

PHCL 501 THERAPEUTICS I (3+1)
PHCL 502 THERAPEUTICS II (3+1)
PHCL 503 THERAPEUTICS III(3+1)

A. COURSE DESCRIPTION:

The Therapeutics Courses I,II and II are post-graduate pharmacy courses designed to provide students with an opportunity to apply their knowledge of the basic pharmaceutical sciences and to obtain new information about rational drug therapy to promote the practice of patient oriented pharmacy.

The courses consist of both lectures and conferences. Students will gain an understanding of rational drug therapy in the treatment of selected diseases; problems associated with implementing rational drug therapy; how therapy concepts correlate with the pathophysiology of the disease; and the monitoring tools necessary for evaluation of drug therapy. Students will be expected to correlate the findings of case study with the drug therapy and disease.

B. COURSE OBJECTIVES:

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

1. Discuss pathophysiology of selected diseases, including pathogenesis, signs and symptoms and common laboratory findings as well as complicating factors.
2. Apply knowledge of pertinent chemical, physical, and pharmaceutical properties of drugs as they relate to drug disposition, stability and handling when evaluating therapeutic regimens.
3. Apply pertinent pharmaceutical principles when evaluating a therapeutic problem such as adjustment of the dose or regimen for certain drugs in the presence of renal or liver dysfunction or other diseases affecting drug absorption or disposition.
4. Evaluate day-by-day multiple drug therapy with particular attention placed on the pharmacist's role in recognizing and monitoring for drug efficacy and giving alternative treatment plans.
5. Utilize common clinical laboratory tests and evaluate their usefulness in monitoring the progress of the disease and/or drug therapy.
6. Assess the multiple factors which affect the patient's response to drug therapy regimens.
7. Use the information from the biomedical and pharmaceutical literature to evaluate and solve problems concerning drug therapy.
8. Read and interpret information found in medical records and create a pertinent data base in a problem-oriented manner.

9. Develop communication skills both formal and informal with peers, other health professionals, and patients. Students will demonstrate an ability to gather, organize and articulately present material in response to drug-use questions.
10. Understand the role of other health professionals with whom the pharmacist interacts in patient care and develop a sense of the pharmacist's role as member of the health care team.

C. COURSE FORMAT

Advanced Therapeutic I, II and III will consist of three 1 hr lectures and 3-hour conference per week. Selected topics from diseases of major organ systems will be presented each week followed by conference discussions the following week to enhance understanding of the topic presented through case history analysis.

D. CONFERENCE GUIDELINES:

Conferences are designed to allow students to discuss the topic presented the previous week in lecture. An abstract of a patient's case history is used as part of the discussion. During the conference, aspects of the lectures are blended with the findings and development of the case study with particular emphasis being placed on the contribution that a pharmacist can make. Areas for discussion each week will include:

- a) presentation of the case study-summary of pertinent positive and negative findings; special observations, findings or considerations of the case study.
- b) drug monitoring parameters - means by which the pharmacist should monitor drug therapy, ADR, SE, and the progress of the disease as it relates to the specific case study and the drug therapy/disease in general.
- c) rational/irrational therapy-alternatives to the therapy in the case study; advantages and disadvantages to alternative therapy; dosing considerations.
- d) patient education and considerations - factors that should be considered when preparing and providing patient counseling; issues surrounding compliance and ways to encourage it.

PHCL 501 ADVANCE THERAPEUTICS - I (3 + 1)

<u>WK #</u>	<u>TOPIC OF THE WEEK</u>
1	Orientation
2	Cardiac arrhythmia (I)
3	Cardiac arrhythmia (II)
4	Pediatric respiratory diseases
5	Chronic complications of D.M.
6	Hyperlipidemia
7	Acute MI/CHF
8	Hypertensive crisis
9	Thrombolytic therapy
10	Midterm Exam.
11	Hepatitis
12	Viral and parasitic infections
13	Neoplastic diseases and pain management.
14	Pediatric neoplastic disorders
15	Study week
16	Final exam. week

