Inter American University of Puerto Rico
Guayama Campus
Department of Health Sciences
Inter Humacao University Center
Associate of Applied Science Degree in Radiologic Technology

SYLLABUS

I. GENERAL INFORMATION

Course Title	:	Pharmacology and Venipuncture
Code and Number	:	RATE 2090
Credits	:	Three (3)

II. DESCRIPTION

Study of the basic concepts of pharmacology, venipuncture, and administration of contrast media and intravenous medications. Discussion of patient care during procedures that use contrast. Requirement: RATE 1110. 3 credits.

III. OBJECTIVES

It is expected that upon completion of the course, the student will be able to:

1. Discuss the general concepts related to the composition of contrast media and their use in the different radiographic studies of the digestive, urinary, and bile duct systems.
2. Recognize the most common adverse reactions to contrast media.
3. Identify signs and symptoms of adverse reaction to contrast dye.
4. Explain the procedure and standards of care during venipuncture.
5. Demonstrate attitudes of respect, responsibility, and confidentiality.

IV. THEMATIC CONTENT

A. Role of the Radiological Technologist
   1. Historical perspective
   2. Ethical and legal implications
   3. Standard of Care

4. HIPAA

B. Principles of Pharmacology
    1. Nomenclature
    2. Drugs with legends
    3. Prescriptions
    4. Controlled substances
    5. Herbal Products
    6. Documentation

C. Biopharmaceutical and Pharmacokinetics
    1. Biopharmaceutical
        a. Dosage
        b. Tablets
        c. Capsules
        d. Troches
        e. Suppositories
        f. Liquid dose
        g. Parenteral
        h. Disintegration and dissolution
    2. Pharmacokinetics
        a. Absorption
        b. Distribution
        c. Metabolism
        d. Excretion

D. Pharmacodynamics
    1. Mechanisms of action
    2. Drug Responses
    3. Half-life
    4. Therapeutic index
    5. Adverse effects
    6. Interactions

E. Drug Classification
    1. Cardiac medications
    2. Anticoagulants
    3. Antiplatelet
    4. Thrombolytic
    5. Analgesics
    6. Antihistamines
    7. Endocrine
    8. CNS Medications
    9. Chemotherapeutic agents
    10. Herbal products

F. Classification, Pharmacology, and Chemistry of Contrast Media
    1. Radiopaque contrast media
    2. Pharmacology of iodinated contrast media

3. Osmolality, osmolarity, and osmotic activity
4. Intravascular radiopaque contrast media
5. Enteral contrast media
6. Paramagnetic contrast agents

G. Pharmacodynamics of radiopaque contrast media
    1. Iodinated contrast media
    2. Diagnostic pharmacodynamics
    3. Adverse pharmacodynamics
    4. Category of reactions
        a. Slight
        b. Moderate
        c. Severe
        d. Specific organs
    5. Drug-drug interactions

H. Drug Administration Routes
    1. Systemic
        a. Oral
        b. Sublingual
        c. Buccal
        d. Topical
        e. Rectal
    2. Parenteral
        a. Intravenous
        b. Intra-arterial
        c. Intrathecal
    3. The six security rights
        a. Correct medication
        b. Correct dosage
        c. Right patient
        d. Correct time
        e. Correct route
        f. Correct documentation
I. Venipuncture
    1. Methods
        a. Continuous infusion
        b. Intermittent infusion
        c. Direct injection
        d. Hand injection
        e. Mechanical pressure injector
    2. Routes of administration
        a. Peripheral
        b. Central
    3. Complications
        a. Infiltration
        b. Extravasation

c. Embolism

4. Venipuncture procedure
    a. Team
    b. Patient identification
    c. Dose
    d. Universal precautions
    e. Emergency procedures
    f. Treatment follow-up
    g. Documentation
    h. Infection Prevention and Control

V.ACTIVITIES

1. Lectures by the teacher
2. Practice exercises
3. Discussion of readings and exercises
4. Application exercises
5. Self-evaluation
6. Collaborative work
7. Videos
8. Readings and supplementary exercises
9. Internet Search

VI.EVALUATION:

Criteria	Punctuation	% of Final Grade
3 partial exams	300	50 %
Final exam or equivalent assessment	100	25 %
Quiz	100	10 %
Tasks/Activities	100	15 %
Total	**600**	**100 %**

Credit(s)	Contact Hours	Compliance Regulation Title IV	Total (Academic term)
1 Credit	15 hours contact per term	2 hours per week	30 hours
2 Credits	30 hours per term	4 hours per week	60 hours
3 Credits	45 hours per term	6 hours per week	90 hours
4 Credits	60 hours per term	8 hours per week	120 hours
5 Credits	75 hours per term	10 hours per week	150 hours

VII. ASSESSMENT STRATEGIES

Essay (Rubric)

VIII. SPECIAL NOTES

A. Auxiliary services or special needs

Any student requiring auxiliary services or special assistance must request them at the beginning of the courses or as soon as the student becomes aware that the services are needed through the corresponding registration with the Dean of Students.

