I. TITLE OF COURSE: Pharmacological Aspects
Code & Number: NURS 1130
Credits: Three (3)

II. DESCRIPTION
Discussion of the relevant aspects of the study of Pharmacology, including the concepts of biochemistry, research and legal aspects. Utilization of the principles and skills of Posology. Application of the Nursing Process in the administration of medication. Requires a total of 45 hours of conference, and 30 hours of open laboratory. Concurrent with NURS 1121.

III. Terminal and Specific Objectives
At the end of the unit the student will be able to:
1. Discuss general concepts of pharmacology and implications for safe nursing practice.
   1.1 Summarize briefly, the historical development of pharmacology.
   1.2 Compare and contrast terms related to pharmacology.
   1.3 Identify drug regulations that have ensured the safety and efficacy of medications.
   1.4 Explain how drugs are categorized.
   1.5 Differentiate between drug’s generic names, trade names, chemical names, generic equivalent and it’s implication to nursing clinical practice.
   1.6 Explain the U.S. Controlled Substance Act of 1970, the five schedules and DEA role in controlling drug abuse and misuse.
   1.7 Discuss the role of pharmacology in the prevention and treatment of conditions that may develop in the content of biological, chemical, or nuclear attack.
   1.8 Explain the application of pharmacokinetic to clinical practice.
   1.9 Examine the mechanism by which drugs affect clients.
   1.10 Apply principles of pharmacodynamics to clinical practice.
   1.11 Discuss factors which could affect pharmacodynamics.
   1.12 Mention clinical manifestations of reactions to medications.
   1.13 Differentiate between an agonist, a partial agonist and an antagonist.
   1.14 Define drug therapeutic categories that affect the functional health patterns.
   1.15 Examine the role of herbal therapies in the prevention and treatment of diseases.
   1.16 Identify the factors that contribute to the errors in the administration of medication and its impact in clinical practice.
1.17 Identify strategies for reducing medication errors.
1.18 Discuss the importance of research in pharmacology.

2. **Use principles and skills of administration of medication and posology to deliver medication safely and effectively.**
   2.1 Interpret drug orders that contain abbreviations.
   2.2 Interpret drug labels to ensure safe administration of medications.
   2.3 Compare and contrast the three systems of measurements used in pharmacology.
   2.4 Demonstrate precision and safety in dosage calculation and drug administration, with patients in different stages of growth and development.
   2.5 Demonstrate correct techniques of: oral, parental, and non-parental medication administration.
   2.6 Transcribe and document medications orders correctly.

3. **Apply the Nursing Process with a humanistic focus in the safe administration of medication.**
   3.1 Discuss the roles and responsibilities of the nurse in delivering medications safely and effectively.
   3.2 Explain how the five rights of drug administration affect client safety.
   3.3 Discuss essential elements of nursing assessment, pertaining to Pharmacology.
   3.4 Identify Nursing diagnosis related to the administration of medication, using NANDA taxonomy as a reference.
   3.5 Selection of attainable short and long-term goals during the administration of medications, using NOC (Nursing Outcomes Classification) as a reference.
   3.6 Select therapeutic interventions during drug administration, using NIC as reference (Nursing Intervention Classification).
   3.7 Apply geriatric and pediatric considerations in the administration of medications.
   3.8 Evaluate therapeutic response, secondary effects, and adverse reactions.

IV. **Content**

A. **General concepts of Pharmacology**
   1. Background History of Pharmacology
   2. Definition of terms
      a. Pharmacology
      b. Therapeutics
      c. Pharmacotherapy
      d. Drugs
      e. Medication
      f. Biologics
      g. Complementary and alternative therapies
3. Drug regulation
   a. Formulary
   b. Pharmacopoeia
   c. Regulatory Acts
   d. Food and Drug Administration
   e. Drug approval process

4. Drug categories
   a. Therapeutic classification
   b. Pharmacological classification

5. Names of medications
   a. Chemical
   b. Generic
   c. Commercial
   d. Generic equivalent
   e. Bioavailability of the drug

6. Substance Control Act
   a. Purpose
   b. Schedule
   c. DEA Role

7. Health effects of biological and chemical agents
   a. Bioterrorism
   b. Potential chemicals and biological agents
   c. Role of nursing in emergency preparedness
   d. Strategic National Stockpile

8. Pharmacokinetics of medications
   a. Pharmacokinetics
   b. Transport of drugs
      i. diffusion or passive transport
      ii. active transport
   c. Categories and factors that affect pharmacokinetics
      i. absorption
      ii. distribution
      iii. biotransformation
      iv. elimination
   d. Therapeutic response
      i. plasma drug levels
      ii. duration of action
      iii. loading and maintenance doses

9. Mechanisms by which drugs affect clients
   a. Pharmacodynamics
   b. Therapeutic index and drug safety
   c. Response and therapeutic relationship
   d. Potency and Efficacy
   e. Cell receptors
f. Factors that alter or interfere with the action of medications
   i. age
   ii. physical factors
   iii. pathological factors
   iv. time and route of administration