PHCL 502 - ADVANCED THERAPEUTICS II
TEXT BOOK: APPLIED THERAPEUTICS 5TH EDITION

<u>Topics</u>	<u>Reading</u>
1. COR pulmonale and pulmonary HTN	Ch.16 & Ref.
2. Acid-base disorders	Ch.29
3. Acute complications of DM	Ch.72 & Ref.
4. Adult parenteral nutrition	Ch.30
5. GI infection & Intra-Abdominal infections	Ch.39,40
6. Inflammatory bowel ds	Ch.20
7. Immun. def. infections	Ch.46
8. AIDS	Ch.47
9. Gout and hyperuricemia	Ch.74
10. Connective tissue disorders	Ch.76
11. Acute & chronic renal failure	Ch.25
12. Renal dialysis	Ch.23

PHCL 503 - ADVANCED THERAPEUTICS III
TEXT BOOK: APPLIED THERAPEUTICS 5TH EDITION

	<u>Topics</u>	<u>Reading</u>
1.	General pediatric therapy	Ch.77
2.	Neonatal therapy	Ch.78
3.	Geriatric therapy	Ch.79
4.	Viral & parasitic infections	Ch.48,49
5.	Surgical antibiotic prophylaxis	Ch.35
6.	CNS infections	Ch.36
7.	Endocarditis	Ch.37
8.	Bone and skin infections	Ch.45
9.	Intensive care therapeutics	Ch.12
10.	Pediatric nutrition	Ch.32
11.	Drug-induced pulmonary disorder	Ch.18
12.	Respiratory tract infections	Ch.38

PHCL 505 (2+0) - CLINICAL IMMUNOLOGY

Course Description

This graduate course is intended to provide the student with a review of the essential fundamentals of immunology. The course will provide clinical experience with emphasis on how the body defend infections, prevention of diseases by immunization, deficiencies of the immune system, disorders mediated by immunologic mechanisms as well as immunologic techniques frequently used in the clinical laboratory. A summary of the major concepts of each lecture will be provided along with a set of questions that emphasize the major points.

Objectives

Upon completion of this course, the graduate student should be able to:

- 1) Recognize the principles involving the antibody- mediated immune response.
- 2) Differentiate between the immune response mechanisms.
- 3) Appreciate the different antigens e.g., bacteria, virus, cell-surface, autoantigens, and their fate.
- 4) Recognize the types and functions of the immunoglobulin isotypes and their clinical significance.
- 5) Differentiate between the T-cell products such as interleukins, interferons, and their clinical role.
- 6) Appreciate the types of immunization procedures (active and passive) and their uses as well as their adverse consequences.
- 7) Know the common defects in the immune system, their mechanisms e.g., AIDS and congenital immune defect.
- 8) Correlate between inflammatory responses as a consequence of different immune reactions (Types I-IV hypersensitivity).
- 9) Enumerate the blood groups of humans and their relationship to hemolytic disorders.
- 10) Understand mechanisms and clinical picture of autoimmunity and to illustrate cases of selected auto- immune diseases such as Thyroiditis, Systemic lupus erythematosus, Rhymatoid Arthritis and Myasthenia Gravis.

PHCL 510 ADVANCED CLINICAL PHARMACOKINETICS (1+1) 2

OBJECTIVE

This course is designed to acquaint the student with the fundamental concepts of clinical pharmacokinetics, particularly during chronic drug therapy. This understanding is of importance in view of:

a) Changes in dosage requirements due to the changes in the state of the patient during course of the disease.

b) Changes in hepatic and renal function that require adjustment in dosage regimens. A knowledge of these principles is necessary to select a drug product or to suggest a dosage regimen for an individual patient.

1. Bioavailability (2 weeks)

- rate and extent of absorption
- methods of estimation
- effect of food
- disease states
- digoxin example
- phenytoin example
- problem solving

2. Clearance (2 weeks)

- physiology
- concepts
- hepatic blood flow, propranolol example
- effect of various factors
- Michaelis-menton kinetics
- problem solving

3. Protein binding (1 week)

- effect of various factors
- levels and volume of distribution
- drug elimination
- methodology
- problem solving

4. Detoxification and dialysis (1 week)

- kinetics factors
- effect of disease
- hemodialysis
- problem solving

5. Volume of distribution (1 week)
 - concepts
 - various terms and their implications
 - disease states
 - problem solving
6. Pharmacodynamics (1 week)
 - concepts
 - models
 - selecting a model
 - problem solving
7. Drug interactions (1 week)
 - gastrointestinal absorption
 - protein binding
 - metabolism - induction or inhibition
 - renal excretion
 - disease states
 - problem solving
8. Model-independent kinetics (1 week)
 - statistical moment theory
 - problem solving
9. Use of computer in modeling (1 week)
 - NONLIN
 - SIMKIN
 - other packages

PHCL 511 THERAPEUTIC DRUG MONITORING I (0 + 3)

A: Course Description

This course is designed to provide the student with experience in applying both theory and practical principles of clinical pharmacokinetics in patient care setting.

