JEFFERSON COLLEGE

COURSE SYLLABUS

RAD165

Radiographic Pharmacology

3 Credit Hours

Revised by: Janet E. Akers BS RT (R)(M)
Date: September 30, 2013

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Dena McCaffrey, Dean, Career & Technical Education
RAD165 Radiographic Pharmacology

I. CATALOGUE DESCRIPTION

A. Prerequisites: Acceptance to Radiologic Technology Program, Reading Proficiency

B. Credit hour award: 3

C. Description: This course covers the fundamentals of pharmacology including drug absorption, metabolism, and excretion responses for selected drugs and contrast media used in radiology and radiographic procedures. The desired effects, mechanism of actions and adverse effects of contrast media on the human body are discussed. An introduction to venipuncture is included. (F)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

<table>
<thead>
<tr>
<th>Expected Learning Outcomes</th>
<th>Assessment Measures</th>
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<tbody>
<tr>
<td>Recognize common drug nomenclature in venipuncture and contrast administration and the basic concepts of pharmacology.</td>
<td>Class Discussion/Activity</td>
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<td>Written Examinations</td>
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<td>Written Assignments</td>
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<tr>
<td>Compare the basic concepts of radiopharmaceuticals, exams using radiopharmaceuticals and radiation safety.</td>
<td>Class Discussion/Activity</td>
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<td>Written Examinations</td>
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<td>Written Assignments</td>
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<td>Differentiate the drugs used for adverse contrast reactions or emergency situations during radiological procedures.</td>
<td>Class Discussion/Activity</td>
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<td>Compare the biological factors that affect the action of drugs.</td>
<td>Class Discussion/Activity</td>
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<td>Written Examinations</td>
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<td>Analyze legal issues pertaining to Drugs.</td>
<td>Class Discussion/Activity</td>
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<td>Written Examinations</td>
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<td>Distinguish between photon and electron interactions with matter.</td>
<td>Class Discussion/Activity</td>
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<td>Written Examinations</td>
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III. OUTLINE OF TOPICS

A. Evolution of Radiologic Technology
1. Scope of Practice
2. Educational Standards
3. Position on Venipuncture

B. Legal Opinions Pro and Con
1. Cope of Practice
2. Personal Responsibility
3. Cost of Health Care
4. Medical Malpractice/Negligence

C. Pharmacology
1. Defined
   i. Medical Terminology
   ii. Sources of Drugs
2. Pharmacological Divisions
3. Nomenclature
   i. Chemical Name
   ii. Generic Name
   iii. Trade or Brand Name
   iv. OTC Over-The-Counter
   v. Legend or Prescription Drugs
   vi. Controlled Substance
4. Drug Laws and Standards
   i. Food and Drug Administration (FDA)
      1. Drug Testing and Standards
   ii. Drug Enforcement Agency (DEA)
      1. Drug Laws and Enforcement
      2. Controlled Substance
      3. Guidelines for Health Care Workers Involved in Medication Dispensing
5. Drug References
   i. Drug Categories
   ii. Package Insert Information
   iii. Physician’s Desk Reference (PDR)
   iv. US Pharmacopeia/National Formulary (USP/NF)
   v. Facts and Comparison
6. Charting and Consent Forms

D. Drug Abuse
1. Categories of Abuse
   i. Stimulants
   ii. Depressants
   iii. Narcotics
   iv. Hallucinogenic
   v. Safeguards to Prevent Drug Abuse
2. Terminology
   i. Addiction
   ii. Dependency
iii. How to Safeguard Against Potential Drug Abuse in Patient Areas

E. Factors Affecting Drug Action
   1. Dosage Forms
      i. Aqueous Preparation
      ii. Alcohol Preparations
      iii. Solid and Semisolid Preparations
   2. Absorption
      i. Surface Area
      ii. Blood Flow
      iii. Passive
      iv. Active
      v. Ionization/Acid-Based Properties
      vi. Lipid Solubility
   3. Distribution
      i. Plasma Binding
      ii. Blood Flow
      iii. Tissue Barriers
   4. Metabolism
      i. Oxidation
      ii. Conjunction
      iii. Factors Adversely Affecting Metabolism
   5. Excretion
      i. Kidney
      ii. G.I. Tract
      iii. Respiratory
   6. Individual and Environmental Factors

F. Basic Concepts
   1. Site of Action
   2. Mechanism of Action
   3. Receptor Site
   4. Agonist/Antagonist/Potentiation
   5. Half Life
   6. Therapeutics Index
   7. Dose-Response Curve
   8. Time Response Curve
   9. Adverse Effects
      i. Toxic Effects
      ii. Carcinogenic
      iii. Teratogenic
      iv. Allergic Reactions
      v. Idiosyncratic Reactions

