describe the methods and rationale for beam restriction.

Specific Measurable Learning Outcomes:

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

- 1.1 Describe the effects of scatter radiation on the radiographic image & patient dose.
- 1.2 Identify factors that affect the amount of scatter radiation produced.
- 1.3 Explain the purpose & construction of beam-restricting devices.
- 1.4 Compare advantages & disadvantages of various beam-restricting devices.



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UNITS

Unit 2 Grids

General Outcome:

2.0 The student shall be able to accurately describe the purpose and utilization of grids for radiographic imaging.

Specific Measurable Learning Outcomes:

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

- 2.1 State the purpose of a grid & describe grid construction.**
- 2.2 Differentiate between types of grids & grid patterns.**
- 2.3 Describe the criteria used for evaluating grid performance.**
- 2.4 Explain the relationship between grid selection, patient dose, & image density.**
- 2.5 Discuss the types of errors made when using a grid & identify their correction.**



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UNITS

Unit 3 Cassettes & Intensifying Screens

General Outcome:

- 3.0 The student shall be able to accurately describe the purpose and utilization of cassettes and intensifying screens for radiographic imaging.**

Specific Measurable Learning Outcomes:

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

- 3.1 State the purpose of cassettes & intensifying screens.**
- 3.2 Describe the components of cassettes & intensifying screens.**
- 3.4 Evaluate intensifying screen phosphor materials.**
- 3.5 Explain the relationship between screen speed, patient exposure, & image quality.**
- 3.6 Discuss the care of intensifying screens.**



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UNITS

Unit 4 Radiographic Film & Processing

General Outcome:

4.0 The student shall be able to accurately describe the types & utilization of radiographic film and methods for its processing.

Specific Measurable Learning Outcomes:

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

- 4.1** Describe the components of radiographic film.
- 4.2** Explain the process of latent image formation.
- 4.3** Identify common film sizes.
- 4.4** Explain the relationship between film speed, patient exposure, & image quality.
- 4.5** Discuss the fundamentals of proper film storage & handling.
- 4.6** Identify common film artifacts.
- 4.7** Identify components of a radiographic darkroom.
- 4.8** Explain the process of film development.
- 4.9** Describe the components & operation of an automatic film processor.
- 4.10** Describe chemicals used in radiographic film development.



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Unit 5 Digital Imaging

General Outcome:

5.0 The student shall be able to accurately describe equipment and methods used for digital radiographic imaging.

Specific Measurable Learning Outcomes:

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

- 5.1** Compare & contrast conventional & digital radiography.
- 5.2** Describe the components & operation of a computed radiography (CR) system.
- 5.3** Describe the components & operation of a direct radiography (DR) system.
- 5.4** Describe processing of CR & DR images.
- 5.5** Discuss factors affecting digital image quality.
- 5.6** Identify & describe post-processing manipulation of digital images.



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Unit 6 Density

General Outcome:

6.0 The student shall be able to accurately describe image density and the factors that affect it.

Specific Measurable Learning Outcomes:

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

- 6.1** Define density & explain how to evaluate it on a radiographic image.
- 6.2** Describe the factors that affect image density & explain how to manipulate them.
- 6.3** Utilize mAs reciprocity, the 15% rule, & the density maintenance formula to adjust image density.



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Unit 7 Contrast

General Outcome:

7.0 The student shall be able to accurately describe image contrast and the factors that affect it.

Specific Measurable Learning Outcomes:

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

- 7.1** Define contrast & explain how to evaluate it on a radiographic image.
- 7.2** Differentiate between different types of contrast.
- 7.3** Describe the factors that affect image contrast & explain how to manipulate them.



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Unit 8 Contrast Media

General Outcome:

8.0 The student shall be able to describe contrast media and discuss its usage for imaging.

Specific Measurable Learning Outcomes:

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

- 8.1** Define contrast media & discuss its purpose for radiographic imaging.
- 8.2** Identify materials used as contrast agents.
- 8.3** Differentiate between various types of contrast media.
- 8.4** Identify routes of administration for contrast media.
- 8.5** Describe contraindications & possible reactions to contrast media.
- 8.6** Discuss technical adjustments to be made when using contrast media for imaging.



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UNITS

Unit 9 Distortion

General Outcome:

9.0 The student shall be able to accurately describe image distortion and the factors that affect it.

Specific Measurable Learning Outcomes:

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

- 9.1 Define distortion & explain how to evaluate it on a radiographic image.**
- 9.2 Differentiate between types of image distortion.**
- 9.3 Describe the factors that affect image distortion & explain how to control them.**



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UNITS

Unit 10 Detail

General Outcome:

10.0 The student shall be able to accurately describe image detail and the factors that affect it.

Specific Measurable Learning Outcomes:

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

- 10.1** Define detail & explain how to evaluate it on a radiographic image.
- 10.2** Differentiate between types of image detail.
- 10.3** Describe the factors that affect image detail & explain how to manipulate them.



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UNITS

Unit 11 Fluoroscopy

General Outcome:

11.0 The student shall be able to accurately describe fluoroscopy and explain its usage for imaging.

Specific Measurable Learning Outcomes:

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

- 11.1** Define fluoroscopy & differentiate it from static imaging.
- 11.2** Describe the components & operation of a typical fluoroscopic unit.
- 11.3** Discuss the relationship between the use of fluoroscopy & patient dose.



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UNITS

Unit 12 Automatic Exposure Control

General Outcome:

12.0 The student shall be able to accurately describe the components and operation of an automatic exposure control (AEC) for imaging.

Specific Measurable Learning Outcomes:

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

- 12.1 State the purpose of an AEC.**
- 12.2 Describe the components & operation of an AEC.**
- 12.3 Discuss the factors that affect the utilization of an AEC for imaging.**
- 12.4 Explain the limitations of an AEC system.**



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Unit 13 Computed Tomography

General Outcome:

13.0 The student shall be able to accurately describe computed tomography (CT) and explain its use for imaging.

Specific Measurable Learning Outcomes:

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

- 13.1** Define computed tomography & identify its clinical applications.
- 13.2** Discuss the developmental history of CT.
- 13.3** Describe the components & operation of a CT scanner.
- 13.4** Discuss the factors that affect the quality of CT images.
- 13.5** Discuss the relationship between the use of CT & patient dose.
- 13.6** Identify the various types of CT scanning & innovations of the technology.