The course consists of short introductory session, monitoring patients and discussions in the ward areas.

B: Course Objectives

Upon successful completion of this course, student shall be able to:

1. Conduct pharmacokinetic and pharmacodynamic assessment of patients receiving drugs that have a narrow therapeutic index or marked variability in their disposition.
2. Define monitoring parameters to include drug concentrations as well as therapeutic endpoints for safe and efficacious use of each drug administer to patients.
3. Devise an initial dosage regimen and monitoring strategy using pharmacokinetic principles and methods for drugs with a narrow therapeutic range or marked variability in their disposition.
4. Assess and monitor the clinical pharmacokinetic parameters of drugs with a narrow therapeutic range or marked variability in their disposition; evaluate patient-specific pharmacokinetic parameter(s) and recommend modifications in drug therapy based upon the changes in the patients condition that alter drug pharmacokinetics.
5. Integrate pharmacokinetics and pharmacodynamics with the pathophysiology of a patients disease.
6. Monitor patients for adverse drug reactions and toxic responses using pharmacokinetic principles and measured drug concentrations.
7. Demonstrate competency in devising individualized dosage regimens using pharmacokinetic models and various support systems (e.g. hand-held calculators androcomputers.
8. Recommend appropriate blood sampling times and analytical methodologies for individualizing patient drug therapy.

PHCL 512 THERAPEUTIC DRUG MONITORING II (0+3)

A: Course Description

This course is design to provide the student the knowledge, both theoretical and applied in the use of statistics in the practice of clinical pharmacokinetics. In addition, the student will understand how to initiate, implement and evaluate clinical pharmacokinetic service in a existing health care institution.

B: Course Objectives

On successful completion of the this course, student shall be able to:

1. describe the theory, methodology and relative cost of the various assay procedures used for TDM.
2. Apply Bayesian principles or population pharmacokinetics and analysis in clinical pharmacokinetic assessments.
3. Use statistical approaches, pharmacokinetic models, and methods of application to patient-specific data bases for computerized and non computerized dosing algorithms used in clinical pharmacokinetic practice.
4. document cost-effective, cost-benefit and risk-benefit of clinical pharmacokinetic practice.
5. Perform audits to evaluate the dosage regimens, drug concentrations and the effectiveness of pharmacokinetic service in the institution.
6. to devise a plan for the initiation, implementation and evaluation of a clinical pharmacokinetic pharmacy- oriented practice.

PHCL 513 THERAPEUTIC DRUG MONITORING III

A. Course Description

This course is design to provide the student the knowledge and experience to initiate, implement and evaluate clinical pharmacokinetic service in a existing health care institution.

B. Course Objectives

On successful completion of this course, student shall be able to:

1. document cost-effective, cost-benefit and risk-benefit of clinical pharmacokinetic practice.
2. Perform audits to evaluate the dosage regimens, drug concentrations and the effectiveness of pharmacokinetic service in the institution.
3. to devise a plan for the initiation, implementation and evaluation of a clinical pharmacokinetic pharmacy- oriented practice.
4. Plan, implement and evaluate the administrative aspects of clinical pharmacokinetic services at a given practice site.

PHCL 520 RESEARCH DESIGN (2 + 0)

Course Description

This course is designed to provide the student with the basic principles of conducting a research project.

Objectives

After completion of this course, the student should be able to:

1. Perform a complete literature review.
2. Develop skills in formulating a hypothesis and preparing a research proposal.
3. Comprehend the various techniques in practice research.
4. Select the appropriate statistical test for data analysis and make the corresponding inference.
5. Use statistical packages.

