



NEW YORK STATE EDUCATION DEPARTMENT
 Office of Higher Education—Office of College and University Evaluation
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<http://www.highered.nysed.gov/ocue/>
OCUERevAdmin@nysed.gov

Request to Change or Adapt a Registered Program

Item	Response (type in the requested information)
Institution name and address	Dominican University New York 470 Western Highway Orangeburg, NY 10962 Additional information: Specify campus where program is offered, if other than the main campus:
Identify the program you wish to change	Program title: <u>Award</u> (e.g., B.A., M.S.): B.S. Credits: 120 <u>HEGIS code</u> : 0401.00 (Biological Sciences) <u>Program code</u> : 35029
Contact person for this proposal	Name and title: Bernadette Connors, Ph.D Telephone: 845-848-6020 Fax: _____ E-mail: bernadette.connors@duny.edu
CEO (or designee) approval	Name and title: <i>Dr. Thomas S. Nowak, VP for Academic Affairs</i> Signature and date: <i>[Signature] 5/8/23</i>
<i>Signature affirms the institution's commitment to support the program as revised.</i>	If the program will be registered jointly with another institution, provide the following information: Partner institution's name: Name and title of partner institution's CEO: Signature of partner institution's CEO:

- For programs that are registered jointly with another institution, all participating institutions must confirm their support of the changes.

Check all changes that apply and provide the requested information.

Changes in Program Content (*Describe and explain all proposed changes; provide a side-by-side comparison of the existing and newly modified programs.*)

- Cumulative change from the Department's last approval of the registered program that impacts one-third or more of the minimum credits required for the award (e.g., 20 credits in an associate degree program)
- Changes in a program's focus or design
- Adding or eliminating an option or concentration
- Eliminating a requirement for program completion
- Altering the liberal arts and science content in a way that changes the degree classification, as defined in Section 3.47(c)(1-4) of Regents Rules

If new courses are being added as part of the noted change(s), provide a syllabus for each new course and list the name, qualifications, and relevant experience of faculty teaching the course(s). Syllabi should include a course description and identify course credit, objectives, topics, student outcomes, texts/resources, and the basis for determining grades.

The Science Department at Dominican University New York proposes to establish a 3+4 articulation agreement with Howard University College of Pharmacy (HUCOP) in Washington, DC. The program would require Dominican University New York (Dominican) biology majors to complete HUCOP pre-requisite courses, as well as courses required to fulfill University Gen Ed requirements, at Dominican. Once admitted to HUCOP, the students would then complete their first-year Pharm.D. courses at Howard University. Some of these credits (22 credits) would then reverse transfer back to Dominican, allowing the students to earn their B.S. in Biology at Dominican. Undergraduate students who successfully complete all 4 years at HUCOP will earn 2 degrees (B.S. and Pharm.D.) in total of 7 years.

Undergraduate students would apply to HUCOP during the Fall semester of their junior year.

HUCOP Admission Criteria

- PCAT not required, but recommended
- GPA of 2.5 (average GPA of admitted students is 3.2)
- Completion of all pre-requisite coursework
- Interview and on-site Math test

Changes in coursework:

1. A 4-credit biology or science elective is required for Biology majors. This elective will be satisfied by **Pharmaceutics (4)** at HUCOP.
2. Topics in Biology (2), which is a required course for Biology majors, will be replaced with **Professional Practice Readiness (3)**. This latter course utilizes principles of team building and case-based learning to develop student understanding of the practical aspects of contemporary pharmacy practice. Like Topics in Biology, this course will provide students with an understanding of current topics in their chosen professional field.
3. Research Seminar I (3), which is a required course for Biology majors, will be replaced with **Drug Informatics (2)**. Justification for this substitution is that the student learning objectives in Research Seminar I most closely align with this HUCOP course, in particular, the development of skills required to obtain information from various literature and reference sources, techniques for researching and evaluating drug literature, and emphasis on systemic approaches to formulation of responses utilizing both verbal and written communication skills.
4. Research Seminar II (3), which is a required course for Biology majors, will be replaced with **Pharmacy Care (3)**. Research Seminar II is a capstone course for Biology majors that allows them to complete a research project of their own design and communicate their results at the Annual Science symposium. A capstone course is not available in year 1 for HUCOP students, so there is no clear substitution that can be

made. Instead, Pharmacy Care was chosen because it teaches skills in professional communication, recognizing errors, and data collection, each of which are taught in Research Seminar II in some way.

5. Other courses (below) taken in the first year at HUCOP will serve as Dominican electives, bringing the total accumulated credits to 120. These courses were chosen because of their focus on scientific principles. In total, 8 courses at HUCOP will reverse transfer to Dominican University NY.

- Pharmaceutical Chemistry I (3)
- Pharmaceutical Chemistry II (3)
- Pharmaceutical Calculations I (2)
- Pharmaceutical Calculations II (2)

6. HUCOP requires a minimum grade of C in all pre-requisite courses. GPA requirements for Dominican students is outlined in the University catalog.

7. Dominican students who don't successfully complete year 1 courses at HUCOP will need to return to Dominican to complete their coursework in order to receive their B.S. degree. These courses include: Bioinformatics, Topics in Biology, Research Seminar I and II, and any free electives (bringing them to 120 credits in total). They will need to have a 2.5 GPA in both their major and overall, in order to graduate.

The currently proposed changes would require Dominican students to complete 98 credits distributed amongst courses in the Gen Ed curriculum, biology, and science and math cognate courses at Dominican, and 22 at HUCOP. Students would earn a B.S. in Biology at Dominican University NY upon successful completion of the required courses at both Dominican and HUCOP.

Attachments:

- I. Course map comparisons with current GEC distributions
- II. HUCOP Course Syllabi
- III. HUCOP Faculty Credentials
- IV. Draft Articulation Agreement

Date _____

Dominican University

ID# _____

Catalog year: _____

BS IN BIOLOGY (PharmD)

NAME:		Total Credits Earned:				
ADDRESS:		Degree/Date:				
CITY, STATE, ZIP		Institution Name(s):				
E-MAIL ADDRESS:		Placement Exam				
CONTACT NUMBERS		Math: _____ English: _____				
Home: _____		CORE SEQUENCE (55-56 Credits)				
Cell: _____		COURSE TITLE				
COMPONENT I (12-15 CREDITS)		COURSE				
COURSE	COURSE TITLE	GRADE	CREDITS	GRADE	CREDITS	
A. Writing Sequence (3-6 Credits)						
EN 120	College Writing and Research		3	BI 201**	Pathways to Biology I	2
EN 123	Writing about Literature		3	BI 202**	Pathways to Biology II	2
B. Speech (3 Credits)						
CS 111	Dyn. of Oral Communication	GRADE	CREDITS	BI 2215	General Biology I	4
C. Foundation Courses (3 Credits)						
MA 221	Calculus I	GRADE	CREDITS	BI 2225	General Biology II	4
Other required cognate courses						
CH 221	General Chemistry I	GRADE	CREDITS	BI 226	Genetics	4
CH 222	General Chemistry II		4	BI 227	Botanical Sciences	4
CH 331	Organic Chemistry I		4	BI 229	Molecular Microbiology	4
CH 332	Organic Chemistry II		4	BI 342 or BI 334*	Human Physiology or Histology	4
PY 221	General Physics I		4	BI 223	Anatomy and Physiology 1	4
MA 235	Biostatistics and Epidemiology		3	BI 224	Anatomy and Physiology 2	4
Free Electives						
Freshmen Seminar						
HUCOP Pharmaceutical Chemistry I						
HUCOP Pharmaceutical Chemistry II						
HUCOP Pharmaceutical Calculations I						
HUCOP Pharmaceutical Calculations II						
*If the student has chosen to take A&P I and II as their electives, they must take BI 334 Histology rather than BI 342 Human Physiology						
** Students who are not required to take these courses due to their catalog year requirements will need to take an additional 3- or 4-credit Science course						
COMPONENT II (12 Credits)		GRADE		GRADE		CREDITS
C (Classical)			3			2
M (Medieval)			3			3
P (Present)			3			3
Any additional C, M, or P course						
Is Global requirement met?						
COMPONENT III (3-6 Credits)		Minimum of 4 S, V courses				
V (Values)			3			2
General Psychology I (S)						

General Education requirements (HUCOP) (15 credits)

At least 3 credits in Humanities: Art, Drama, Theater, Literature, Mythology, Religion, Music, Foreign Languages, Philosophy

At least 6 credits in Socio-behavioral sciences: Psychology, Economics, Sociology, Political Science, History, Education, Anthropology, Government, or African American Studies

Six remaining credits may include: Statistics, Computer Fundamentals, Operating Systems, Programming, Math above Calculus I, Medical Terminology, Humanities and/or Socio-behavioral sciences

Drug Informatics- Bisrat Hailemeskel

Doctor of Pharmacy (Pharm.D)

University of Toledo, OH - Doctor of Pharmacy

1993

Analytical Chemistry

MSc.

Addis Ababa University - Master's of Science

1987

Pharmacy

B.Pharm

Addis Ababa University - Bachelor's of Pharmacy Degree

1981

Pharmaceutical Calculations I and II- Simeon Kolawole Adesina

Pharmacy

B. Pharm. (distinction)

Obafemi Awolowo University, Ile-Ife, Nigeria

2000

Pharmaceutics

M.Sc.

Obafemi Awolowo University

2005

Pharmaceutical Sciences

Ph.D.

Howard University

2010

Pharmaceutical Care-Youness R. Karodeh

Pharmacy

Doctorate of Pharmacy/Pharm. D.

Shenandoah University

2001

Bachelor of Science in Pharmacy

Bachelor

Howard University College of Pharmacy

1986

Professional Practice Readiness I-Imbi Drame

PharmD

Howard University

Pharmaceutics-Emmanuel O. Akala

Pharmacy and Pharmaceutics

B.Pharm., M.Sc.

University of Ife (Now Obafemi Awolowo University), Nigeria

1980 & 1983

Pharmaceutics

Ph.D.

University of Manchester, England

1986

Pharmaceutics and Bioengineering

NIH Postdoctoral Fellow in Pharmaceutics and Bioengineering

University of Utah, USA.

1994-1997

Pharmaceutical Chemistry I-Simon Wang

Ph. D. Computational Chemistry

University of Florida

M. S., Pharmacology

Peking Union Medical College

Pharmaceutical Chemistry II-Amol Kulkarni

Chemistry

PhD

The State University of New York at Buffalo

Pharmaceutical Sciences

B. Pharm. Sci.

University of Mumbai

Howard University
College of Pharmacy
Department: Pharmaceutical Sciences

Course Plan

Title: Pharmaceutics

Course Number: 13636-307-01

Credit Hour: Four

Sequence: Spring semester

Effective Date: 01/11/2021

Course Schedule: Monday (11:40 a.m. to 1:30 p.m.) & Wednesday (3:10 p.m. to 5 p.m.)

Course Coordinator: Emmanuel O. Akala, R.Ph., Ph.D.

Contact Information: Emmanuel O. Akala, R.Ph., Ph.D. (eakala@howard.edu; 202-806-5896 (Office); 301-257-2863 (mobile)). Offices: Virtual

Office hours: Monday (3 p.m. to 4 p.m.) and Friday (3 p.m. to 4 p.m.) or by appointment (Phone or Zoom).

Location: Virtual/Remote/Online

Email: eakala@howard.edu

Year: First Professional Year (P1)

Instructors:

Emmanuel O. Akala, R.Ph., Ph.D. (eakala@howard.edu; 202-806-5896)

Indiran Pather, D. Pharm., (indiran.pather@howard.edu; 202-806-6551)

Simeon Adesina, R.Ph., Ph.D. (simeon.adesina@howard.edu; 202-865-0401).

Oluwatoyin Adeleke, Ph.D. (oluwatoyin.adeleke@fulbrightmail.org; 301-761-7989).

Prerequisites (if any): None

Online Course Sites:

Blackboard.howard.edu or <http://blackboard.howard.edu>

Tegrity®: via Blackboard website

HU COP: <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®

Required Textbook/Reading Materials:

Lecture notes posted on the Blackboard

Recommended Textbook(s)/References (if necessary):

(1) Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems (10th Edition) Howard C. Ansel. and Loyd V. Allen jr.

(2) Theory and Practice of Contemporary Pharmaceutics, Edited by Tapash K. Gosh and Bhaskara R Jasti (CRC Press LLC, Boca Raton, FL).

(3) Martin's Physical Pharmacy and Pharmaceutical Sciences (7th Edition-Patrick J. Sinko)

(4) Remington: The Science and Practice of Pharmacy, 22nd Edition

(5) USP/NF (Current Edition will be required).

(6) Supplemental reading as assigned by the course coordinator and individual instructor.