B. Honesty, fraud, and plagiarism

Dishonesty, fraud or plagiarism committed by a student constitutes a serious violation of the General Student Regulations and may result in sanctions ranging from a written warning to suspension for a predetermined period of one year or more or permanent expulsion from the university, among other sanctions.

C. Use of electronic devices

Cell phones and any other electronic devices that may disrupt the teaching- learning process or disrupt an environment conducive to academic excellence will be disabled. Critical situations will be dealt with appropriately. The use of electronic devices that allow accessing, storing or sending data during tests or exams is prohibited.

D. Compliance with the provisions of Title IX

The Federal Law on Higher Education, as amended, prohibits discrimination on the basis of sex in any academic, educational activity, extracurricular and athletic or any other program or function, sponsored or controlled by an institution of higher education institution, whether or not conducted on or off the institution's property, if the institution receives federal funds.

In harmony with current federal regulations, an Assistant Title IX Coordinator has been designated in our academic unit to provide assistance and guidance on any alleged incident that constitutes sex or gender discrimination, sexual harassment or sexual assault. The Assistant Coordinator can be contacted by phone at (787) 864-2222, extension 2247 or by email at arcilia.riveragonzalez@guayama.inter.edu.

The normative document titled Norms and Procedures to Deal with Alleged Violations of the Provisions of Title IX is the document that contains the institutional rules to direct any complaint that appears to be this type of allegation. This document is available on the Website of Inter American University of Puerto Rico (www.inter.edu)

IX. EDUCATIONAL RESOURCES

Textbook:

Currie, G. (2021). *Pharmacology Primer for Medications in Nuclear Medicine and Medical Imaging* (1st ed.). Society of Nuclear Medicine & Molecular Imaging

X. BIBLIOGRAPHY (OR REFERENCES)

Books

Abrahams, P. H. (2020). Weir & Abrahams' Imaging Atlas of Human Anatomy (6th ed.). Elsevier

Adler, A., Carlton, R. and Kori, S. (2022). *Introduction to Radiologic & imaging sciences & patient care* (8th ed.). Elsevier

Colbert, B., James, A. & Katrancha, E. (2022). *Essentials of Pharmacology for Health Professions*. (9th ed.). Cengage Learning

Findeiss, L. K. (2020). *Venous interventional radiology*. Thieme

Hall, S. (2020). *The essentials in anatomy and physiology*. Elsevier

Kandarpa, K. (2017). *Handbook of interventional radiologic procedures*. English (5to ed.). Wolters Kluwer

Mehmet, S., Ros, P., Ichikawa, T. & Saylisoy, S. (2021). *Medical Imaging Contrast Agents: A Clinical Manual.* Springer International

Peart, O. J. (2021). *Radiographic positioning: Pocket guide* (2nd ed.). DLite Press

Saia, D. A. (2020). *Lange Q & A Radiography Examination* (12th ed.). McGraw-Hill Education

Schaub, M. & King, S. (2022). Blood Collection for Healthcare Professionals: A Short Course (4th Ed.). F.A. Davis Company

Speck, U. (2020). *X-Ray contrast media: Overview, use, and pharmaceutical Aspects.* Springer Berlin Heidelberg

OTHER

Electronic Resources

- Clinical Key: Elsevier
- American College of Radiology
- American Registry of Radiologic Technology
- American Society of Radiologic Technologists
- Association of Collegiate Educators in Radiologic Technology
- Image gently: The Image Gently Alliance
- Image Wisley: Radiation Safety in Adult Medical Imaging
- Joint Review Committee on Education in Radiologic Technology
- National Honors Society for Radiologic and Imaging Sciences (LAMBDA NU)
- The International Society of Radiology
- Hospital: 2022 National Patient Safety Goals

Database

CINAHL(EBSCO)
EBSCO

Magazines

Applied Radiology. Anderson Publishing Ltd, Ocean, NJ.

Diagnostic Imaging. United Business Media, San Francisco, CA.

Journal of Medical Imaging and Radiation Sciences. Published by Elsevier for the Canadian

Journal of Vascular Technology. Society of Vascular Technology, Lanham, MD.

Radiography. The College of Radiographers, St. Louis, MO.

Radiologic Science and Education. Association of Educators in Imaging and

Radiological Sciences, Albuquerque, NM.

Radiologic Technology. American Society of Radiologic Technologists, Albuquerque, NM.

Doctors. Radiological Society of North America, Oak Brook, IL.

Revised: January 2023