COURSE TITLE: Pharmacology (for Nursing and Health Fields)
COURSE NUMBER: Biology 202

1. NAME OF COURSE:
Pharmacology (for Nursing and Health Fields)

2. NAME OF ORIGINATOR:
Gary J. Bernardi, M.D.

3. CURRENT DATE:
Spring 2008 (New Course)

4. NUMBER OF CREDITS:
3

5. NUMBER OF CONTACT HOURS PER WEEK:
3

6. APPROXIMATE FREQUENCY OF OFFERING THIS COURSE:
Every semester

7. PREREQUISITES OR ENTRY LEVEL SKILLS:
Anatomy and Physiology I

8. COREQUISITES:
None

9. PLACE OF THIS COURSE IN CURRICULUM:
Elective

10. IS THIS COURSE DESIGNED FOR TRANSFER:
Yes

11. COURSE LEARNING OBJECTIVES AND METHODS OF ASSESSMENT:
See attached
<table>
<thead>
<tr>
<th>Objective: Upon successful completion. The student will be able to:</th>
<th>The outcome will be measured by one or more of the following:</th>
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<tbody>
<tr>
<td><strong>Lecture</strong></td>
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<tr>
<td><strong>Principles of Pharmacology</strong> Define drug, pharmacology, toxicology, pharmaceutical chemistry, and pharmacy Define pharmaceutical phase of pharmacology.</td>
<td><strong>Principles of Pharmacology</strong> Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions.</td>
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<tr>
<td>Define pharmacokinetic phase of pharmacology. Explain those factors that influence the absorption, distribution, biotransformation, and elimination of drugs.</td>
<td>Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions. Interpretation of graphs and tables.</td>
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<td>Define pharmacodynamic phase of pharmacology. Define pharmacologic receptor and explain the mechanisms of action of agonists and antagonists at the receptor site.</td>
<td>Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions. Interpretation of graphs and tables.</td>
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<td>Briefly describe neurochemical transmission at the synapse. Explain the pharmacologic actions of synaptic mimicry and blockade.</td>
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<td><strong>Autonomic Nervous System Drugs</strong> Describe the structural and functional characteristics of the Autonomic Nervous System.</td>
<td><strong>Autonomic Nervous System Drugs</strong> Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions.</td>
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<td>Describe the mechanism of action of cholinergic and anticholinergic drugs. Explain the use of cholinesterase inhibitors in myasthenia gravis. Name other indications, contraindications and adverse reactions of cholinergic and anticholinergic drugs.</td>
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<td>Describe the mechanism of action of adrenergic and antiadrenergic drugs; list their indications, contraindications, adverse reactions and precautions.</td>
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<td><strong>Central Nervous System Drugs</strong> Describe the structural and functional characteristics of the Central Nervous System. Describe the pharmacologic activity of the drugs used in the treatment of Parkinson’s disease, Alzheimer’s disease and multiple sclerosis. List the contraindications, precautions, and adverse reactions.</td>
<td><strong>Central Nervous System Drugs</strong> Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions.</td>
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<td>Describe the pharmacologic activity of drugs used in the treatment of epilepsy, muscle spasm and spasticity. List the contraindications, precautions and adverse reactions.</td>
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<td>Describe the pharmacologic activity of the various psychotherapeutic agents and explain their role in the treatment of schizophrenia, depression, mania, bipolar disorder and anxiety. Outline the mechanism of action of sedative-hypnotic drugs. List the contraindications, precautions and adverse reactions of the psychotherapeutic and hypnotic agents. Briefly describe the pathophysiology of pain Explain how anesthetics (local and general) and analgesics (opioid and nonopioid) are used in pain management; list their contraindications, precautions and adverse reactions. Explain how opioid antagonists work.</td>
<td>Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions.</td>
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<td>Define drug abuse. List the factors that contribute to drug abuse. Briefly explain the neurobiology of addiction. Describe the scheduling of drugs under the Controlled Substance Act (1970).</td>