Required Technologies/Websites:

- Blackboard: <http://blackboard.howard.edu>
- ECHO360®: Via blackboard website
- HU COP: <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®
- Zoom: You will be provided with a link for online lectures. Please ensure zoom software is downloaded, up to date, and functional on your computer in advance.
- ExamMaster®: <https://howard.myexammaster.com/>
- ExamID/ExamMonitor – When necessary, exams will be monitored via ExamID and ExamMonitoring software from Examsoft. ExamID is the exam integrity and student authentication software that can prevent exam-taker impersonation and create a secure and streamlined check-in process. ExamMonitor provides the remote proctoring services to ensure exam integrity and prevent academic dishonesty. You must download the latest version of Exemplify 2.3.4 prior to start of the module
 - Hardware requirements:
 - Webcam
 - Microphone (no headphones!)
 - 2 GB free HDD space
 - 4 GB RAM required; 8 GB recommended
 - 2 Mbps upload speed
 - CPU equivalent to Intel i3 2+ GHz

- MAC OS (10.13, 10.14, 10.15)
- Windows 10 (Version 1809 or 1903 only)

Course Delivery:

The College of Pharmacy has adopted the HyFlex model for our courses. However, due to the resurgence of COVID-19 in the District of Columbia and other states, this course currently will be delivered fully via online using ECHO 360 live streaming. Adjunct faculty may use zoom for their lectures. Students will not be allowed to come to College for face to face classroom learning at this time. All assignments, quizzes and exams will be online via ExamSoft. Remote proctoring will be via Exam Monitor in ExamSoft.

Course Description:

Pharmaceutics is multidisciplinary. It is a branch of pharmaceutical sciences that deals with the optimization of drug therapy through (i) the investigations of physicochemical properties of drug molecules and materials of drug formulations (excipients) that ensure successful development of pharmaceutical dosage forms; (ii) design, fabrication/preparation and evaluation of dosage forms (drug products or drug delivery systems): science of drug formulation and manufacture of dosage forms; (iii) biopharmaceutics: the study of factors that affect bioavailability of a drug in humans and animals and the use of this information to optimize pharmacological and therapeutic activity of drug products; (iv) pharmacokinetics: it deals with the kinetics of absorption, distribution, metabolism and excretion (ADME) of drugs and their corresponding pharmacologic, therapeutic or toxic responses in humans and animals.

Though the four areas mentioned above can be described as pharmaceutics, given drug information explosion and the extensive amount of information being presented to the Doctor of Pharmacy students to prepare them for subsequent pharmacy practice, biopharmaceutics and pharmacokinetics are offered as separate courses in most Colleges of Pharmacy including Howard University. Physico-chemical principles of pharmacy and design, fabrication/preparation and evaluation of dosage forms (drug products or drug delivery systems): science of drug formulation and manufacture of dosage forms) may be taught sequentially in one course for each type of pharmaceutical dosage forms or in parallel. In the College of Pharmacy at Howard University, we teach Physico-chemical principles of pharmacy as a separate course in parallel with Pharmaceutics (the design, fabrication and evaluation of dosage forms (drug products or drug delivery systems): science of drug formulation and manufacture of dosage forms) in the same semester. In pharmaceutics we emphasize formulation, preparation, stability, packaging, and regulatory requirements of different types of dosage forms for varied and diverse routes of administration.

Course Objectives:

At the end of the course, the student shall have developed an understanding of:

- (a). Formulation and preparation of solid dosage forms (tablets, capsules, and powders)
- (b). Formulation and preparation of solutions, emulsions, suspensions, ointments and creams.
- (c). Modified or controlled release dosage forms.
- (d). Developments in nanotechnology for drug delivery
- (e). Dosage forms for different routes of administration (ophthalmic, nasal, buccal and sublingual, topical and transdermal, rectal and vaginal, and injectable).
- (f). Stability and packaging of various drug products
- (g). Drug regulatory processes, current good manufacturing practices and quality control of various drug products.

HUCOP Curricular Outcomes and Learning Objectives

The Howard University College of Pharmacy is committed to assuring that its Doctor of Pharmacy graduates achieve competence in the ability-based outcome areas set forth by the Accreditation Council of Pharmacy Education (ACPE) and the Center for the Advancement of Pharmaceutical Education (CAPE) Educational Outcomes. These learning outcomes provide an organizing structure around which to frame discussions of curriculum design, restructuring, implementation, and assessment. In addition, a well- designed curriculum built around these ability-based outcomes helps to ensure the student's transitional growth across the curriculum resulting in professional competency and the ability to provide excellent patient care upon entry into practice.

This document identifies fifteen program-level ability-based outcomes and their related learning objectives. Proficiency in these fifteen outcomes will ensure general educational competency as well as professional competency in the core domains of Foundational Knowledge, Essentials for Practice and Care, Approach to Practice and Care, and Personal and Professional Development.

FOUNDATIONAL KNOWLEDGE

Outcome 1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., pharmaceutical, social/behavioral /administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient centered care.

Learning Objectives

- 1.1.1. Analyze mechanisms of disease and related mechanisms of actions of drugs for treatment
- 1.1.2. Develop an understanding of **population-specific** health needs
- 1.1.3. Apply knowledge of biomedical sciences to address **patient-related** therapeutic problems.

- 1.1.4. Integrate knowledge of **pharmaceutical, social/behavioral/ administrative, and clinical sciences** to solve therapeutic problems.
- 1.1.5. Demonstrate comprehension of major scientific discoveries and use of the scientific method to make these discoveries.
- 1.1.6. Perform error-free mathematical calculations with regard to drug dosing, pharmacokinetics, and compounding dosage forms

Outcome 2.2. Medication use systems management (Manager) - Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.

Learning Objectives

- 2.2.1. Participate in the management of formulary, purchasing and inventory control systems.
- 2.2.2. Operate and manage medication use systems, policies, procedures and records in accordance with state and federal legal regulations, institutional policies, ethical, social, economic and professional guidelines.
- 2.2.3. Participate in the development, implementation, and/or evaluation of practices that assure safe, accurate and time-sensitive medication distribution.
- 2.2.4. Participate in the development, implementation, and/or evaluation of systems to identify and report medication errors and adverse drug events.
- 2.2.5. Apply quality assurance measures and continuous process improvement in the medication use process.
- 2.2.6. Address patient needs during transition of care.
- 2.2.7. Demonstrate proficient use of technology utilization in the medication use system.
- 2.2.8. Access relevant print or electronic information and data
- 2.2.10. Interpret and evaluate the suitability, accuracy, and reliability of information from the primary literature (scientific, clinical, pharmacoeconomic and epidemiologic studies).
- 2.2.11. Obtain, appraise and apply information from secondary drug and health resources
- 2.2.12. Define and apply terminology related to health care informatics
- 2.2.15. Assess and manage the use of electronic technologies to access and manage scientific/clinical information and data; document and manage patient care and practice management records; support interpersonal and/or professional communication; support education of patients, families, self and professional associates; and support safe and effective drug distribution
- 2.2.16. Manage information, informatics, and other technologies in accordance with state and federal legal regulations; institutional policies; and ethical, social, economic, and professional guidelines.

APPROACH TO PRACTICE AND CARE

Outcome 3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and

evaluate a viable solution.

Learning Objectives

3.1.1. Demonstrate reasoned and reflective consideration of evidence in a particular context to make a judgment

3.1.2. Apply critical thinking skills, including identification, investigation, application, analysis, creativity, synthesis and evaluation, to clinical or other professional problem-solving and decision making.

Instructional Methodology/Activities:

This course is team-taught. Each Professor has the freedom of choosing instructional methodology and giving assignment as deem appropriate. (1). The principle of “reinforcing concept by studying experts: an integrated approach to the teaching of pharmaceuticals” (Emmanuel O. Akala et. al “Reinforcing Concepts by Studying Experts: An Integrated Approach to the Teaching of Pharmaceuticals”, Journal of Pharmacy Teaching 11(2);13-33 (2004)) is used by assigning research articles to students to read, evaluate and bring out the various concepts used by the authors in the formulation and preparation of pharmaceutical dosage forms (comparison with the concepts taught in the class). (2). Expository writing: learn-to-write and write-to-learn (students will further integrate information when they engage in more complex thought processes involved in writing essays). Students will be asked to write an essay (two to three pages) at the end of each major topic.

Policies on Examinations, Grades, Class Attendance, and Dress Code

1. The College/University policies concerning student Conduct and Cheating during examinations described in the **COP Student Handbook/Manual** and the Howard University By-Laws on Student Code of Conduct and Judiciaries described in the **H-Book** shall apply to this course. In addition, **only** nonprogrammable calculators shall be allowed in the exams. A student who violates this policy will receive a grade of “zero” in that exam.
2. All scheduled exams shall be based on materials covered since the last exam as described in the Lectures/Exams Schedule and shall be announced before each examination. The final examination shall be comprehensive, i.e., it shall cover all the materials of the course.
3. The exam schedule appears in the Lectures/Exams Schedule as outlined. However, the class, through its President, may request changing any or all of the scheduled examinations because of conflict with other courses **only within the first ten (10) working days** of the semester. The Course Coordinator shall attempt to accommodate this request while taking into account the need to include in each examination a reasonable amount of course material. After distributing the final revision, no change in the examination schedule shall be permitted except under unforeseen circumstances determined by the Course Coordinator.

4. Students have the responsibility to take all scheduled examinations on the announced date and time. To insure fairness in the conduct of examinations, no tardy student shall be allowed into the examination room after any other student has left the room. A student who reports to the examination hall late shall not be given any extra time.
5. A student who fails to appear and take the exam on its scheduled date and time, shall earn the grade of "zero" unless his/her absence is considered "excused."
6. Students may review and compare their answers with the exam key during the specific times announced by the instructor and requests for grade changes will be considered only during this time. This will be announced during class.

Although calling the Instructor or the Course Coordinator on or before the exam is desirable, it does not constitute a permission to miss the exam

Evaluation Procedures and Policies on Examinations Grading System

The D. Kirkpatrick's four levels of evaluation will be adapted for this course.

- (i). Evaluation of the reaction of students to the teaching methods as well as contents of the course so as to nip early problems in the bud.
 - (ii). Performance evaluation: Formative evaluation to see whether or not students are learning and terminal evaluation to determine their level of competence.
 - (iii). Transfer/application evaluation: To evaluate if the students are able to use the knowledge acquired in this course in other aspects of the Doctor of Pharmacy Program.
 - (iv). Impact evaluation: This is an assessment of the long-term impact of the products (graduates) of this course and other courses in the Doctor of Pharmacy curriculum on the society and professions in which pharmacists interact.
- *Only the first two levels of D. Kirkpatrick's four levels of evaluation will be considered this semester.

(i) Questionnaire will be distributed to students in the middle of the course to see their reactions to the course and the teaching methods. The purpose of this is to use the feedback for adjustment, if necessary.

(ii)The final grade computation for the course will be based on the following:

1. Four semester examinations* @ 18 % each: 72 %
2. Final comprehensive examination** 15 %
3. Group reading, analysis, and presentation 5 %
4. Group and individual assignments 5%
5. Class attendance*** 3%

*All examinations including the comprehensive examination count toward the final grade

*Examinations during the semester shall be based on materials covered during a specified period and are not comprehensive to date of the examination.

** The final examination will be comprehensive and based on all lecture materials covered throughout the semester. All students must take all (five) examinations.

***Any student absent from two lectures will receive 2% for class attendance.

***Any student absent from three lectures will receive 1% for class attendance.

***Any student absent from four or more lectures will receive 0% for class attendance.

Homework Assignments:

Students will be given homework assignments to stimulate their critical thinking and improve their problem solving ability. For example, the students could be asked to develop a formulation leading to a dosage form, determine the amount of each ingredient required per dosage schedule and to comment on the purpose of the ingredients in the formulation. Students will study research articles in Pharmaceutical Sciences to help them understand topics covered in the lectures. Group analysis and presentations will be given as announced during the semester.

The numerical equivalents of letter grades are as follows:

90 - 100%	= A
86 - 89%	= B+
80 - 85%	= B
76 - 79%	= C+
70 - 75%	= C
Below 70%	= F

Professional Conduct During Lectures

There shall be no eating, drinking, smoking or disruptive behavior during the lecture periods.

American Disability Act Statement

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the Office of the Dean for Special Student Services for verification and determination of reasonable accommodations as soon as possible after admission to the University, or at the

beginning of each semester. The Dean of Special Student Services, Dr. Barbara Williams, can be reached at (202) 238-2420.

Policy Regarding Excused Absences in Examinations:

Procedures for absences in an examination for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP Excused Absence Policy for the semester.

Class Attendance:

1. No non-registered student is authorized or permitted to continue in any course offered by the Department of Pharmaceutical Sciences beyond the final day for registration. No exceptions will be made.
2. A non-registered student will be interpreted by the instructor of the course as a student whose name does not appear on the official class list provided by the Registrar's Office after the final day of registration.
3. All students registered for a course are expected to show up for class **ON TIME** and to attend all classes. Students missing class for any reason are responsible for the material missed.

