Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Fall 2021

Type of Action:

__ New
X Modification
__ Move to Inactive (Stop Out)
__ Cancellation

Course Alpha and Number: NU124

Course Title: Pharmacology for Nurses and Clinical Math

Reason for initiating, revising, or canceling:
This course guide is being updated to reflect updates in purpose, required textbooks, increase in contact hours to a 4-credits as this course addresses two major topics critical to nursing training, catalogue course description, course activities and design, course prerequisite(s), estimated cost of course/instructional resources, course outline, and assessment measures of student learning outcomes (SLOs).

Rosa T. Aldan Rosa T. Aldan, MA 06.08.2021

Proposer Date

Rosa T. Aldan Rosa T. Aldan, MA 06.08.2021

Department Chair Date

Adam Walsh 06.07.21

Language & Format Review Specialist Date

Ajani Burrell **06.08.2021**

Academic Council Chair Date

Lorraine Maui Lorraine Maui 06.28.2021

Interim Dean of Learning & Student Success Date

1. **Department**
   Nursing

2. **Purpose**
   The purpose of this course is to teach nursing students pharmacological concepts that include principles of pharmacology, pharmacokinetics, pharmacodynamics, pharmacotherapeutics, drug classifications and sub-classification systems, effects of medications in body systems, calculating medication dosages safely, and administration of medications. The target population is students in the first semester of the four-semesters Associate of Science Degree in Nursing (ASN) program in which this course is a requirement. Upon completion of the ASN program and after passing the nursing licensure examination, nursing graduates will be prepared to occupy Registered Nurse (RN) positions in the Commonwealth of the Northern Mariana Islands (CNMI).

3. **Description**

   A. Required/Recommended Textbook(s) and Related Materials
   Required:
   Burchum, J., & Rosenthal, L. (2019). Lehne's Pharmacology for Nursing Care, (10th ed.). St. Louis, MO: Saunders, Elsevier, Inc.

   Horntvedt, T. (2019). *Calculating Dosages Safely,* (2nd ed.). Philadelphia, PA: F.A. Davis Company

   Recommended: None

   B. Contact Hours
   1. **Lecture:** 4 per week / 60 per semester
   2. **Lab:** None
   3. **Other:** None

   C. Credits
   1. **Number:** 4
   2. **Type:** Regular Degree Credits

   D. Catalogue Course Description
   This course introduces the science of basic pharmacology and considers the role of the registered nurse in the preparation, management, and administration of medications. It provides a working description of the principles of pharmacokinetics, pharmacodynamics and identifies the role of nerve pathways

in the action of drugs. This course also emphasizes understanding the drug classifications, types, actions, contraindications, precautions, side effects, dosages, and nursing implications. It also covers dosage calculations and measurement systems, reading medication labels, using syringes, intravenous (IV) fluid calculations, and calculations in specialty units. Prerequisites: Acceptance into the nursing program. Concurrent enrollment: NU105, or approval of Nursing Department Chair. (Offered Fall)

E. Degree or Certificate Requirements Met by Course

This course fulfills the program requirement for the Associate of Science in Nursing degree.

F. Course Activities and Design

Course activities include: lectures, discussions, group activities, computerized learning programs, audiovisual programs, internet resources, drug calculation exercises, and/or written assignments. Key drugs or prototypical drugs, within a class, will be used to teach each of the drug classifications. Case studies will be used to help students apply knowledge and anticipate decisions they will be making in clinical practice regarding the administration of medications. Clinical math includes information, explanations, and practice needed to competently and confidently calculate drug dosages. A clinical math competency examination will be given to students. At least a score of 95% on this examination is expected in order for the students to be allowed to go to clinical for the NU105 course.

4. Course Prerequisite(s); Concurrent Course Enrollment

Prerequisites: Acceptance into the NMC Nursing Program
Concurrent Course Enrollment:NU105 or approval of the Nursing Department Chair

Required English/Mathematics Proficiency Level(s)

English Placement Level: EN202
Mathematics Placement Level: MA161

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 4-credit course, textbooks, course fee, BLS/CPR fee, student activities fee, physical exam, uniforms, required clinical equipment and supplies.

Cost to the College: Instructor’s salary

Instructional resources needed for this course include: videotaped materials, audio-visual programs/software, multimedia projector, pens, papers, markers, simulated medications, medication administration supplies, NMC Internet access, copier machine, copier paper and toner.

6. Method of Evaluation

Students will be evaluated based on quizzes, unit tests, final exam, and written assignments.

The Nursing Department utilizes the following grading scale to assign letter grades to grade percentages:

A: 92-100%
B: 84-91%
C: 75-83%
D: 60-74%
F: 00-59%

The student must have a final grade of “C” or higher (75% or higher) in order to pass the course.

NMC attendance policies will be followed.