Course Contents

No. of lectures

1. Literature review:	1
- Purpose	
- Types of information	
- Sources	
- Keywords and terms	
2. Approaches to research:	1
- Statement of the problem	
- Purpose of hypothesis	
- Determining the purpose of the study	
3. How to write a research proposal	1
- Research proposal format	
4. Techniques in practice research:	
- Designing and conducting surveys	1
- Questionnaire design:	2
* Purpose	
* Relationship to goals, objectives and hypothesis.	
* Statistical analysis consideration	
- Clinical trials	2

-	Drug utilization evaluation	2	
-	Postmarketing surveillance		2
5.	Sampling:		3
-	Purpose		
-	Sampling techniques		
-	Sample size and power analysis		
6.	Data Management:		2
-	Collection		
-	Coding recording and processing		
-	Preparing data for analysis		
7.	Data Analysis:		
-	Choosing the appropriate statistical procedure.		8
8.	Statistical packages:		3
-	SPSS		
-	SAS		
-	BMDP		

PHCL 521 DRUG INFORMATION CLERKSHIP 0+3
Practical Training

1. Enquiry Answering:
 - Technique
 - Telephone technique
 - Question intake
 - Information sources
 - Search strategy
 - Formulating response / use of English
 - Communicating reply
 - Follow-up

2. Data Handling:
 - Storage and retrieval
 - Microcomputer

3. Literature Searching:
 - Library
 - In-house
 - On-line

4. Method of evaluating drug information systems.

5. Obtaining background information.

6. Abstracting and newsletter preparation.

7. Adverse reaction reporting and handling.

8. Evaluating drug information center.

9. Drug literature evaluation

10. Active Information:
 - Bulletins
 - Seminars
 - Lectures

11. Management:
 - Monitoring service and staff
 - Committee skills
 - Financial and budgeting.
 - Interviewing
 - Guidelines for submissions
 - Work planning.

12. Research:
 - Service development
 - Publications

PHCL 525 - ADVANCED DPIC LITERATURE EVALUATION (2 + 0)

COURSE DESCRIPTION

This course is designed to provide the student with practical experience in literature evaluation and how to read the medical literature.

OBJECTIVES

After completion of this course, the student should be able to:

1. Describe and evaluate difference literature retrieval systems.
2. Critically analyze and evaluate medical literature.
3. Define an adverse drug reaction (ADR) in general terms and as it pertains to institutional ADR surveillance.
4. Critically interpret claims and actions of promotional materials from pharmaceutical companies.
5. Develop basic skills in writing, critiques and reports

COURSE CONTENTS	ALLOCATED HOURS
1. Computerized data-bases	2
2. Bias in the medical literature	2
3. Evaluating a study:	
-Assignment	1
-Assessment of outcome	2
-Analysis	2
-Interpretation	1
-Extrapolation	1
-Exercises	1
4. Evaluating a test:	
-Variability of the test	1
-The range of normal	1
-Defining disease	1
-Diagnostic discrimination of tests	2
-Exercise	1
5. Evaluating a rate:	
-Sampling of rates	1
-Standardization of rates	2
-Sources of differences in rate	2
6. Adverse drug reaction surveillance and evaluation.	2
7. Evaluation of promotional literature	2

PHCL 530 ADVANCED HOSPITAL PHARMACY (3+0)

DESCRIPTION

The course is designed to present comprehensive principles of contemporary institutional pharmacy operational systems, e.g. a unit dose drug distribution system, etc. In addition, the course presents essential principles and techniques of purchasing, inventory control etc. used in institutional pharmacy practice settings.

COURSE OUTLINE

I. Introduction:

- a) Contemporary health care
 - .1 Focus upon hospital pharmacy practice
- b) Future projects of health care delivery systems.

II. Distribution Systems:

- a) Review of contemporary DSs being used
- b) Unit-Dose Distribution System:
 - .1 Performance standards and quality assurance/control.
 - .2 Computer applications
 - .3 Policies and Procedures:
 - a) Expiration dating
 - b) Repackaged pharmaceuticals

III. Decentralized Pharmacy Services

- a) Decentralized drug distribution:
 - .1 Satellite pharmacy services (SS)
 - a) Justification in budget
 - b) Planning and implementing SSs.
 - c) Operational policies and procedures
- b) Intravenous Admixture Services:
 - a) Work analysis and budget justification of an admixture service.
 - b) Planning and implementing specialized services in the

Admixture program:

- .1 Operational system for preparing total parenteral Nutrition solutions (TPNs).
- .2 Home parenteral nutrition program
- .3 antineoplastic admixture services .
- .4 Pediatric intravenous admixture services

c) Policies and Procedures:

- .1 Laminar-flow
 - a) Special considerations for types of LF hoods:
 - i) Vertical
 - ii) Horizontal
 - b) Controls of the aseptic processing environment.
 - c) Laminar-flow equipment maintenance and certification.
- .2 Establishment of quality control and quality assurance criteria and compliance standards.
- .3 Pharmacy coordination of infusion device evaluation.