<td>Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions.</td>
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<td><strong>Cardiovascular System Drugs</strong> Describe the mechanisms of action of the various cardiotonic, antianginal, diuretic, antihypertensive, antihyperlipidemic, antiarrhythmic, antithrombotic, and thrombolytic drugs; list several contraindications, precautions, and adverse reactions of each.</td>
<td><strong>Cardiovascular System Drugs</strong> Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions.</td>
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<td><strong>Immune System Drugs</strong> Differentiate between natural and acquired immunity. Explain the mechanisms of action of anti-inflammatory (steroidal and non-steroidal) drugs. List their indications, contraindications, precautions, and adverse reactions. Explain the mechanisms of action of antiallergic drugs. List their indications, contraindications, precautions, and adverse reactions. Explain the pharmacologic activity of antihistaminic (H1 and H2) drugs. List their indications, contraindications, precautions, and adverse reactions.</td>
<td><strong>Immune System Drugs</strong> Knowledge and understanding of the material will be tested in the form of multiple choice, true/false, diagram, matching, and completion questions.</td>
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<td>Endocrine System Drugs</td>
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<td>List the various hypothalamic and pituitary hormones and explain how these hormones as well as their synthetic analogs can be used to treat various endocrine disorders. Explain the pathophysiology underlying specific pancreatic, thyroid and adrenocortical disorders (e.g. diabetes mellitus, hypo- and hyperthyroidism, Cushing’s disease, Addison’s disease, etc.) Describe the pharmacologic activity of the drugs used in these disorders; list their contraindications, precautions and adverse reactions. List the three major categories of sex hormones and explain how they are used to promote women’s and men’s health.</td>
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<td>Explain the pathophysiology underlying rheumatoid arthritis and gout. List the drugs used in the treatment of these disorders, give their mechanisms of action, their contraindications, precautions, and adverse reactions. Explain the pharmacologic activity of drugs that affect calcium homeostasis and bone metabolism.</td>
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<td>Explain the pathophysiology of asthma. List the drugs used to treat asthma, allergic rhinitis, coughs and colds. Explain their pharmacologic activity and list the contraindications, adverse effects and precautions.</td>
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<td>Explain the pathogenesis of peptic ulcer disease and the therapeutic options for treating this disease. Describe how antiemetics, antidiarheal, and laxatives work. List the dangers of laxative abuse. Define irritable bowel disease and indicate the pharmacological options for treating ulcerative colitis and Crohn’s disease.</td>
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<td>List several factors that determine the selection of an antibacterial drug. Differentiate between bacteriostatic and bactericidal drugs Name the classes of antibacterial agents, give examples of each, and describe their mechanisms of action. List their indications, contraindications, precautions, and adverse reactions Define drug resistance. Explain the mechanisms by which microorganisms can become resistant to antibiotics. Describe the mechanisms of action of prototypical antiviral, antifungal, antiprotozoal, and anthelmintic drugs. List their indications, contraindications, precautions, and adverse reactions.</td>
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<td>Define neoplasm. Describe the stages of the cell cycle. Differentiate between cell-cycle specific and cell-cycle nonspecific drugs. Name the major classes of antineoplastic drugs and give examples of each. List their indications, contraindications, precautions, and adverse reactions Explain how resistance to chemotherapeutic drugs develop.</td>
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<td>Define immunomodulator Name and give examples of immunosuppressants and immunostimulants. Explain their mechanisms of action. List their indications, contraindications, precautions, and adverse reactions.</td>
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12. COURSE GRADE