Dress Code

The college policy concerning Dress Code as described in the College of Pharmacy Student Handbook/Manual shall apply to this course

Non-registered Students

A non-registered student is not authorized or permitted to continue in the course past the final day for registration. No exceptions are permitted. No one will be allowed to remain in the class or participate in any class activity. If you have registered for the course and paid your fees but your name is not on the class roll, you may show the instructor an official University paid receipt for the course to remain temporarily in class while you follow University procedure to be placed on the University Official class roster as quickly as possible. Registration printout is not acceptable.

Class Attendance Restricted to Registered Students

Only students whose names appear on the official course roster are permitted to attend class meetings. Students who are not registered are not permitted to attend or participate in course activities, do not have access to Blackboard, cannot submit course assignments, and will not receive a grade for this course. It is the students' responsibility to ensure that they are properly registered by the published registration deadline. Requests to add courses after the deadline will not be considered.

Online Course Site: Blackboard.howard.edu

This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates and announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.

“Writing Matters” – Writing Across The Curriculum (WAC)

“Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course, I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatically sound, and consistent with the conventions of the field. If your writing does not meet these standards, I may deduct points or ask you to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.”

Policy regarding course withdrawal

Course withdrawal date has been posted at the University and College calendar. Please follow the deadline. (The deadline for course withdrawal for IT courses are five business days prior to the scheduled final exam posted at the beginning of the course)

Exam Software Policy

Examsoft® software will be used for all examinations. Make sure your laptop computer is fully working and charged. Exam should be downloaded prior to the exam as specified by the instructor. The exams can be composed of multiple choice, fill-in and/or short answer/essay.

Exam Review Policy

Each student shall receive the copy of their grade sheets generated by ExamSoft™ along with the correct answers. A time will be announced to the class by the course coordinator for this purpose. An overall performance of the class will be provided by the course coordinator. Duplication of an exam questions via writing or electronic means will be considered an act of academic dishonesty.

Or

For exams taken remotely, the grades will be released via Examsoft and/or Blackboard once the exam monitor feedback is received. Students may schedule

a one-on-one review of the examinations with the coordinator during the office hours or by appointment via zoom. There will be no examination review for the final examination. Students may be directed to instructors who taught specific sections of the course if the exam cannot be satisfactorily reviewed by the course coordinator. Duplication of exam questions via writing, electronic or other means will be considered an act of academic dishonesty..

Exam Questions

Question/concern about specific exam questions must be addressed to the course coordinator. If the topic is not taught by the course coordinator, the instructor will be contacted. It is the coordinator's decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

Cheating in the Examinations:

All examinations shall be proctored by ExamMonitor software to prevent and discourage cheating. If cheating is determined, Examsoft will send a video footage of the cheating, will be verified by the course instructors and will be handled in accordance with procedures set forth in the Howard University Academic Code of Conduct. Students should read the "Academic Code of Conduct" that is published in the H-Book and the Student Reference Manual and Directory of Classes. The "Academic Code of Conduct" is available at www.provost.howard.edu

Policy regarding Remediation:

Remediation procedure for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP remediation policy for the semester.

Course Evaluation:

Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

Pharmaceutics Lecture Schedule – Spring 2021

<u>Week No.</u>	<u>Lecture No.</u>	<u>Date</u>	<u>Lecture Title</u>	<u>Faculty</u>
1.	1.	11 January	Introduction & General Considerations in Dosage Form Design	Dr. Akala
	2.		Introduction & General Considerations in Dosage Form Design	Dr. Akala
	3.	13 January	Packaging	Dr. Pather
	4.		Packaging	Dr. Pather
2.		18 January	Martin Luther King Jr. Holiday – University Closed	
		20 January	Presidential Inauguration	No lecture

3.	5	25 January	Good Manufacturing Practices	Dr. Akala
	6		Good Manufacturing Practices	Dr. Akala
First Essay				Dr. Akala
	7.	27 January	Dosage Form Stability	Dr. Pather
	8.		Dosage Form Stability	Dr. Pather
4.	9.	1 February	Dosage Form Stability	Dr. Pather
	10.		Drug Regulatory Process	Dr. Pather
	11.	3 February	Drug Regulatory Process	Dr. Pather
	12.		Drug Regulatory Process	Dr. Pather
Second Essay				Dr. Pather
5	13.	8 February	Solid Dosage Forms: Powders	Dr. Akala
	14.		Solid Dosage Forms: Powders	Dr. Akala
	15.	10 February	Solid Dosage Forms: Tablets	Dr. Akala
	16.		Solid Dosage Forms: Tablets	Dr. Akala
6		15 February	President's Day	No Lecture
	17.	17 February	Solid Dosage Forms: Capsules	Dr. Akala
	18.		Solid Dosage Forms: Capsules	Dr. Akala
		17 February	1:30 pm - 3:00 pm Pharmaceutics Exam 1	
7	19.	22 February	Quality Control of Solid Dosage Forms	Dr. Akala
	20.		Quality Control of Solid Dosage Forms	Dr. Akala
	21.	24 February	Pharmaceutical Solutions	Dr. Adesina
	22.		Pharmaceutical Solutions	Dr. Adesina
8	23.	1 March	Two Phase Liquid Dosage Forms (Emulsion)	Dr. Akala
	24.		Two Phase Liquid Dosage Forms (Emulsion)	Dr. Akala
	25.	3 March	Two Phase Liquid Dosage Forms (Suspension)	Dr. Adeleke
	26.		Two Phase Liquid Dosage Forms (Suspension)	Dr. Adeleke
		3 march	1:30 pm - 3:00 pm Pharmaceutics Exam 2	
Third Essay				Dr. Akala
9. March 6 – 13 Spring Break				
10.	27.	15 March	Modified Release Oral Dosage Forms	Dr. Adesina
	28.		Modified Release Oral Dosage Forms	Dr. Adesina
	29.	17 March	Modified Release Oral Dosage Forms	Dr. Adesina

	30.		Modified Release Oral Dosage Forms	Dr. Adesina
11.	31.	22. March	Ophthalmic Drug Delivery	Dr. Adeleke
	32.		Ophthalmic Drug Delivery	Dr. Adeleke
	33.	24 March	Nasal Drug Delivery	Dr. Pather
	34.		Nasal Drug Delivery	Dr. Pather
		24 march	1:30 pm - 3:00 pm Pharmaceutics Exam 3	
12.	35.	29 March	Buccal and Sublingual Drug Delivery	Dr. Pather
	36.		Buccal and Sublingual Drug Delivery	Dr. Pather
	37.	31 March	Pulmonary Delivery	Dr. Adesina
	38.		Pulmonary Delivery	Dr. Adesina
Fourth Essay				Dr. Adesina
13.	39.	5 April	Topical and Transdermal Delivery	Dr. Akala
	40.		Topical and Transdermal Delivery	Dr. Akala
	41.	7 April	Topical and Transdermal Delivery	Dr. Akala
	42.		Topical and Transdermal Delivery	Dr. Akala
		7 April	8:00 am - 9:30 am Pharmaceutics Exam 3	
14.	43.	12 April	Rectal and Vaginal Delivery	Dr. Pather
	44.		Rectal and Vaginal Delivery	Dr. Pather
	45.	14 April	Rectal and Vaginal Delivery	Dr. Pather
	46.		Injectable Formulations	Dr. Adesina
15	47.	19 April	Injectable Formulations	Dr. Adesina
	48.		Injectable Formulations	Dr. Adesina
Fifth Essay				Dr. Adeleke
.	49.	21 April	Nanotechnology	Dr. Akala
	50.		Nanotechnology	Dr. Akala

GROUP READING, ANALYSIS AND PRESENTATION

PHARMACEUTICS GROUP ASSIGNMENT: 2021

GROUP 1	GROUP 2
<p><u>Abass, Michael</u></p> <p><u>Amini, Sara</u></p> <p><u>Ayuk-Arrey, Tambe</u></p> <p><u>Badger, Olanza K.</u></p> <p><u>Bell, Essence D.</u></p> <p><u>Biru, Belen F.</u></p> <p><u>Brown, Ewana V.</u></p> <p><u>Campbell, Chaya S.</u></p>	<p><u>Chapman, Celeste N.</u></p> <p><u>Cook, Christina E.</u></p> <p><u>Cornish, Marissa E.</u></p> <p><u>Felton, Bryce M.</u></p> <p><u>Frimpong, Victoria</u></p> <p><u>Gakpara, Michel K.</u></p> <p><u>Gebresenbet, Teras M.</u></p> <p><u>Harris, Kabri E.</u></p>
GROUP 3	GROUP 4
<p><u>Hossin, Amira S.</u></p> <p><u>Iheme, Krystal</u></p> <p><u>Kalu, Kelechi o.</u></p> <p><u>King, Emmanuel A.</u></p> <p><u>Marshall, Makayla D.</u></p> <p><u>McCaskle, Annika</u></p> <p><u>McIntosh, Ayanna E.</u></p> <p><u>Mejia, Gianna A.</u></p>	<p><u>Miller, Brittney S.</u></p> <p><u>Miller, Camerra C.</u></p> <p><u>Montague, T'yanna</u></p> <p><u>Mpacko, Suzanne Annie S.</u></p> <p><u>Nimoh, Oliver K.</u></p> <p><u>Nwokochah, Chioma M.</u></p> <p><u>Nworji, Abrena</u></p> <p><u>Ojo, Christina O.</u></p> <p><u>Ward, Raney J.</u></p>

GROUP 5

Oppong, Nathaniel

Oputa, Nneka D.

Saeidi Rizi, Saba

Sinclair, Daria M.

Sun, Keran

Thomas, Szarria Q.

Townsend, Taliyah M.

Wagner, Secret L.

Washington, Jaeyesen S.

Research paper #1: Drug release from tableted wet granulations comprising cellulosic (HPMC or HPC) and hydrophobic component. S. Kiortsis et. al. European Journal of Pharmaceutics and Biopharmaceutics 59; 78-83(2005)

Research paper #2: Tamper Evident Pharmaceutical Packaging – Needs and Advances. Manoj Shivaji Kumbhar, Naresh Hiraram Choudhary, Deepak Annasaheb Dighe, Meera Chandradatt Singh Sinhgad. International Journal of Pharmaceutical Sciences Review and Research. Volume 13, Issue 2, March – April 2012 Pages 141-153

Research paper #3: Formulation development and evaluation of gabapentin controlled release tablets. Dembla NM, Maniyam AP, Agarwal S. Pharm Pharmacol Int J. 2015;2(3):75–81.

Research Paper #4: Silke Klick, Pim G. Muijselaar, Joop Waterval, Thomas Eichinger, Christian Korn, Thijs K. Gerding, Alexander J. Debets, Cari Sanger-van de Griend, Cas van den Beld, Govert W. Somsen, and Gerhardus J. De Jong

Toward a Generic Approach for Stress Testing of Drug Substances and Drug Products Pharmaceutical Technology FEBRUARY 2005

Research Paper #5: Emmanuel O. Akala

Oral Controlled Release Solid Dosage Forms, in Theory and Practice of Contemporary Pharmaceutics Chapter 11 Pages 334-365 (2005)

Research Paper #6: Emmanuel O. Akala and Simeon K. Adesina

Fabrication of polymeric core-shell nanostructures in Nanoscale Fabrication, Optimization, Scale-up and Biological Aspects of Pharmaceutical Nanotechnology Edited by Alexandru Mihai Grumezescu (2018)

Howard University
Department of Clinical and Administrative Pharmacy Sciences

Title

Professional Practice Readiness I
CRN: 88577-319

Credit Hours:

3 credit hours

Sequence

Fall 2020/1st Professional Year

Effective Date

August 24, 2020

Course Coordinator

Imbi Drame, PharmD

Office: Annex III Room 216

Phone: 202-806-6875

Email: imbi.drame@howard.edu

Office Hours: Mondays 1pm-3pm EST OR by appointment. Virtual office visits outside of office hours will be scheduled via **Appointy**. Office hours will be held via Blackboard Collaborate

BB Collaborate Virtual Office Hours Information:

Link: <https://us.bbcollab.com/guest/cf2638dfa289439ba0baca9c42e68095>

Dial-In: +1-571-392-7650

PIN: 155 762 9034

Location/Time

Online- Blackboard Collaborate may be used at coordinator's discretion

Tuesdays: 10am-12:50pm

Online Course Site: Blackboard.howard.edu

Instructors:

Anthony K. Wutoh, PhD, RPh

Provost and Chief Academic Officer, Howard University

Oluwaranti Akiyode, PharmD, BCPS, CDCES

Assistant Dean of Student Affairs, Howard University College of Pharmacy

Souzan Hawala-Druy, MPH, BSN

Director of Interdisciplinary Healthcare Ethics, Howard University College of Medicine

Yolanda McKoy-Beach, PharmD

Assistant Professor, Howard University College of Pharmacy

Imbi Drame, PharmD

Assistant Professor, Howard University College of Pharmacy

Prerequisite/Corequisite

None

Required and Suggested Texts:

Required Text for this course:

- Sigler's Prescription Top 300 Drug Cards, 36th edition (Pocket Guide 2020)

Suggested References for this course:

- Krinsky DL, Ferreri SP, Hemstreet B. Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care. *Amer Pharm Assoc.* 2017 November, 19th edition.
- Berger B. Communication Skills for Pharmacists: Building Relationships, Improving Care. *Amer Pharm Assoc.* 2009, 3rd edition.