G. Radiopaque Contrast Media
   1. Chemical Make-up of Contrast
   2. Osmolarity, Osmolarity, Osmotic Activity
   3. Intravascular and Enteral Contrast Media
H. Pharmacodynamics of Radiopaque contrast media (ROCM)
   1. Iodine Concentration
   2. Osmolality Effect
   3. Chelation Effect
   4. Coagulation Effect
   5. Immune Response
   6. Renal Effects
   7. Thyroid Effects
   8. Patient Screening
   9. Drug Interactions
I. Routes of Administration
   1. Six “Rights” of Drug Administration
   2. Routes
      i. Oral
      ii. Sublingual/Buccal
      iii. Parenteral
      iv. Topical
      v. Rectal
   3. Administration Guidelines
   4. Abbreviation & Symbols of Medication
J. Venipuncture
   1. Universal Precautions
      i. Terms Related to Infection Control
      ii. Cycle of Infection
      iii. Infectious Organisms
      iv. Medical Asepsis
      v. Centers for Disease Control (CDC) Precautions
   2. Venous Anatomy
   3. Venipuncture Technique
      i. Supplies
      ii. Vein Selection
      iii. Procedure
      iv. Contrast Screening
      v. Complications
      vi. Post Procedure
   4. Injecting Through Existing Lines
      i. Chemical Compatibility
      ii. Avoiding Causing an Infection
      iii. Proper Use of Power Injector
      iv. The Do’s and Don’ts of Injecting Through Existing Lines
K. Emergency Medications
   1. Drugs for Cardiac Arrest
   2. Drugs for Respiratory Arrest
   3. Drugs for Contrast Reactions
L. Overview of Drugs Encountered in Radiology
   1. Cardiac Medications
2. Diuretics
3. Antihypertensive
4. Antiallergics/ Antihistamine
5. Bronchial Dilator
6. Chemotherapy
7. Antibacterials/Antiviral
8. Conscious Sedation
M. Radiopharmaceuticals
1. Beta/Gamma/Alpha Particles
2. Organ Imaging
3. Radiation Safety

IV. METHOD(S) OF INSTRUCTION

This course is taught using a variety of instructional methods, which include but are not limited to interactive lectures, computer presentations, group activities and exercises, videos, supplemental handouts and student presentations. Students are expected to be ACTIVE participants in the learning process. Students are expected to read the assigned readings prior to scheduled class meetings and come to class prepared to actively participate in all activities.

V. REQUIRED TEXTBOOK(S)


VI. REQUIRED MATERIALS

A. A computer with internet access and basic software to include Word and Power Point (available through Jefferson College labs)
B. Course homepage available through Blackboard
C. Binder, paper, pens, pencils with erasers, highlighters

VII. SUPPLEMENTAL REFERENCES

A. Class Handouts
B. Library Resources
1. Textbooks
2. Periodicals
3. Films On Demand Videos
C. Internet Resources
1. On-line references
2. Textbook companion website

VIII. METHOD OF EVALUATION (basis for determining course grade)
GRADES – Grades will be based on the percentage of total points earned out of total points possible for this semester. The assignments will vary in the number of possible points based upon amount of work involved and complexity of material. A final semester grade of 80% or above must be achieved in this course to successfully complete this course.

EXAMS – Exams will be given on the dates published in the class schedule. All exams with scores less than 75% must be retaken until a score of 75% or above is achieved to complete course requirements. The original score will be used to figure the semester grade. The student will be allowed to retake an exam a maximum of two times. If the student has not passed an exam within the three designated attempts, the student will present to the review board and may be dismissed from the program. The student must contact the instructor prior to any absence to make arrangements for retesting. Until course requirements are met the final grade will be an incomplete.

If an exam is not taken at the scheduled time and arrangements for a make-up exam have not been made prior to the designated exam time, the grade for that exam will be zero. No make-up exam will be considered unless the instructor is personally notified prior to the absence. If a student arranges to take the exam at other than the scheduled time, 5% will be deducted from the grade on that exam. Make-up exams are scheduled at the convenience of the instructor.

Student’s grade will also be based on participation in class and attendance.

ASSIGNMENTS – In order to be prepared for each class meeting, the student should complete each homework assignment prior to the following class meeting. Assignments will consist of worksheets, textbook reading, review questions and other activities to enhance the learning experience. Evaluation tools will include research projects, written and oral communication projects, class attendance/participation, homework assignments, and exams.

All assignments must be typewritten and are due at the beginning of class on the assigned due dates. Late assignments will not be accepted. In-class quizzes and assignments cannot be made up.

Grading Scale: (Jefferson College Radiologic Technology Program’s)

A= 100-92%
B= 91.9-86%
C= 85.9-80%
D= 79.9-70%
F= 69.9 and below
I= Incomplete
W= Excused withdrawal from course

IX. ADA AA STATEMENT
Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, http://www.jeffco.edu/jeffco/index.php?option=com_weblinks&catid=26&Itemid=84

XI. ATTENDANCE STATEMENT

Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details. Student’s grade will also be based on participation in class and attendance.