10. Medication reactions
    a. Agonist and Antagonist
    b. Secondary effect
    c. Adverse reactions
    d. Tolerance and dependence
    e. Cumulative effect
    f. Iatrogenic reaction
    g. Allergic reaction
    h. Incompatibility
    i. Chain reaction
    j. Toxicity
    k. Teratogenic
    l. Carcinogenic
    m. Idiosyncratic reaction

11. Therapeutic categories of the functional health patterns
    a. Pattern: Nutritional-metabolic
       i. antiemetics
       ii. vitamins
       iii. antiacids
       iv. hypoglycemics
       v. placebos
    b. Pattern: Elimination
       i. laxatives
       ii. antidiarretics
       iii. diuretics
    c. Pattern: Perception-management
       i. antiviral
       ii. antibiotic
    d. Pattern: Cognitive-perceptive
       i. analgesic
       ii. anesthetic
       iii. antipyretic
       iv. narcotic
       v. tranquilizer
    e. Pattern: Activity-exercise
       i. anti-inflammatory
       ii. antihypertensive
       iii. cardiovascular
       iv. anticoagulants
       v. thrombolytic
vi. bronchodilator
vii. expectorant
viii. decongestant
ix. antitussive
x. antihistamine

12. Herbal therapy
   a. Characteristics
   b. Supplements
   c. Regulation
   d. Pharmacological actions and safety of herbal products

13. Medication errors prevention
   a. Medication error
   b. Factors that contribute to medication errors
   c. Impact of medication errors
   d. Strategies for reducing medication errors

14. Importance of research in pharmacology

B. Principles and skills of drug administration and posology
   1. Interpreting the language of Prescription
   2. Drug labels and Packaging
   3. Systems of Measurement
   4. Drug Preparations and Equipment to Measure Doses
   5. Oral and Topical Medications
      a. Calculation of Solids and Liquids
      b. Oral, Skin and Mucous Membrane Route of Administration
   6. Parenteral route
      a. Liquids for Injections
      b. Parenteral route & administering injections
   7. Intravenous drip
      a. Calculation of basic IV drip rates
      b. Special Types of Intravenous Calculation
   8. Dosage Problem for infant and children
   9. Transcription and documentation of medication administration

C. Nursing process in the safe administration of medication
   1. Role and responsibility of the nurse in the administration of medications
   2. The five rights and the impact on safety medication administration
   3. Assessment
      a. medication history
      b. allergies
      c. medication information
      d. diet
      e. mental & physical condition
      f. stage of growth & development
      g. attitudes & needs
4. Nursing Diagnosis- NANDA
5. Planning
   a. Goals & objectives in medication therapy (NOC)
6. Intervention
   a. Transcribing medical orders (NIC- 8060)
   b. Medication management (NIC-2380)
   b. Documentation in Kardex
   c. Correct and ten golden rules of administration
   d. Ethical-legal aspect
   e. Family and patient education
   g. Medication administration
      i. oral (NIC 2308)
      ii. topical
         (1) ear (NIC-2308)
         (2) eye (NIC-2310)
         (3) inhalation (NIC- 2311)
         (4) nasal (NIC-2320)
         (5) rectal (NIC-2315)
         (6) skin (NIC-2316)
         (7) vaginal (NIC-2318)
      iii. parenteral
         (1) intradermal (NIC-2312)
         (2) subcutaneous (NIC-2317)
         (3) intramuscular (NIC-2313)
         (4) intravenous (NIC 2314)
7. Evaluation
   a. Therapeutic effect
   b. Secondary effect
   c. Adverse effect

V. Activities
A. Large group discussions
B. Small group discussions
C. Assignments
D. Module
E. Videos
F. Assigned reading
G. Independent study
H. Computer lab
I. Skills lab
J. Guidelines for open laboratory
VI. Evaluation Strategies

Pharmacology
A. Special Assignments - 5%
B. Two (2) Partial Tests – 20%
C. Final Test – 15%
D. Pre & Post ERI Test – Pharmacology in Clinical Nursing 9.4.1 – 0%

Posology
A. Five (5) Partial Tests – 40%
B. Open lab activities – 20%
C. Pre & Post ERI Test – Clinical Calc & Classification 9.3.4 – 0%

VII. Educational Resources

Required Text:


VIII. Other References

Books


Modules

http://symposia.ashp.org/medsafety/overview.htm

Web Sites

*Food and Drug Administration.*
www.fda.org

*Institute for Medication Practice.*
www.ismp.org

*U.S. Pharmacopeia.*
www.usp.org

Videos

*V- Avoiding Medication Errors.*
*V- Basic Principles.*
*V- Safe Medication Administration.*
*V- Subcutaneous Injection- a guide to correct technique.*
*V-0677 With Care and Caring Pediatric Medication Administration.*
*V-0944 Drugs: How they Affect Body Chemistry.*
*V-2275 EZ Pharmacology.*
*V-2326 Medication Administration Guidelines.*
*V-2327 Administrering Medication by Nonparenteral Routes.*
*V-2328 Administering Medications by Injection.*
*V-2329 Administering Medications by IV.*
*V-3115 Injections.*
*V-3119 Preventing Medication Errors.*
*V-3120 Intravenous Medications.*