Required Technologies/Websites:

- Blackboard: <http://blackboard.howard.edu>
- ECHO 360: via Blackboard website
- HU COP: <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®

Required Equipment/Supplies

- Sphygmomanometer with stethoscope kit- MDF Calibra Aneroid Black MDFF808M-11 (or choice brand)
- Alcohol Swabs

Course Delivery

The College of Pharmacy has adopted the HyFlex model for our courses. However, due to the resurgence of COVID-19 in the District of Columbia and other states, this course currently will be delivered fully via online using Blackboard Collaborate live streaming. Adjunct faculty may use zoom for their lectures. Students will not be allowed to come to College for face to face classroom learning at this time. All assignments, quizzes and exams will also be online via ExamMonitor.

Classroom

Students who opt to attend lecture in person must occupy only the seats that have been assigned to them. Students are required to wipe down seating area (desk, chair, etc.) before and after each use. Students must wear masks or face coverings. The instructor will be the last to leave the classroom and will wipe down his/her desk and any equipment. The instructor will also wipe down doorknob when exiting. Students who need special accommodations that need to be taken into account, as the instructor is creating the seating chart, must contact the instructor before classes begin.

Course Description

This course utilizes principles of team-building and case-based learning to develop student understanding of the practical aspects of contemporary pharmacy practice. Instructors will introduce students to the Pharmacist's Patient Care Process (PPCP)¹, covering the first three steps in the five-step process. Course learning objectives will be based upon competencies outlined in the Entrustable Professional Activities endorsed by the American Association of Colleges of Pharmacy. Emphasis will be placed on both the verbal and written communication skills needed to interact with a diverse set of patients and across health care disciplines. Heavy focus will be placed on developing knowledge of, and

devising patient-centered goals related to, the Top 150 prescription drugs for 2020. In addition, students will learn patient-counseling techniques, and develop basic physical assessment and clinical documentation skills.

HUCOP Curricular Outcomes and Learning Objectives

Curricular Outcomes:

DOMAIN 1: FOUNDATIONAL KNOWLEDGE

Outcome 1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., *pharmaceutical, social/behavioral/administrative, and clinical sciences*) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and *patient-centered care*.

Learning Objectives

1.1.2. Develop an understanding of *population-specific* health needs

DOMAIN 2: ESSENTIALS FOR PRACTICE AND CARE

Outcome 2.1. Patient-centered care (Caregiver) - Provide *patient-centered care* as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

Learning Objectives

2.1.5. Document pharmaceutical care activities in the patient's medical record to facilitate communication and collaboration among providers.

DOMAIN 3: APPROACH TO PRACTICE AND CARE

Outcome 3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Learning Objectives

3.1.2. Apply critical thinking skills, including identification, investigation, application, analysis, creativity, synthesis and evaluation, to clinical or other professional problem-solving and decision making.

Outcome 3.2. Educator (Educator) – Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding.

Learning Objectives

3.2.1. Educate the public and professional associates regarding health and wellness; treatment and prevention of diseases and medical conditions; and use of medications, medical devices, natural products and nutritional supplements.

Outcome 3.3. Patient Advocacy (Advocate) - Assure that patients' best interests are represented.

Learning Objectives

3.3.1. Provide patients and their families with reliable information regarding their choices of treatment options
3.3.2. Recognize the impact of effective patient advocacy on patient safety.

Outcome 3.4. Interprofessional collaboration (Collaborator) – Actively participate and engage as a healthcare team member by demonstrating mutual respect, understanding, and values to meet patient care needs.

Learning Objectives

3.4.2. Communicate and collaborate with patients, other health providers, professional colleagues, and administrative and supportive personnel to engender a team approach to resource management.

Outcome 3.6. Communication (Communicator) – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.

Learning Objectives

3.6.1. Interview patients using an organized structure, specific questioning techniques (e.g., motivational interviewing), and medical terminology adapted for the audience.

3.6.2. Gather, organize, and summarize information effectively in written, verbal, and multi-media format.

3.6.3. Gather, summarize, and organize information from lay, technical, scientific and clinical publications and patient records

3.6.4. Document pharmaceutical care activities in the patient's medical record to facilitate communication and collaboration among providers.

DOMAIN 4: PERSONAL AND PROFESSIONAL DEVELOPMENT

Outcome 4.1. Self-awareness (Self-aware) – Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth.

Learning Objectives

4.1.5. Strive for accuracy and precision by displaying a willingness to recognize, correct, and learn from errors.

4.1.6. Display positive self-esteem and confidence when working with others.

Course Learning Objectives (EPAs):

In order to achieve the abovementioned learning outcomes, this course will cover the following learning objectives based upon the Entrustable Professional Activities for New Pharmacy Graduates (EPAs)³:

LO1: Collect information to identify a patient's medication-related problems and health-related needs.

- Collect *medical* history from a patient or caregiver
- Collect *medication* history from a patient or caregiver

LO2: Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.

- Measure an adult patient's vital signs and interpret the results
- Assess a patient's health literacy using a validated screening tool
- Compile a prioritized health-related problem list for a patient
- Evaluate an existing drug therapy regimen

LO3: Establish patient-centered goals and create a care plan in collaboration with the patient, caregiver(s), and other health professionals that is evidence-based and cost-effective.

- Develop a treatment plan with a patient
- Select monitoring parameters to determine the therapeutic and adverse events related to the treatment plan
- Create a patient-specific education plan

LO4: Collaborate as a member of an interprofessional team

- Explain to the patient, caregiver, or professional colleague each team member's role and responsibilities
- Use consensus-building strategies to develop a shared plan of action

LO5: Educate patients and professional colleagues regarding the appropriate use of medications.

- Develop and deliver a brief (less than 1 hour) educational program regarding medication therapy to health professionals or lay audience. *See **Appendix A** for complete curricular map and checklist.

Pharmacist's Patient Care Process¹

The following aspects of the PPCP will be covered during this course:

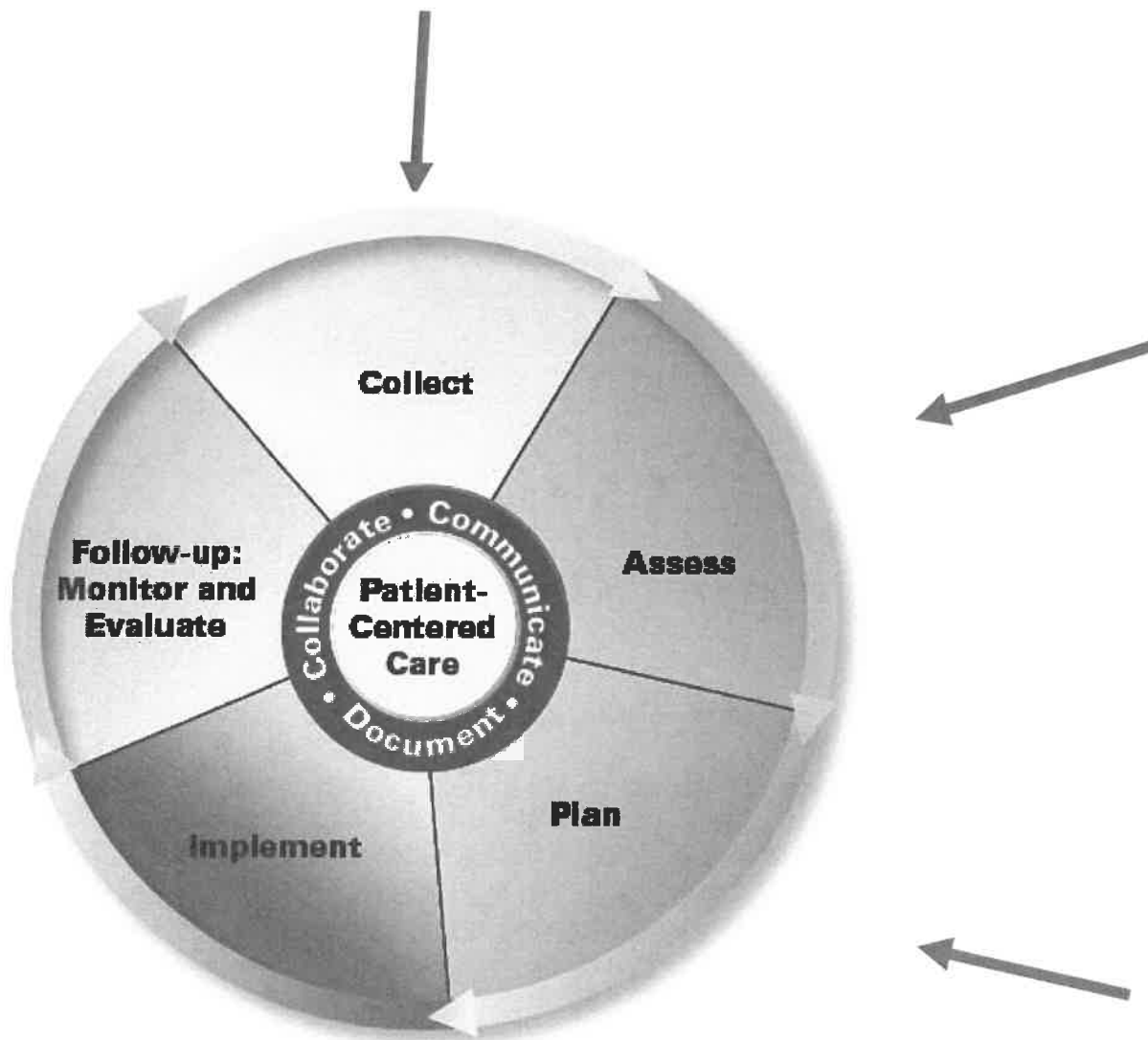


Figure 1: Pharmacists' patient care process

Instruction/Methodology/Activities:

The teaching modalities utilized within this course facilitate hands-on application of concepts and skills for pharmacy practice. In addition to lectures, other in-class and co-curricular activities that drive student learning and understanding of communication principles and contemporary pharmacy issues will be employed. Team exercises, online activities, and a mini-OSCE will comprise the active learning modalities. As a co-curricular activity, students will be expected to complete one interprofessional encounter.

In-Class Exercises

A series of in-class exercises will be used to enhance understanding of concepts and skills taught during the didactic lecture. Students will have an opportunity to work in teams for certain exercises, but in some cases, will work in pairs or

individually. Exercises will be completed during class time (unless otherwise determined by the lecturer or course coordinator).

Case-based Practicums

Learning the Top 150 drugs can be an overwhelming task for most 1st-year pharmacy students, especially for those with limited or no exposure to a pharmacy setting. Online tools will be provided to learners to facilitate learning of the top 150 drugs, which will be covered and assessed in this course. Individually, students will be assessed on their knowledge and understanding of the Top 150 drug cards during 10 class sessions. A case-based practicum that covers 10-20 of the drugs will be administered as an individual timed assessment during each of the 9 sessions. Once the individual assessment is concluded, teams will have an opportunity to take the same assessment collaboratively. Teams that earn a score above 85% will receive an additional 5% on each team member's assessment.

Interprofessional Activity

Students will complete the online interprofessional activity during the Fall semester. The activity will be completed online using an interactive program that exposes the learner to the four competencies of interprofessional education as defined by the Interprofessional Education Consortium (IPEC). These competencies include: 1) Values and Ethics, 2) Roles and Responsibilities, 3) Teamwork, and 4) Interprofessional Communication. The IPE activity must be completed by *Monday, November 2, 2020*

Criteria

The activity will involve completing all 4 online modules prepared by the CUNY IPE Lab (IPE eLearning Resources): <https://ipelab.commons.gc.cuny.edu/ipe-elearning-resources/>. Once completed, students must download for each module: 1) A Certificate of Completion, and 2) A Response Form. All 8 documents must be merged into a single pdf file and uploaded under the specified Assignment tab in Blackboard. For full credit, students must also complete the online IPKAS Survey following the lecture on November 3, 2020.