V. Ambulatory/Outpatient Services:

a) Policies and Procedures:

- .1 Establishing guidelines for selecting suppliers
- .2 Systems analysis and assessment of vendors and drug product selection:
 - a) Bid solicitation and contract negotiation
 - b) Evaluation of drug procurement alternatives
 - c) Establishing quality assurance standards for purchasing functions.

b) Policies and Procedures for Inventory Control:

- .1 Establishing guidelines for developing and coordinating an integrated purchasing process with an effective inventory control process.

- .۲ Systems analysis and assessment of various methods to employ in controlling inventory.
 - .۳ Use of quantitative measurements of inventory control to assure compliance with established quality assurance standards.
- c) Automated data base management and information systems for purchasing and inventory control.

VII. Pharmacy and Therapeutic Committee

- a) Planning and implementing a P&T Committee:
- ۱) Policies and Procedures:
 - a) Assessment of P&T Committee effectiveness/ impact on quality assurance in patient care.
 - b) Committee's enforcement of limiting usage of specific drugs.
 - c) Evaluation, planning and implementing a hospital formulary system.

VIII. Education and Training Programs:

- a) Technician training program
- .۱ Assessment, planning and implementing a technical training program based on quality assurance standards.
- b) Residence program
- .۱ Assessment, planning and implementation of an accredited residency training program in various specialities.
- c) Other education and training program
- .۱ Training/educational programs for department personnel.
 - .۲ Training/educational (in-service) programs for other health professionals .

PHCL 540 HOSPITAL PHARMACY MANAGEMENT AND ADMINISTRATION (2+0)

DESCRIPTION

The course presents contemporary management theories in current organizational use, and a comprehensive study of the essential principles of management i.e. planning, problem solving, etc. Specific important management and administrative principles and techniques in human relations development, financial analysis and control mechanisms, etc. will be focused upon.

COURSE OUTLINE

I. Introduction

- A) Overview of management principles and theory development.
- B) Management: Theory, Science, Art, and Practice.

II. Administrative Management

Essential Functions

1. Planning:

- a) Definition
- b) Setting objectives
- c) Set procedures/strategies and develop policies
- d) Premising
- e) Decision making

2. Organizing:

- a) Definition
- b) Organization structuring
- c) Establishing job specifications, description, etc.

3. Directing/Leading/Coordinating:

- a) Definition
- b) Effective delegating techniques
- c) Motivation and cooperation
- d) Managing change, stress and individual differences

4. Staffing:

- a) Definition
- b) Selection of proper personnel
- c) Orientation and training
- d) Human resource development

5. Controlling:

- a) Definition
- b) System and process of controlling
- c) Control techniques

III. Operations/Systems and Technology management

Functions and/or elements

- 1. Financing
- 2. Marketing
- 3. Patient, professional and public relations
- 4. Accounting
- 5. Productivity
- 6. Computerization
- 7. Technological systems and equipment, etc.

PHCL 570 RESEARCH PROJECT (0+3)

A. COURSE DESCRIPTION:

This course is meant to allow the student to gain experience in research utilizing the principles and knowledge learned in PHCL 520, MATH 205, as well as undergraduate courses. The student must work closely with his advisor to select an appropriate project, design it, and carry it out. Since the course has no lectures nor rigid format, the student shall meet regularly with his advisor as often as necessary so that he does not fall behind in carrying out the project.

After selecting, designing and refining an appropriate project, the student will complete it over the course of two semesters (1st and 2nd of 2nd year) receiving a grade of "incomplete" after the first semester. The final project must be presented in typewritten form, and of publishable quality .

The completed project must be presented verbally to the faculty and defended. The course grade will be based on the quality of the scientific findings, quality of the final project, and on the oral presentation and defense.