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

1.0 Introduction
- 1.1 Pharmacology basics
- 1.2 Key concepts of pharmacokinetics, pharmacodynamics, and pharmacotherapeutics
- 1.5 Routes by which drugs are administered
- 1.6 Types of drug interactions and adverse reactions
- 1.7 Legal and ethical issues in the administration of medications
- 1.8 The Nursing Process in relation to drug administration
- 1.9 Drug reference

2.0 Blood Component Therapy
- 2.1 Procedure
  - 2.1.1 Equipment
    - 2.1.1.1 Blood or blood products
    - 2.1.1.2 Tubing with filter
    - 2.1.1.3 19-gauge needle for venous access
  - 2.1.2 Allergies or previous blood reactions
  - 2.1.3 Type and cross-match blood
  - 2.1.4 Blood group compatibility
- 2.2 Autologous transfusion
  - 2.2.1 Preoperative donation
  - 2.2.2 Iron supplements
  - 2.2.3 Benefits
  - 2.2.4 Contraindications
  - 2.2.5 Blood transfusion reactions

3.0 Intravenous (IV) Therapy
- 3.1 Parenteral fluids
  - 3.1.1 Definition of terms
  - 3.1.2 Types of IV fluids
  - 3.1.3 Administration
- 3.2 Peripheral IV
  - 3.2.1 Location
  - 3.2.2 Insertion of catheter
  - 3.2.3 Complications
- 3.3 Central Venous Access Devices (CVACs)
  - 3.3.1 Peripherally Inserted Central Catheter (PICC)
  - 3.3.2 Tunneled central catheter

- 3.3.3 Non-tunneled percutaneous central catheters
- 3.3.4 Implanted ports

4.0 Medications
- 4.1 Organizations of medications
  - 4.1.1 Classification system
  - 4.1.2 Sub-classification system
  - 4.1.3 Action or effect of the classification or sub-classification
  - 4.1.4 Therapeutic use for the medications in the classification or sub-classification
  - 4.1.5 Precautions or contraindications for use of that classification or sub-classification
  - 4.1.6 Adverse effects (more intense effects) of the action of the medications in the classification or sub-classification
  - 4.1.7 Evaluation of the effect or the medications in the classification or sub-classification
    - 4.1.7.1 Therapeutic or desired effect
    - 4.1.7.2 Non-therapeutic or undesired effect
  - 4.1.8 How to take medications safely

5.0 Medication Classifications
- 5.1 Autonomic nervous system drugs
- 5.2 Neurologic and neuromuscular drugs
- 5.3 Pain medications
- 5.4 Cardiovascular drugs
- 5.5 Hematologic drugs
- 5.6 Respiratory drugs
- 5.7 Gastrointestinal drugs
- 5.8 Anti-infective drugs
- 5.9 Anti-inflammatory, anti-allergy, and immunosuppressant drugs
- 5.10 Psychotropic drugs
- 5.11 Endocrine drugs
- 5.12 Drugs for fluid and electrolyte balance
- 5.13 Antineoplastic drugs
- 5.14 Other major drugs
- 5.15 Vaccines and treatment for biological weapons exposure
- 5.16 Treatment and antidotes for chemical weapons exposure

6.0 Adverse Effects of Medications
- 6.1 Anaphylaxis
- 6.2 Delayed allergic reaction

- 6.3 Dermatological reactions
- 6.4 Stomatitis
- 6.5 Super-infections
- 6.6 Bone marrow depression
- 6.7 Liver impairment
- 6.8 Renal impairment
- 6.9 Ocular impairment
- 6.10 Auditory impairment
- 6.11 CNS impairment
- 6.12 Anticholinergic effects
- 6.13 Parkinson-like effects

7.0 Calculating Medication Dosages Safely
- 7.1 Math review
- 7.2 Introduction to dimensional analysis
- 7.3 Measurements and conversions
- 7.4 Medication administration and medication orders
- 7.5 Medication labels
- 7.6 Oral and injected dosages
- 7.7 Reconstitution
- 7.6 Weight and Body Surface Area (BSA) based dosages
- 7.7 Intravenous (IV) therapy
- 7.8 Enteral tube feedings
- 7.9 Insulin and heparin administration
- 7.10 Critical care dosage calculations

8. Instructional Goals

The course will introduce students to:

1.0 Basic pharmacological principles of pharmacokinetics, pharmacodynamics, and pharmacotherapeutics that are essential to the safe administration of medications;

2.0 Drug classifications and actions, indications, dosage ranges, therapeutic uses, adverse effects, drug interactions of the common classes of drugs, and nursing considerations;

3.0 Key or prototype drugs and how to make inferences about other drugs in the same drug classifications;

4.0 Legal and ethical issues in the administration of medications;

5.0 Calculation of medication dosages for clinical practice;

6.0 The nursing process in relation to administration and evaluation of the therapeutic use of drugs; and

7.0 The use of drug references to secure information concerning unfamiliar drugs and how to apply this information appropriately in a clinical setting.

9. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1.0 Explain the pharmacological principles of pharmacokinetics, pharmacodynamics, and pharmacotherapeutics that are essential to the safe administration of medications;

2.0 Demonstrate knowledge of drug classifications and the actions, dosage ranges, therapeutic uses, adverse effects, and drug interactions of the common classes of drugs;

3.0 Apply the knowledge of prototype drugs or drug groups to unfamiliar agents, and use this information to infer probable characteristics, actions, and adverse reactions of new agents in that group;

4.0 Identify the legal and ethical issues in the administration of medications;

5.0 Calculate medication dosages;

6.0 Utilize the nursing process in relation to administration and evaluation of the therapeutic use of drugs through case studies; and

7.0 Use drug references to secure information concerning unfamiliar drugs and how to apply this information appropriately given in a clinical situation.

10. Assessment Measures of Student Learning Outcomes

Assessment of student learning may include, but not be limited to, the following:

1.0 Quizzes;

2.0 Unit Tests;

3.0 Final Exam;

4.0 Written Assignments; and

5.0 Clinical math competency examination score of 95% for students to be allowed to go to clinical for the NU105 course.