Policies on Examinations, Grades, Class Attendance, and Dress Code

1. The College/University policies concerning student Conduct and Cheating during examinations described in the **COP Student Handbook/Manual** and the Howard University By-Laws on Student Code of Conduct and Judiciaries described in the **H-Book** shall apply to this course. In addition, **only** nonprogrammable calculators shall be allowed in the exams. A student who violates this policy will receive a grade of "zero" on that exam.
2. All scheduled exams shall be based on materials covered since the last exam as described in the Lectures/Exams Schedule and shall be announced before each examination. The final examination shall be comprehensive, i.e., it shall cover all the material of the course.
3. The exam schedule appears in the Lectures/Exams Schedule as outlined. However, the class, through its President, may request changing any or all of the scheduled examinations because of conflict with other courses **only within the first ten (10) working days** of the semester. The Course Coordinator shall attempt to accommodate this request while taking into account the need to include in each examination a reasonable amount of course material. After distributing the final revision, no change in the examination schedule shall be permitted except under unforeseen circumstances determined by the Course Coordinator.
4. Students have the responsibility to take all scheduled examinations on the announced date and time. To ensure fairness in the conduct of examinations, no tardy student shall be allowed into the examination room after any other student has left the room. A student who reports to the examination hall late shall not be given any extra time.
5. A student who fails to appear and take the exam on its scheduled date and time, shall earn the grade of "zero" unless his/her absence is considered "excused."

6. Students may review and compare their answers with the exam key during the specific times announced by the instructor and requests for grade changes will be considered only during this time. This will be announced during class.

Although calling the Instructor or the Course Coordinator on or before the exam is desirable, it does not constitute a permission to miss the exam

Policy Regarding Excused Absences in Examinations:

Procedures for absences in an examination for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP Excused Absence Policy for the semester.

Grades:

Assessment

Team presentation	:	15 points (total)
*Peer Assessment	(5 points)	
Instructor Evaluation	(5 points)	
†Self-Assessment	(5 points)	
Case-based practicums		30 points (3.33 points each)
SOAP Note		10 points
Mini-OSCE		10 points
IPE Encounter		5 points
Class Attendance/Exercises		10 points
Final Exam		20 points (comprehensive)

Total **100 points**

Numerical equivalents of letter grades shall be as follows:

90-100% = A

86-89% = B+

80-85% = B

76-79% = C+

70-75% = C

69% and below = F

Class Attendance:

1. No non-registered student is authorized or permitted to continue in any course offered by the Department of Clinical and Administrative Pharmacy Sciences beyond the final day for registration. No exceptions will be made.
2. A non-registered student will be interpreted by the instructor of the course as a student whose name does not appear on the official class list provided by the Registrar's Office after the final day of registration.
3. All students registered for a course are expected to show for class **ON TIME** and to attend all classes. Students missing class for any reason are responsible for the material missed.

Dress Code

The college policy concerning Dress Code as described in the SOP Student Handbook/Manual shall apply to this course

Non-registered Students

A non-registered student is not authorized or permitted to continue in the course past the final day for registration. No exceptions are permitted. No one will be allowed to remain in the class or participate in any class activity. If you have registered for the course and paid your fees but your name is not on the class roll, you may show the instructor an official University paid receipt for the course to remain temporarily in class while you follow University procedure to be placed on the University Official class roster as quickly as possible. Registration printout is not acceptable.

Class Attendance Restricted to Registered Students

Only students whose names appear on the official course roster are permitted to attend class meetings. Students who are not registered are not permitted to attend or participate in course activities, do not have access to Blackboard, cannot submit course assignments, and will not receive a grade for this course. It is the students' responsibility to ensure that they are properly registered by the published registration deadline. Requests to add courses after the deadline will not be considered.

American Disability Act Statement

The HyFlex model accommodates students by giving them the option of attending face to face or online classes. Students who usually receive ADA accommodations should continue to contact the Office of Student Services to make those arrangements.

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the office of the Dean for Special Services for verification and determination of reasonable accommodations as soon as possible after admission to the University, or at the beginning of each semester. The Dean of Special Services, Dr. Elaine Heath, can be reached at (202) 238-2420.

Online Course Site: Blackboard.howard.edu

This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.

“Writing Matters” – Writing Across The Curriculum (WAC)

“Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatical, and consistent with the conventions of the field. If your writing does not meet these standards, I may deduct points or ask you to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.”

Policy regarding course withdrawal

Course withdrawal date has been posted on the University and College calendar. Please follow the deadline.

Exam Software Policy:

Examsoft® software will be used for all examinations. Ensure that your laptop computer is fully working and charged. The exam should be downloaded prior to the examination period, and as specified by the instructor. The exams can be composed of multiple choice, fill-in and/or short answer/essay.

Exam Review Policy:

Each student shall receive the copy of their grade sheets generated by ExamSoft™ along with the correct answers. A time will be announced to the class by the course coordinator for this purpose. An overall performance of the class will be provided by the course coordinator. Duplication of an exam questions via writing or electronic means will be considered an act of academic dishonesty.

Exam Questions:

Questions about specific exam questions must be addressed with the course coordinator. If the topic was not taught by the course coordinator, the instructor will be contacted. It is the coordinator's decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

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Policy regarding Remediation:

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Course Evaluation:

Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

Missed Course Work/Assignment Policy

Students will be eligible to makeup any missed assignments, quizzes, or exams at the discretion of the Course Coordinator. The makeup assignment or assessment will also be devised based upon the Course Coordinator's discretion. An excused absence will serve as the only acceptable reason for missed work. The burden of proof lies with the student, who must arrange a missed session with the Course Coordinator ahead of time (if the circumstance is foreseen) or provide proof of an unforeseen absence within 72 hours of returning to class. If the unforeseen circumstance is of a personal matter wherein proof cannot be provided to the Course Coordinator, then the Course Coordinator will verify with the Office of the Dean and/or Office of Student Affairs.

Course Schedule**Dates/Times: Tuesdays- 10:00am-12:50pm EST**

Date	Topic/Activity	Assessment/DUE DATES	Presenter
Week 1: August 25	<ul style="list-style-type: none"> • Orientation to PPR I • Effective Communication & Care Models 	IPKAS Survey 1 (Blackboard)	Drame
Week 2: September 1	<ul style="list-style-type: none"> • Patient Counseling 		Drame
Week 3: September 8	<ul style="list-style-type: none"> • Teambuilding/Receiving and Giving Feedback 		Akiyode
Week 4: September 15	<ul style="list-style-type: none"> • Conflict Resolution/ Motivational Interviewing 	Case-based Practicum #1 (Teams 1 and 2 Drugs)- Brand, generic, and common indications ONLY	Akiyode
Week 5: September 22	<ul style="list-style-type: none"> • Pharmacists Patient Care Process/SOAP Note Writing I 	Case-based Practicum #2 (Team 3 Drugs)	TBD/ Drame
Week 6: September 29	<ul style="list-style-type: none"> • History-taking, & Physical Assessment 	Case-based Practicum #3 (Team 4 Drugs)	Drame
Week 7: October 6	<ul style="list-style-type: none"> • SOAP Note Writing II 	Case-based Practicum #4 (Team 5 Drugs)	TBD
Week 8: October 13	<ul style="list-style-type: none"> • Case Presentations 	Case-based Practicum #5 (Team 6 Drugs)	Drame
Week 9: October 20	<ul style="list-style-type: none"> • Medication Therapy Management (MTM) 	Case-based Practicum #6 (Team 7 Drugs)	McKoy-Beach
Week 10: October 27	<ul style="list-style-type: none"> • History of Pharmacy 	Case-based Practicum #7 (Team 8 Drugs) IPE Activity DUE (November 2 at 11:59pm EST)	Wutoh
Week 11: November 3	<ul style="list-style-type: none"> • Working Across Professions/Patient-Centered Care/Cultural Competency 	Case-based Practicum #8 (Team 9 Drugs) IPKAS Survey 2 DUE (Blackboard) (November 3 at 11:59pm EST)	Hawala-Druy
Week 12: November 10	<ul style="list-style-type: none"> • Defining and Assessing Health Literacy 	Case-based Practicum #9 (Team 10 Drugs)	Drame

Week 13: November 17	Team Presentations	Faculty
Week 14: November 24	Mini-OSCE (Online)	Faculty

Works Cited: 1. Joint Commission of Pharmacy Practitioners. *Pharmacist's Patient Care Process*. 29 May 2014, 2. Pittenger AL, Copeland DA, and Lacroix MM et al. AACP Report of the 2016-17 Academic Affairs Standing Committee: Entrustable Professional Activities Implementation Roadmap. *American Journal of Pharmaceutical Education* 2017;81(5) Article S4

Appendix A

EPA	EPA-related Objectives (Please check box next to objective achieved):	Overall Learning Outcomes (Please check box next to outcome/competency):
LO1: Collect information to identify a patient's medication-related problems and health-related needs.	<input type="checkbox"/> Collect <i>medical</i> history from a patient or caregiver <input type="checkbox"/> Collect <i>medication</i> history from a patient or caregiver	<input type="checkbox"/> CO3: Demonstrate ability to complete a basic physical assessment
LO2: Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.	<input type="checkbox"/> Measure an adult patient's vital signs and interpret the results <input type="checkbox"/> Assess a patient's health literacy using a validated screening tool <input type="checkbox"/> Compile a prioritized health-related problem list for a patient <input type="checkbox"/> Evaluate an existing drug therapy regimen	<input type="checkbox"/> CO4: Formulate a clear and concise SOAP note based upon knowledge of the Top 150 Drugs and basic treatment guideline information <input type="checkbox"/> CO5: Discuss key steps in the Medication Therapy Management process
LO3: Establish patient-centered goals and create a care plan in collaboration with the patient, caregiver(s), and other health professionals that is evidence-based and cost-effective.	<input type="checkbox"/> Develop a treatment plan with a patient <input type="checkbox"/> Select monitoring parameters to determine the therapeutic and adverse events related to the treatment plan <input type="checkbox"/> Create a patient-specific education plan	<input type="checkbox"/> CO1: Display satisfactory communication skills for both patients and health care professions through oral presentation, interdisciplinary interaction, and team building activities <input type="checkbox"/> CO4: Formulate a clear and concise SOAP note based upon knowledge of the Top 150 Drugs and basic treatment guideline information <input type="checkbox"/> CO5: Discuss key steps in the Medication Therapy Management process

<p>LO4: Collaborate as a member of an interprofessional team</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Explain to the patient, caregiver, or professional colleague each team member's role and responsibilities <input type="checkbox"/> Use consensus-building strategies to develop a shared plan of action 	<p>CO1: Display satisfactory communication skills for both patients and health care professions through oral presentation, interdisciplinary interaction, and team building activities</p> <ul style="list-style-type: none"> <input type="checkbox"/> CO2: Convey appropriate and professional behaviors while serving patients and working with colleagues, including conflict resolution and customer service skills
<p>LO5: Educate patients and professional colleagues regarding the appropriate use of medications.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Develop and deliver a brief (less than 1 hour) educational program regarding medication therapy to health professionals or lay audience 	<p>CO1: Display satisfactory communication skills for both patients and health care professions through oral presentation, interdisciplinary interaction, and team building activities</p>

HOWARD UNIVERSITY - COLLEGE OF PHARMACY
Department: Clinical & Administrative Pharmacy Services

DRUG INFORMATICS - COURSE PLAN

TITLE:	DRUG INFORMATICS
Credit Hour:	2 hours
Sequence:	Fall Semester
Class meets on	<u>Tuesdays 8:00 pm – 9:50 am Virtually</u>
Effective Date:	7/31/2020
Course Coordinator:	Bisrat Hailemeskel, B.Pharm., MSc, Pharm.D., RPh., Professor & Vice Chair
Contact Information:	Tel: 202-806-4214; bhailemeskel@howard.edu
Office hours:	Tuesdays 2-3:30 pm or anytime by appointment
Location:	Virtual
Year:	1st Year Pharmacy Students
Instructors:	HU Faculty & Guest lecturers
Prerequisites (if any)	None
Online Course Site:	www.blackboard.howard.edu
Required Technologies/Websites:	<ul style="list-style-type: none">- Blackboard: http://blackboard.howard.edu- Echo360®: via Blackboard website- HU COP: http://www.pharmacy.howard.edu for AccessPharmacy®, ExamSoft®

Course Description: Drug Informatics refers to the application of technology in the delivery of drug information services. Drug information services, in turn, include responding to drug information inquiries, conducting medication use evaluations and participating in medication quality assurance programs, such as; monitoring adverse drug reactions, drug and herbal product interactions, and medication errors. This course is intended to introduce students to drug information skills required to deliver pharmaceutical care. Students will be trained to develop the skills to obtain information from various literature and reference sources to answer drug information questions efficiently. Techniques for researching and evaluating drug literature will be covered. Emphasis will be placed on systemic approaches to formulation of responses utilizing both verbal and written communication skills.

Course Delivery: The College of Pharmacy has adopted the HyFlex model for our courses. However, due to the resurgence of COVID-19 in the District of Columbia and other states, this course currently will be delivered fully via online using ECHO 360 live streaming. Adjunct faculty may use zoom for their lectures. Students will not be allowed to come to College for face to face classroom learning at this time. All assignments, quizzes and exams will also be online via ExamMonitor.