B. COURSE OBJECTIVES

After completion of the course the student will be able to do the following:

1. Identify a problem, new idea, or a new approach or method.
2. Design a project to solve the problem or prove the method.
3. Carry out the project to finality:
 - a) Refine the project as necessary
 - b) Utilize current as well as secondary literature
 - c) Develop or utilize proper methodology
 - d) Collect data
 - e) Analyze data
 - f) Present findings:
 - i) In proper written format
 - ii) In proper oral format
 - g) Define findings of the project and
 - h) Recognize limitations of the project and necessary additional research.
4. Work independently, and with others:
 - a) Pace self to finish a project within necessary time \square \square limit.
 - b) Recognize and utilize others assistance and criticism.

C. COURSE FORMAT:

The student must utilize his time efficiently, working independently and with his advisor. He shall meet with his advisor as often as necessary, but at least twice per week .

The student must select a project based on his future career goals, ability and time restraints; and secure his advisers' approval. He must submit a well-written, typed research protocol approved by his advisor to the department council for approval. This must be completed by the end of the first semester of the second year at the latest .

The protocol should precisely define a specific area of interest such as a problem to be solved, a new idea, or a new approach or method. The project should include the evaluation of data; but even if the data collected is from published literature, it must follow scientific research design and format including the following :

Introduction, methodology, findings, discussion ,
significance, and future research needs

The student may take the first and second semesters of the second year to complete the course, but regularly scheduled deadlines must be established by him and his advisor, and the deadlines must be met. The purpose of the established deadlines are to insure the continuous progress of the project and prevent the student's falling behind

PHCL 590: Seminar (0+1)

A research project must be selected by the student in consultation with his advisor; and should be selected based on the student's future career goals, ability, and time restraints. The student must submit a well-written, typed research protocol to the department council for approval. This should be done during the second semester of the first year.

The protocol should precisely define a specific area of interest such as a problem to be solved, a new idea, or a new approach or method. The project should include the education of data; but even if the data collected is from published literature, it must follow scientific research design including the following. Introduction, methodology, findings, discussion, significance, and future research needs.

The student may take the first and second semesters of the second year to complete the project, in which case he will receive an "incomplete" for a grade at the end of the first semester. The final project must be presented in typewritten form, and of publishable quality.

The course grade will be determined based on the quality of the scientific findings, quality of the finding project and on the oral presentation and defines of the project findings to the faculty.

PHCL 591 CP CLERKSHIP WITH CARDIOLOGY (0+1)

Although syllabi are not applicable for experiential courses such as the clerkships, the following is an example of what will be taught in a clerkship

This cardiology clerkship will emphasize cardiovascular disease conditions, their treatment and monitoring. Some diagnostic tests and procedures will be studied such as electrocardiograms, echocardiograms, cardiac catheterizations, and others: but emphasis will be directed towards understanding their usefulness, particularly in terms of their monitoring values. Utilization of current literature will also be stressed in terms of solving problems, improving drug therapy, and understanding specific drug combinations.

Students will be assigned specific patients to correlate with the disease conditions listed below. Discussion sessions will be the format for teaching rather than classroom lectures. Discussions will be held in the ward area i.e. spontaneous specific patient-oriented, as well as more formal sessions outside the ward area. All clerkship students will be included in periodic general discussion sessions, usually three times weekly. Their patients will be presented by the students who follow them, and general discussions by all students and staff will be conducted.

The topics to be covered are not new ones, and it is expected that the student have a general knowledge of the topics prior to attempting this course. We will concentrate on utilizing that baseline knowledge, adding to it, refining it, and putting the total knowledge into patient-specific practice. The following topics will be covered during this four-week clerkship course:

Diseases of the Coronary Arteries

Ischemic Heart Disease: Angina pectoris - stable, unstable, variant: total ischemic burden i.e. silent and painful angina. We will discuss ECG, echocardiograms, stress tests, thallium stress test, cardiac catheterization (right and left). We will emphasize drug therapy and discuss surgical therapy.

Myocardial Infarction: Painful and silent, q-wave and non-q-wave. Included will be treatment: angioplasty, antithrombotic therapy, anticoagulants, vasodilators, antiarrhythmics, anti-platelet agents. Treatment in the CCU, treatment on the wards, and long-term treatment will be covered.