The course grade will be based on student performance on unit exams, quizzes and comprehensive final.

13. INSTRUCTIONAL METHODS

1. Traditional lecture with the use of chalkboard
2. Overhead transparencies
3. Smart Boards
4. Power point presentation
5. Internet

14. COURSE-CURRICULAR OPPORTUNITIES

A. The course introduces the student to the science of pharmacology, its contributions and its niche among the allied health sciences.
   Measurement: unit examinations; quizzes; comprehensive final

B. The course encourages the student to be able to gather information from multiple disciplines, such as anatomy, physiology, microbiology and pathology. The integration of information enables the student to understand and appreciate the value of individual drugs as treatment modes.
   Measurement: unit examinations; quizzes; comprehensive final

C. The course invites the student to think deductively so as to appreciate the role drugs play in altering the physiology and pathology of the human body.
   Measurement: unit examinations; quizzes; comprehensive final

D. The lectures in pharmacology allow the student to coordinate efforts as well as material with other students. This environment helps develop interactive skills and promotes intellectual growth.
   Measurement: unit examinations; quizzes; comprehensive final

15. TOPIC OUTLINE

See attached

16. UNIQUE ASPECTS OF COURSE

NA

APPENDIX I

See attached

APPENDIX II

See attached
15. PHARMACOLOGY OUTLINE

I. Principles of Pharmacology
   A. Pharmaceutics
   B. Pharmacokinetics
   C. Pharmacodynamics

II. Autonomic Pharmacology
    A. Cholinergic agonists
    B. Cholinergic antagonists
    C. Adrenergic agonists
    D. Adrenergic antagonists

III. Central Nervous System Drugs
     A. Drugs used to treat neurodegenerative disorders (Parkinson’s, Alzheimer’s, multiple sclerosis)
     B. Anticonvulsants
     C. Antipsychotic agents and their use in schizophrenia
     D. Drugs used to treat depression and mania
     E. Drugs for bipolar disorder
     F. Sedative-Hypnotic drugs
     G. Management of anxiety disorders
     H. CNS stimulants
     I. Drugs for pain
        1. Local and general anesthetics
        2. Opioid and nonopioid analgesics
        3. Opioid antagonists
     J. Drug abuse
        1. Controlled Substance Act (1970)
        2. Alcohol and other drugs of abuse
        3. Principles of addiction treatment

IV. Cardiovascular System Drugs
    A. Antihypertensive drugs
    B. Antiarrhythmic drugs
    C. Drugs used to treat CHF
    D. Diuretics
    E. Antianginal drugs
    F. Antihyperlipidemic drugs
    G. Anticoagulant, fibrinolytic, and antiplatelet drugs
    H. Drugs used to treat anemia

V. Immune System Drugs
    A. Anti-inflammatory drugs (steroidal and nonsteroidal)
    B. Antiallergic drugs
    C. Antihistaminic drugs
VI. Endocrine System Drugs  
   A. Hypothalamic and pituitary hormones (synthetic analogs)  
   B. Thyroid and antithyroid drugs  
   C. Sex steroids and reproductive drugs  
   D. Corticosteroids and inhibitors  
   E. Insulin and oral hypoglycemics  

VII. Musculoskeletal System Drugs  
   A. Drugs used to treat gout and rheumatoid arthritis  
   B. Drugs affecting calcium levels and bone mineralization  

VIII. Respiratory System Drugs  
   A. Drugs for asthma, allergic rhinitis, cough, and colds  

IX. Gastrointestinal Drugs  
   A. Drugs to treat peptic ulcer disease  
   B. Antiemetic drugs  
   C. Drugs used in the treatment of ulcerative colitis and Crohn’s disease  
   D. Antidiarrheal agents  
   E. Laxatives and laxative abuse  

X. Antimicrobial Drugs  
   A. Antibacterial drugs  
   B. Antiviral drugs  
   C. Antifungal drugs  
   D. Antiprotozoal drugs  
   E. Anthelmintic drugs  
   F. Drugs used to treat tuberculosis  

XI. Antineoplastic Drugs  
   A. Alkylating agents  
   B. Antibiotics  
   C. Antimetabolites  
   D. Hormones and related agents  
   E. Mitotic inhibitors  
   F. Monoclonal antibodies  

XII. Immunomodulators  
   A. Immunosuppressants  
      1. Antibiotics  
      2. Cytotoxic Drugs  
      3. Enzyme Inhibitors  
      4. Corticosteroids  
      5. Antibody Reagents  
   B. Immunostimulants  
      1. Interferon
APPENDIX I

Text: Pharmacology for Nursing Care (latest edition)
Author: Richard A. Lehne
Publisher: Elsevier
APPENDIX II

Course description:

Biol 202    Pharmacology (for Nursing and Health Fields)    3 credits

This course guides the student through fundamental principles of pharmacology. Topics include: pharmaceutics, pharmacokinetics, and pharmacodynamics. Focus is on drug classification and the prototypical drug of each class. Special emphasis is given to drug indications, contraindications, interactions, precautions, and adverse reactions. This course will enable health care professionals to apply pharmacologic information to clinical practice allowing for safe and effective drug therapy.