Course Delivery for a resurgence of COVID-19: The course will immediately transition to fully online delivery in case a resurgence of COVID-19 occurs as determined by Howard University. All lectures will be delivered by ECHO 360/zoom/Microsoft Team. All assignments, quizzes and exams will continue to be online via ExamMonitor.

Classroom: Students who opt to attend lecture in person must occupy only the seats that have been assigned to them. Students are required to wipe down seating area (desk, chair, etc.) before and after each use. Students must wear masks or face coverings. The instructor will be the last to leave the classroom and will wipe down his/her desk and any equipment. The instructor will also wipe down doorknob when exiting. Students who need special accommodations that need to be taken into account, as the instructor is creating the seating chart, must contact the instructor before classes begin.

Course Objectives: HUCOP Curricular Outcomes and Learning Objectives

DOMAIN 1: FOUNDATIONAL KNOWLEDGE

Domain 1: Collect information to identify a patient's medication-related problems and health-related needs

Domain 11: Educate patients and professional colleagues regarding the appropriate use of medications Domain 12: Use evidence-based information to advance patient care

DOMAIN 2: ESSENTIALS FOR PRACTICE AND CARE

Outcome 2.1. Patient-centered care (Caregiver) - Provide patient-centered care as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

Learning Objectives

2.1.2. Interpret and evaluate pharmaceutical data and related information needed to prevent or resolve medication-related problem

Outcome 2.2. Medication use systems management (Manager) - Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.

Learning Objectives

2.2.1. Participate in the management of formulary, purchasing and inventory control systems.

2.2.2. Operate and manage medication use systems, policies, procedures and records in accordance with state and federal legal regulations, institutional policies, ethical, social, economic and professional guidelines.

2.2.10. Interpret and evaluate the suitability, accuracy, and reliability of information from the primary literature (scientific, clinical, pharmacoeconomic and epidemiologic studies)

2.2.16. Manage information, informatics, and other technologies in accordance with state and federal legal regulations; institutional policies; and ethical, social, economic, and professional guidelines.

DOMAIN 3: APPROACH TO PRACTICE AND CARE

Outcome 3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Learning Objectives

3.1.2. Apply critical thinking skills, including identification, investigation, application, analysis, creativity, synthesis and evaluation, to clinical or other professional problem-solving and decision making.

Outcome 3.3. Patient Advocacy (Advocate) - Assure that patients' best interests are represented.

Learning Objectives

3.3.1. Provide patients and their families with reliable information regarding their choices of treatment options

Outcome 3.6. Communication (Communicator) – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.

Learning Objectives

3.6.1. Interview patients using an organized structure, specific questioning techniques (e.g., motivational interviewing), and medical terminology adapted for the audience.

3.6.3. Gather, summarize, and organize information from lay, technical, scientific and clinical publications and patient records

DOMAIN 4: PERSONAL AND PROFESSIONAL DEVELOPMENT

Outcome 4.2. Leadership (Leader) - Demonstrate responsibility for creating and achieving shared goals, regardless of position.

Learning Objectives

4.2.1. Work effectively with others as a member or leader of an inter-disciplinary health care team or other professional group

Instructional Methodology/Activities: This course consists primarily of lectures and discussions that focus on the presentation of topics and concepts pertinent to pharmaceutical, medical and toxicological information. In addition, there will be sessions devoted to demonstrations and special assignments. Active learning will be the center of the teaching method for this course. The problems and the assignments are vehicles for the development of clinical problem-solving skills and believed to stimulate self-directed learning. Students will be asked to form groups at the beginning of the semester which will be used throughout the semester. There will be 3-5 students per group.

The course syllabus that describes the roles that students are expected to perform within a group and the course work that will be discussed in class will be posted on the Blackboard. Each class assignment will be graded and the score for the group will be the score for an individual student in the group.

Each 2 hours lecture will have three sessions. The first one-third class time will be devoted to a traditional lecture format to be delivered by the instructor, the next one-third class time will be devoted to problem-based students' group discussion, in-class assignments, PBL projects, and students' group discussion, and the remaining one-third class time will be devoted to student's presentation of their findings.

Pharmacist's Patient Care Process

Domain 1: Patient Provider

Domain 4: Information Mater (10 & 11)

Instructional Methodologies and Assessment

Policies on Examinations, Grades, Class Attendance, and Dress Code

1. The College/University policies concerning student Conduct and Cheating during examinations described in the **COP Student Handbook/Manual** and the Howard University By-Laws on Student Code of Conduct and Judiciaries described in the **H-Book** shall apply to this course. In addition, **only** nonprogrammable calculators shall be allowed in the exams. A student who violates this policy will receive a grade of "zero" on that exam.
2. All scheduled exams shall be based on materials covered since the last exam as described in the Lectures/Exams Schedule and shall be announced before each examination. The final examination shall be comprehensive, i.e., it shall cover all the material of the course.
3. The exam schedule appears in the Lectures/Exams Schedule as outlined. However, the class, through its President, may request changing any or all of the scheduled examinations because of conflict with other courses **only within the first ten (10) working days** of the semester. The Course Coordinator shall attempt to accommodate this request while taking into account the need to include in each examination a reasonable amount of course material. After distributing the final revision, no change in the examination schedule shall be permitted except under unforeseen circumstances determined by the Course Coordinator.



Figure 1: Pharmacist's patient care process



4. Students have the responsibility to take all scheduled examinations on the announced date and time. To insure fairness in the conduct of examinations, no tardy student shall be allowed into the examination room after any other student has left the room. A student who reports to the examination hall late shall not be given any extra time.
5. A student who fails to appear and take the exam on its scheduled date and time, shall earn the grade of "zero" unless his/her absence is considered "excused."
6. Students may review and compare their answers with the exam key during the specific times announced by the instructor and requests for grade changes will be considered only during this time. This will be announced during class.
7. Although calling the Instructor or the Course Coordinator on or before the exam is desirable, it does not constitute a permission to miss the exam

Policy Regarding Excused Absences in Examinations: Procedures for absences in an examination for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP Excused Absence Policy for the semester.

Grades:

- Quizzes - 20%
 - Problem/Group discussion/Assignments - 20%
 - Exam I - 15%
 - Exam II - 15%
 - Final Exam - 30%.
- 100%

Numerical equivalents of letter grades shall be as follows:

- | | |
|---------------|-------------------|
| ○ 90-100% = A | 86-89% = B+ |
| ○ 80-85% = B | 76-79% = C+ |
| ○ 70-75% = C | 69% and below = F |

Class Attendance Restricted to Registered Students: Only students whose names appear on the official course roster are permitted to attend class meetings. Students who are not registered are not permitted to attend or participate in course activities, do not have access to Blackboard, cannot submit course assignments, and will not receive a grade for this course. It is the students' responsibility to ensure that they are properly registered by the published registration deadline. Requests to add courses after the deadline will not be considered.

American Disability Act Statement: The HyFlex model accommodates students by giving them the option of attending face to face or online classes. Students who usually receive ADA accommodations should continue to contact the Office of Student Services to make those arrangements.

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the office of the Dean for Special Services for verification and determination of reasonable accommodations as soon as possible after admission to the University, or at the beginning of each semester. The Dean of Special Services, Dr. Elaine Heath, can be reached at (202) 238-2420.

Online Course Site: Blackboard.howard.edu: This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.



“Writing Matters” – Writing Across The Curriculum (WAC): “Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatical, and consistent with the conventions of the field. If your writing does not meet these standards, I may deduct points or ask you to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.”

Policy regarding course withdrawal: Course withdrawal date has been posted at the University and College calendar. Please follow the deadline. (The deadline for course withdrawal for IT courses are five business days prior to the scheduled final exam posted at the beginning of the course)

Exam Software Policy: Examsoft® software will be used for all examinations. Make sure your laptop computer is fully working and charged. Exam should be downloaded prior to the exam as specified by the instructor. The exams can be composed of multiple choice, fill-in and/or short answer/essay.

Exam Review Policy: Each student shall receive the copy of their grade sheets generated by ExamSoft™ along with the correct answers. A time will be announced to the class by the course coordinator for this purpose. An overall performance of the class will be provided by the course coordinator. Duplication of an exam questions via writing or electronic means will be considered an act of academic dishonesty.

Exam Questions: Questions about specific exam questions must be addressed with the course coordinator. If the topic was not taught by the course coordinator, the instructor will be contacted. It is the coordinator’s decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

Cheating in the Examinations: All examinations shall be proctored by ExamMonitor software to prevent and discourage cheating. If cheating is determined, Examsoft will send a video footage of the cheating, will be verified by the course instructors and will be handled in accordance with procedures set forth in the Howard University Academic Code of Conduct. Students should read the “Academic Code of Conduct” that is published in the H-Book and the Student Reference Manual and Directory of Classes. The “Academic Code of Conduct” is available at www.provost.howard.edu

Policy regarding Remediation: Remediation proceedings for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP remediation policy for the semester.

Course Evaluation: Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

An absence from an examination shall be considered “excused” if it occurs because of any of the following situation: (a valid documentation must be submitted for proof)

- Hospitalization of the student due to illness or accident
- Death in the student’s immediate family (ex. Spouse, parents, guardians, siblings, children)
- Summon of the student to appear for Jury Duty or before a court
- Attendance to professional meetings
- The absentee student shall submit documents supporting the above claims (hospital admission form, death certificate, or gov’t/court subpoena) to the course coordinator. Upon satisfactory verification, the student shall be allowed to take a makeup exam. The makeup exam may be in any form (term paper, essay...), per the discretion of the course coordinator.

DRUG INFORMATICS 83602-306

FIRST YEAR - CLASS SCHEDULE – FALL (Revised on 7/01/2020)

CLASS MEETS ON TUESDAYS 8:00 AM – 9:50 AM - Room: CCH-207

Virtual Tutorial/Consultation – TUESDAYS (1-2 PM OR any day by appointment)

AUGUST		
25	<ul style="list-style-type: none"> INTRODUCTION TO DRUG INFORMATION SERVICES CORE DRUG INFORMATION RESOURCES 	Prof. Hailemeskel
SEPTEMBER		
1	<ul style="list-style-type: none"> INTRODUCTION TO LIBRARY SERVICES 	Juan-Pablo Gonzalez
8	<ul style="list-style-type: none"> SEARCH ENGINES (GOOGLE)/METASEARCH ENG. RECEIVING AND CLASSIFYING DRUG INFORMATION 	Prof. Hailemeskel
15	<ul style="list-style-type: none"> PUBMED/MEDLINE & MICROMEDEX 	Prof. Hailemeskel
22	<ul style="list-style-type: none"> CLINICAL PHARMACOLOGY & SYSTEMATIC SEARCH 	Prof. Hailemeskel
23	<ul style="list-style-type: none"> EXAMINATION I (15%) - 3:00 PM – 4:30 PM 	
29	<ul style="list-style-type: none"> DRUG INFORMATION CONSULT & INTRODUCTION TO RESEARCH PROPOSAL WRITING I 	Dr. Hailemeskel
OCTOBER		
6	<ul style="list-style-type: none"> FORMULARY MANAGEMENT & MONOGRAPH WRITING P&T AND DRUG USE EVALUATION 	Prof. Hailemeskel Dr. Noumedem
13	<ul style="list-style-type: none"> STATISTICAL DATA INTERPRETING & STUDY DESIGN & METHODS 	Dr. Maneno
20	<ul style="list-style-type: none"> INVESTIGATIONAL DRUGS/RESOURCES RESEARCH PROPOSAL WRITING II 	Prof. Hailemeskel
27	<ul style="list-style-type: none"> CONSUMER EDUCATION ETHICAL ISSUES IN DRUG INFORMATION 	Dr. Wingate Dr. F Lombardo
28	<ul style="list-style-type: none"> EXAMINATION II 15% (3:00 pm – 4:30 pm) 	
NOVEMBER		
3	<ul style="list-style-type: none"> COMMON TYPES OF QUESTIONS FROM PROVIDERS ENCOUNTERED DURING PATIENT CARE ROUNDS & RESOURCES 	Dr. Singh
10	<ul style="list-style-type: none"> VETERANS DAY – UNIVERSITY CLOSED 	
17	<ul style="list-style-type: none"> DRUG INTERACTION & ADVERSE DRUG REACTION REPORT WRITING 	Prof. Hailemeskel
26 – 29	<ul style="list-style-type: none"> THANKSGIVING RECESS 	
DECEMBER		
TBD	<ul style="list-style-type: none"> FINAL EXAM (30%) 	

Note: This schedule is subject to change due to availability of lecturers and sites for visitation. Please refer to the schedules provided for group assignments and visitations which occur as an extension of- the regular class periods.

Howard University College of Pharmacy

Clinical & Administrative Pharmacy Sciences

Title: Pharmaceutical Care

Course Number: 13640-311

Credit Hour: 3

Sequence: Spring of 1st Professional Year

Effective Date: January 11, 2021

Course Coordinator: Dr. Youness R. Karodeh, Pharm.D., RPh.