CLERKSHIP ROTATION REQUIREMENTS

Obligatory Rotations:

1. PHCL 531 - Hosp. Pharm. I
2. PHCL 521 - Advanced Drug Information
3. PHCL 511 - TDM-I
4. PHCL 552 - Med-I
5. PHCL 560 - Med-II
6. Selective Rotation
7. Selective Rotation
7. Selective Rotation

Selective rotations may be taken from the following as they become available: (2 selectives must be taken from one area).

Areas of Emphasis:

<u>Clinical Medicine</u>	<u>Hospital Pharmacy</u>	<u>Therapeutic Drug Monitoring</u>
1. PHCL 550 - Pulmonary Med.	1. PHCL 532 - osp. Pharm.II	1. PHCL 512 - TDM II
2. PHCL 551 - Ambu. Care Med.	2. PHCL 541 - Hosp. Pharm. III	2. PHCL 513 - TDM III
3. PHCL 552 - Gastroenterology		
4. PHCL 553 - Endocrinology Med.		
5. PHCL 554 - Cardiology Med.		
6. PHCL 555 - Oncology Med.		
8. PHCL 556 - Rheumatology Med.		
9. PHCL 557- Infectious Disease		
7. PHCL 558 - Pediatric Med.		
9. PHCL 559-		

Surgery

PHCL 531 HOSPITAL PHARMACY - I (•+۳)

In this course hospital pharmacy operational techniques and principles taught in didactic courses such as PHCL 530 which is prerequisite will be applied under the direction of practicing hospital pharmacists. (Prereq. PHCL 530).

PHCL 532 HOSPITAL PHARMACY – II (•+۳)

This course is an extension of PHCL 531 (described above) where applications of techniques and principles of hospital pharmacy will be explored in greater depth. It is designed for the student who intends to practice in an area where hospital pharmacy practice will predominate. (Prereq. PHCL 531)

PHCL 541 HOSPITAL PHARMACY ADMINISTRATION (0+3)

This course will stress the application of hospital pharmacy administration principles taught in didactic courses such as PHCL 540 which is prerequisite. The preceptor will be a practicing hospital pharmacy administrator in a local hospital. (Prereq. PHCL 540)

PHCL 550 PULMONARY (0+3)

Patients with pulmonary disease conditions will be covered. The disease conditions encountered will be reviewed, current therapy will be reviewed, the patients' physical assessment will be reviewed, the patients' therapy will be assessed, the patients will be monitored, and new and/or investigational therapies will be discussed. The clerkship will be precepted by a clinical pharmacist practicing on the pulmonary service.

PHCL 551 AMBULATORY CARE (•+۳)

Patients being treated for disease conditions as outpatients (clinic patients) will be seen. Patients' disease conditions will be reviewed, current therapy, physical assessment and individual patients therapy will be reviewed. The patients improvement will be monitored and patient interviews will be conducted. Students will be precepted by clinical pharmacists practicing in the area .

PHCL 552 GASTROENTEROLOGY (•+۳)

The same description as stated under PHCL 550 applies here except patients with gastrointestinal diseases will be covered.

PHCL 553 ENDOCRINOLOG (•+۳)

The same description as stated under PHCL 550 applies here except patients with endocrine disorders will be covered.

PHCL 554 CARDIOLOGY (•+۳)

The same description as stated under PHCL 550 applies here except patients with cardiovascular disorders will be covered.

PHCL 555 ONCOLOGY (•+۳)

The same description as stated under PHCL 550 applies here except patients with malignant diseases will be covered.

PHCL 556 RHEUMATOLOGY (۳+•)

The same description as stated under PHCL 550 applies here except patients with rheumatoid conditions will be covered.

PHCL 557 Infectious Disease (0+3)

PHCL 558 PEDIATRICS (3+0)

The same description as stated under PHCL 550 applies here except pediatric patients will be covered.

PHCL 559 SURGERY (3+0)

Patients who are admitted for surgery and/or who have had surgical operations will be covered. Their underlying disease condition(s) prior to and following surgery will be monitored. Particular emphasis will be placed on antibiotic and pain medications encountered, as well as drugs used to prepare the patient for surgery to induce anesthesia and/or analgesia, to maintain anesthesia, and post surgery medication. The students will be precepted by a clinical pharmacist practicing on the surgery service.