Office: Chauncey Cooper Hall, Room #110

Phone: 202-806-9076

Email: ykarodeh@howard.edu

Virtual Office Hours until further notice:

Tue & Thr. 10-11 AM/EST or by Appointment

<https://howard.zoom.us/j/98473248970>

Passcode: 21032383

Instructors: Dr. Youness R. Karodeh, Pharm.D., RPh & Ms. Leslie Lombardo (I.V. lab)

Prerequisites (if any): None

Online Course Site: <http://blackboard.howard.edu>

Required Textbook: Prescription Drug Cards, 36th Edition, and A practical Guide to Pharmaceutical Care, 2nd Edition, John P. Rovers & Jay D. Currie, and Frequently Prescribed Medications, Michael A. Mancano. Jason C. Gallagher

Required Readings: Chapter 5: Sterile Compounding and Chapter 19: IV Drug Compatibility, Stability, Administration, & Degradation (posted on Blackboard)

Recommended Textbook(s)/References: Rx Prep. Medication Errors, 2nd edition/APhA, Drug Information Handbook, Current Edition, Lacy, Armstrong, Goldman, Lance

Required Technologies/Websites:

- **Blackboard:** <http://blackboard.howard.edu>
- **ECHO 360:** via Blackboard website

- **HU COP:** <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®

Course Delivery

The College of Pharmacy has adopted the HyFlex model for our courses. However, due to the resurgence of COVID-19 in the District of Columbia and other states, this course currently will be delivered fully via online using ECHO 360/Zoom live streaming. Adjunct faculty may use zoom for their lectures. Students will not be allowed to come to College for face-to-face classroom learning at this time, unless otherwise is indicated. Having said that, students will be given an option to attend an intensive week in April 2021 to participate in a face-to-face laboratory exercise(s), if they so desire. All assignments, quizzes and exams will also be online via ExamMonitor.

Course Description

Student pharmacists have a desire to provide direct patient care and to improve patient outcomes through optimizing patient medication therapy and reducing adverse events. This course utilizes principals of patient-centered approach and case-based learning to further develop, promote and augment student understanding of the practical aspects of modern pharmacy practice. This course is designed to expose the first-year professional students to practical and applied skills to further develop patient's data entry, a comprehensive process of prescription and medication orders, labeling and dispensing requirements, including controlled substances, and expiration dating, medication & dispensing errors, and effective written and verbal communication skills, in addition to proper disposal of medications. Student will be introduced to the health system and hospital pharmacy settings; use of Robotic Prescription Dispensing (RPD) and related automation and pneumatic dispensing systems. In addition, student will have opportunity to get engage in a simulated community practice setting, which encompasses acquiring more advance practical knowledge on patient counselling and SOAP notes taking. Patient counselling and medication therapy management skills will be further explored and developed through hands-on practice and role-play exercises. The student will be further exposed to Pharmacist's Patient Care Process (PPCP) 1, covering the first 4 steps in the five-step process; collect, assess, plan, and implement. Additional emphasis will be placed on Pharmacist Directed Care in the self-care arena, and also explore cultural competency required to interact with a variety of diverse patient populations from different cultural background and across health care disciplines. This course will utilize pharmaceutical care principles and pharmaceutical knowledge, professional techniques to further equip students with more in-depth patient-centered care and medication-related care experiences; identify actual drug related problems, resolve existing problems or prevent a drug related problem from occurring. This course will provide opportunities for students to further develop academically, personally, and professionally and build upon the knowledge and skills acquired through the previous semester of the didactic curriculum and introductory experiences. The Parenteral Product Preparation & Sterile Compounding (IV) admixture laboratory portion of this course will require students to learn and utilize the skills, techniques, and knowledge necessary for parenteral and sterile products preparation, including total parenteral nutrition (TPN).

Course Format

Pharm Care Course comprises three distinct but integrated sections: Lecture, Practice Lab, and Parenteral Product Preparation & Sterile Compounding (IV) Lab. Two practice lab sections meet in a large working group. The IV Lab is divided into smaller groups and meet once a week.

Course Objectives: By the conclusion of this course, students should be able to:

- 1) Perform validation of prescription orders in accordance with State and Federal Laws
- 2) Perform appropriate patient's data entry using McKesson PharmaServe Software
- 3) Create and maintain appropriate patient medications record
- 4) Demonstrate satisfactory verbal and nonverbal communication skills
- 5) Demonstrate appropriate use of "Robotic Prescription Dispensing (RPD) System
- 6) Demonstrate and perform medication error reviews (omission/commission)
- 7) Demonstrate appropriate use of "selected" durable medical equipment
- 8) Demonstrate ability and perform a basic patient counselling
- 9) Demonstrate understanding the core elements of MTM services and process
- 10) Formulate and perform a clear and concise SOAP note using case-based approach
- 11) Demonstrate and perform drug/drug and drug/food interactions using drug information skills and online resources
- 12) Demonstrate and utilize the skills, techniques, and knowledge necessary for parenteral products preparation, including total parenteral nutrition (TPN).
- 13) Demonstrate appropriate use of "selected" medical devices and drug delivery systems

HUCOP Curricular Outcomes and Learning Objectives

DOMAIN 1: FOUNDATIONAL KNOWLEDGE

Outcome 1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., pharmaceutical, social/behavioral/administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient-centered care.

Learning Objectives:

- 1.1.3. Apply knowledge of biomedical sciences to address *patient-related* therapeutic problems.

DOMAIN 2: ESSENTIALS FOR PRACTICE AND CARE

Outcome 2.1. Patient-centered care (Caregiver) - Provide patient-centered care as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

Learning Objectives

- 2.1.5. Document pharmaceutical care activities in the patient's medical record to facilitate communication and collaboration among providers.

Outcome 2.2. Medication use systems management (Manager) - Manage patient healthcare needs using human, financial, technological, and physical resources to optimize the safety and efficacy of medication use systems.

Learning Objectives:

2.2.7. Demonstrate proficient use of technology utilization in the medication use system.

2.2.8. Access relevant print or electronic information and data

2.2.12. Define and apply terminology related to health care informatics

Outcome 2.3. Health and wellness (Promoter) - Design prevention, intervention, and educational strategies for individuals and communities to manage chronic disease and improve health and wellness.

Learning Objectives:

2.3.1. Access, analyze and apply relevant educational strategies, quality assurance and research processes with consideration of health disparities issues.

DOMAIN 3: APPROACH TO PRACTICE AND CARE

Outcome 3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Learning Objectives:

3.1.1. Demonstrate reasoned and reflective consideration of evidence in a particular context to make a judgment

Outcome 3.2. Educator (Educator) – Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding.

Learning Objectives:

3.2.1. Educate the public and professional associates regarding health and wellness; treatment and prevention of diseases and medical conditions; and use of medications, medical devices, natural products and nutritional supplements.

Outcome 3.5. Cultural sensitivity (Includer) - Recognize social determinants of health to diminish disparities and inequities in access to quality care.

Learning Objectives:

3.5.5. Integrate cultural, sociological, behavioral, economic and environmental aspects of patient care into professional practice.

Outcome 3.6. Communication (Communicator) – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.

Learning Objectives:

3.6.2. Gather, organize, and summarize information effectively in written, verbal, and multi-media format.

3.6.3. Gather, summarize, and organize information from lay, technical, scientific, and clinical publications and patient records

DOMAIN 4: PERSONAL AND PROFESSIONAL DEVELOPMENT

Outcome 4.1. Self-awareness (Self-aware) – Examine and reflect on personal knowledge, skills, abilities, beliefs, biases, motivation, and emotions that could enhance or limit personal and professional growth.

Learning Objectives:

- 4.1.3. Demonstrate professional competence, critical thinking, and self-directed learning skills
- 4.1.5. Strive for accuracy and precision by displaying a willingness to recognize, correct, and learn from errors.
- 4.1.6. Display positive self-esteem and confidence when working with others.

Outcome 4.4. Professionalism (Professional) - Exhibit behaviors and values that are consistent with the trust given to the profession by patients, other healthcare providers, and society.

Learning Objectives:

- 4.4.3. Demonstrate appropriate professional and ethical judgment in the provision of pharmaceutical care services.

Course Learning Objectives (EPAs):

In order to achieve the abovementioned learning outcomes, this course will cover the following learning objectives based upon the Entrustable Professional Activities for New Pharmacy Graduates (EPAs)³:

EPA Domains & Core Statements		Pharmacist Patient Care Process
EPA Domain	EPA Core Statement	5 step PPCP Process (select 1 or more) Collect, Assess, Plan, Implement, Follow-Up: Monitor & Evaluate
1-Patient Provider	1- Collect information to identify a patient’s medication-related problems and health-related needs.	Collect
	2- Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.	Assess
	3- Establish patient-centered goals and create a care plan for a patient in collaboration with the patient, caregiver(s), and other health professionals that is evidence-based and cost-effective.	Plan
	4- Implement a care plan in collaboration with the patient, caregivers, and other health professionals.	Implement

4-Information Master	11-	Educate patients and professional colleagues regarding the appropriate use of medications.	Assess, Implement, Follow-Up: Monitor & Evaluate
	12-	Use evidence-based information to advance patient care.	Collect, Assess, Plan, Implement, Follow-Up: Monitor & Evaluate
5-Practice Manager	13-	Oversee the pharmacy operations for an assigned work shift.	Assess, Plan, Follow-Up: Monitor & Evaluate
	14-	Fulfill a medication order.	Implement

LO1: Collect information to identify a patient's medication-related problems and health-related needs.

- Collect medical history from a patient or caregiver
- Collect medication history from a patient or caregiver

LO2: Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.

- Assess a patient's health literacy using a validated screening tool
- Compile a prioritized health-related problem list for a patient
- Evaluate an existing drug therapy regimen

LO3: Establish patient-centered goals and create a care plan in collaboration with the patient, caregiver(s), and other health professionals that is evidence-based and cost-effective.

- Develop a treatment plan with a patient
- Select monitoring parameters to determine the therapeutic and adverse events related to the treatment plan
- Create a patient-specific education plan

LO4: Collaborate as a member of an interprofessional team

- Explain to the patient, caregiver, or professional colleague each team member's role and responsibilities
- Use consensus-building strategies to develop a shared plan of action

LO5: Educate patients regarding the appropriate use of medications.

- Develop a brief educational program regarding medication therapy to health patient or caregiver.

Instruction/Methodology/Activities:

The teaching modalities utilized within this course facilitate hands-on application of concepts and skills for pharmacy students. In addition to lectures including practice lab and Intravenous lab, activities that augment student learning.

In-Labs Exercises

A series of in-labs exercises will be used to enhance understanding of concepts and skills taught during the didactic lecture. Students will have an opportunity to work in teams for certain exercises, but in some cases, will work in pairs or individually. Exercises will be completed during class time (unless otherwise determined by the lecturer or course coordinator).

Quiz-based learning:

Learning the Top 100 drugs can be an overwhelming task for most 1st-year pharmacy students, especially for those with limited or no exposure to a pharmacy setting. Students are required to have a copy of the Sigler's Drug Cards current Edition. Learning strategy includes Brand/Generic names, Therapeutic Class, Indication, and Side Effects. Total of 5 quizzes that covers 20 of the drug cards will be administered during the lecture time throughout the semester.

Class Participation:

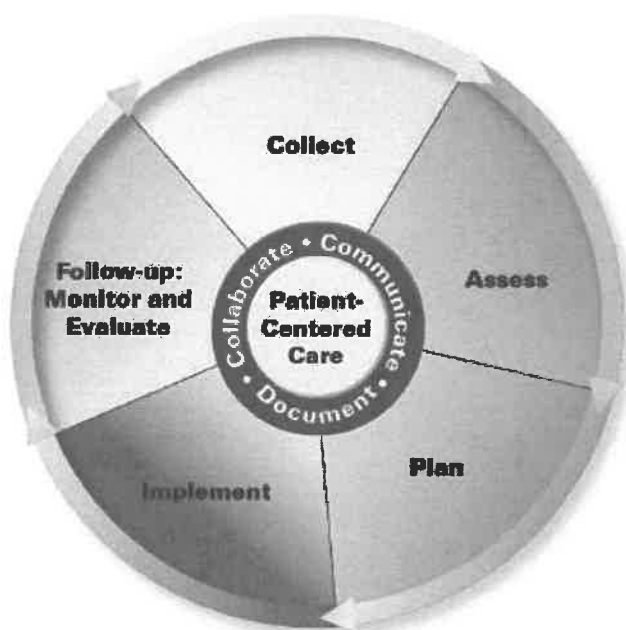
Students are required (mandatory) regular and punctual attendance of in all scheduled classes and labs at all times. Students missing class/lab for any reason are responsible for the material missed. Instructor may take random attendance and use it as assessment points as benchmarks for attendance and participation. A student, who fails to appear in person for any laboratory practice sessions and finish on its scheduled date and time, shall be allowed (course coordinator's discretion) to repeat the missed session but earn the grade of "zero," unless his/her absence is considered "Excused." Procedures for absences for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP Excused Absence Policy for the semester.

Assessments: On time attendance and participation in the weekly laboratory exercises (10%), I.V. lab attendance & participation (10%), Omission/Commission exam (10%), five mini-quizzes given, including but not limited to Pharmacy Drug Cards (20%), Mid-term examination (20%), and the final comprehensive examination (30%), Total of 100%

Pharmacist's Patient Care Process

The following aspects of the PPCP will be covered during this course: Collect, Access, Plan, Implement

Pharmacists' Patient Care Process



Pharmacists' Patient Care Process

Pharmacists use a patient-centered approach in collaboration with other providers on the health care team to optimize patient health and medication outcomes.

Using principles of evidence-based practice, pharmacists:

Collect

The pharmacist assures the collection of the necessary subjective and objective information about the patient in order to understand the relevant medical/medication history and clinical status of the patient.

Assess

The pharmacist assesses the information collected and analyzes the clinical effects of the patient's therapy in the context of the patient's overall health goals in order to identify and prioritize problems and achieve optimal care.

Plan

The pharmacist develops an individualized patient-centered care plan, in collaboration with other health care professionals and the patient or caregiver that is evidence-based and cost-effective.

Implement

The pharmacist implements the care plan in collaboration with other health care professionals and the patient or caregiver.

Follow-up: Monitor and Evaluate

The pharmacist monitors and evaluates the effectiveness of the care plan and modifies the plan in collaboration with other health care professionals and the patient or caregiver as needed.

Policies on Examinations, Grades, Class Attendance, and Dress Code

1. The College/University policies concerning student Conduct and Cheating during examinations described in the **COP Student Handbook/Manual** and the Howard University By-Laws on Student Code of Conduct and Judicaries described in the **H-Book** shall apply to this course. In addition, **only** nonprogrammable calculators shall be allowed in the exams. A student who violates this policy will receive a grade of "zero" on that exam.
2. All scheduled exams shall be based on materials covered since the last exam as described in the Lectures/Exams Schedule and shall be announced before each examination. The final examination shall be comprehensive, i.e., it shall cover all the material of the course.
3. The exam schedule appears in the Lectures/Exams Schedule as outlined. However, the class, through its President, may request changing any or all of the scheduled examinations because of conflict with other courses **only within the first ten (10) working days** of the semester. The Course Coordinator shall attempt to accommodate this request while considering the need to include in each examination a reasonable amount of course material. After distributing the final revision, no change in the examination schedule shall be permitted except under unforeseen circumstances determined by the Course Coordinator.

4. Students have the responsibility to take all scheduled examinations on the announced date and time. To ensure fairness in the conduct of examinations, no tardy student shall be allowed into the examination room after any other student has left the room. A student who reports to the examination hall late shall not be given any extra time.
5. A student who fails to appear and take the exam on its scheduled date and time, shall earn the grade of "zero" unless his/her absence is considered "excused."
6. Students may review and compare their answers with the exam key during the specific times announced by the instructor and requests for grade changes will be considered only during this time. This will be announced during class.

Although calling the Instructor or the Course Coordinator on or before the exam is desirable, it does not constitute a permission to miss the exam

Policy Regarding Excused Absences in Examinations:

Procedures for absences in an examination for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP Excused Absence Policy for the semester.

Weighting of Final Course Grade/Point Distribution:

On time attendance and participation in the weekly laboratory exercises (10%), I.V. lab attendance & participation (10%), Omission/Commission exam (10%), five mini quizzes given, including but not limited to Pharmacy Drug Cards (20%), Mid-term examination (20%), and the final comprehensive examination (30%), **Total of 100%**

Grades:

Numerical equivalents of letter grades shall be as follows:

90-100% = A

86-89% = B+

80-85% = B

76-79% = C+

70-75% = C

69% and below = F

Class Attendance:

1. **No non-registered** student is authorized or permitted to continue in any course offered by the Department of Clinical & Administrative Pharmacy Sciences beyond the final day for registration. No exceptions will be made.
2. A non-registered student will be interpreted by the instructor of the course as a student whose name does not appear on the official class list provided by the Registrar's Office after the final day of registration.
3. All students registered for a course are expected to show up for class **ON TIME** and to attend all classes. Students missing class for any reason are responsible for the material missed.

Dress Code:

The college policy concerning Dress Code as described in the COP Student Handbook/Manual shall apply to this course

Non-registered Students:

A non-registered student is not authorized or permitted to continue in the course past the final day for registration. No exceptions are permitted. No one will be allowed to remain in the class or participate in any class activity. If you have registered for the course and paid your fees but your name is not on the class roll, you may show the instructor an official University paid receipt for the course to remain temporarily in class while you follow University procedure to be placed on the University Official class roster as quickly as possible. Registration printout is not acceptable.

Class Attendance Restricted to Registered Students:

Only students whose names appear on the official course roster are permitted to attend class meetings. Students who are not registered are not permitted to attend or participate in course activities, do not have access to Blackboard, cannot submit course assignments, and will not receive a grade for this course. It is the students' responsibility to ensure that they are properly registered by the published registration deadline. Requests to add courses after the deadline will not be considered.

American Disability Act Statement:

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to disability must submit a request per instructions below:

Process for Requesting Reasonable Accommodations:

Student must submit by email to oss.disabilityservices@howard.edu the below listed items

- a. Completed *Student Request for Accommodations form**
- b. Signed *Rights and Responsibilities Form**
- c. Supporting documentation as appropriate to disability e.g. medical, chronic illness, psychological, learning disability etc
- d. 504 Plan or IEP Plan (optional) may be used as supporting evidence but may not contain enough information to support the request for accommodations

**Forms are available on the online at <https://studentaffairs.howard.edu/diversity-inclusion/accommodations-requests>, or may be requested by calling 202-238-2420 or emailing oss.disabilityservices@howard.edu*

Please see the Howard University Student Handbook for more information on the process.

Online Course Site: <http://blackboard.howard.edu>

This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.

“Writing Matters” – Writing Across the Curriculum (WAC)

“Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatical, and consistent with the conventions of the field. If your writing does not meet these standards, I may deduct points or ask you to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.”

Policy regarding course withdrawal:

Course withdrawal date has been posted at the University and College calendar. Please follow the deadline. (The deadline for course withdrawal for IT courses are five business days prior to the scheduled final exam posted at the beginning of the course)

Exam Software Policy:

Examsoft® software will be used for all examinations. Make sure your laptop computer is fully working and charged. Exam should be downloaded prior to the exam as specified by the instructor. The exams can be composed of multiple choice, fill-in, and/or short answer/essay.

Exam Review Policy:

Each student shall receive the copy of their grade sheets generated by ExamSoft™ along with the correct answers. A time will be announced to the class by the course coordinator for this purpose. An overall performance of the class will be provided by the course coordinator. Duplication of an exam questions via writing or electronic means will be considered an act of academic dishonesty. OR for exams taken remotely, the grades will be released via Examsoft and/or Blackboard once the exam monitor feedback is received. Students may schedule a one-on-one review of the examinations with the coordinator during the office hours or by appointment via zoom. There will be no examination review for the final examination. Students may be directed to instructors who taught specific sections of the course if the exam cannot be satisfactorily reviewed by the course coordinator. Duplication of exam questions via writing, electronic or other means will be considered an act of academic dishonesty.

Exam Questions:

Questions about specific exam questions must be addressed with the course coordinator. If the topic was not taught by the course coordinator, the instructor will be contacted. It is the coordinator's decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

Cheating in the Examinations:

All examinations shall be proctored by ExamMonitor software to prevent and discourage cheating. If cheating is determined, Examsoft will send a video footage of the cheating, will be verified by the course instructors, and will be handled in accordance with procedures set forth in the Howard University Academic Code of Conduct. Students should read the "Academic Code of Conduct" that is published in the H-Book and the Student Reference Manual and Directory of Classes. The "Academic Code of Conduct" is available at www.provost.howard.edu

Policy regarding Remediation:

Remediation proceedings for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP remediation policy for the semester.

Course Evaluation:

Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

Missed Course Work/Assignment Policy:

Students will be eligible to make up any missed assignments, quizzes, or exams at the discretion of the Course Coordinator. The makeup assignment or assessment will also be devised based upon the Course Coordinator's discretion. An excused absence will serve as the only acceptable reason for missed work. The burden of proof lies with the student, who must arrange a missed session with the Course Coordinator ahead of time (if the circumstance is foreseen) or provide proof of an unforeseen absence within 72 hours of returning to class. If the unforeseen circumstance is of a personal matter wherein proof cannot be provided to the Course Coordinator, then the Course Coordinator will verify with the Office of the Dean and/or Office of Student Affairs.

Omission and Commission Practicum Exam: The practicum exam covers Prescription Drug Cards & other drugs covered. The exam consists of 10 questions/scenarios. Students are allowed one minute per question/scenario where they will be required to: Review prescriptions for accuracy, Inspect prescription order for act Omission & Commission, Review prescription order(s) for accuracy of indication, quantity, overdose/underdose, and Others per instructions

Pharmacy Drug Cards:

Students are responsible for learning the LAST 150 drugs as listed in the Sigler's Drug Cards current Edition. **Learning strategy includes** Brand/Generic names, Therapeutic Class, Indication, and Side Effects.

LECTURE & LABORATORIES TOPICAL OUTLINE

Week	Date/Days	Topics	Patient Safety	
1	01/11	M	Course/Lab Orientation	
	01/12	T	Meds/Rx; Legal requirements, Record keeping, Labeling, Expiration, Cont. Subs	
2	01/19	T	Case for Pharmaceutical Care/MTM: Expanding pharmacist role, S.O.A.P Notes	
	01/22	F	Safe & Accurate Dispense of Rx/meds orders; (Collect & Assess)	
3	01/26	T	Evolution of Pharmacist Role; Medication Therapy Management	
	01/29	F	Safe & Accurate Disp. of Rx/Medications orders; (Plan & Implement)	
	01/29	F	IV Lab Orientation for ALL	
4	02/02	T	Community Pharm Comm Skills in Pharmacy Practice & Robotic Rx Dispensing System	
	02/05	F	Applying principles of evidence based PPCP prac(Collect, Assess, Plan, Implement)	
	02/05	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
5	02/09	T	Introduction of Health System/Hospital Pharmacy (Dr. Hailemeskel)	
	02/12	F	Introduction to Robotic Prescription Dispensing System (RPDS)	
	02/12	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
6	02/16	T	Practical Skills: Drug Delivery Systems; MDI, Opht, Topical, Nasal, and Perak Flow Meters	
	02/19	F	Applying principles of evidence based PPCP prac (Collect, Assess, Plan, Implement)	
	02/19	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
	02/22	M	Midterm Exam (7:30 to 9:00 A.M.)	
7	02/23	T	Practical & Applied Skills for Pharmacists: Insulins; Site selection, Prep, Mixing, & Injecting	
	02/26	F	Practical Skills; Drug Delivery Systems, MDI, Opht, Topical, Nasal, Flow meters	
	02/26	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
8	03/02	T	Practical & Applied Skills for Pharmacist: Blood Glucose Monitoring Devices	
	03/05	F	Practical & Applied Skills for Pharmacists: Insulin; Site selection, Prep. Mix. Inject.	
	03/05	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
10	03/6-14		Spring Recess University Closed	
9	03/16	T	PPCP Guided Pharmacy-based Self-Care Services	
	03/19	F	Practical & Applied Skills for Pharmacists: Blood Glucose Monitoring Devices	
	03/19	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
11	03/23	T	Practical & Applied Skills for Pharmacists: Blood Pressure Monitoring Devices	
	03/26	F	Patient Assessment; Blood Pressure & Vital Signs (role-play exercise)	
	03/26	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
12	03/30	T	Conflict Management in Pharmacy Practice	
	04/02	F	Patient-centered care: Patient factors in patient counselling (case-based exercise)	
	04/02	F	IV Lab: Practical & Applied Skills for Parenteral and Sterile Compounding	
13	04/06	T	Medication Safety and Errors	
	04/09	F	Conflict Management: Resolution of problem scenarios: Case-based discussion	
14	04/13	T	Medication Safety and Errors (continued)	
	04/16	F	Omission & Commission Practicum Exam	
15	04/20	T	Disposal of Prescription Drugs	

Howard University
College of Pharmacy (COP)
Department of Pharmaceutical Sciences
Course Plan Fall 2020

Title:	Pharmaceutical Chemistry I
Course Coordinator:	Dr. Simon Wang (806-6547; xiang.wang@howard.edu)
Sequence:	Fall Semester
Course Number:	89242 - PHSC 315
Year:	1 st Academic/Professional
Format:	3-credit course
Instructors:	Dr. Simon Wang (806-6547; xiang.wang@howard.edu) Dr. Amol Kulkarni (806-4493; amol.kulkarni@howard.edu)
Prerequisite:	Organic Chemistry

Required Textbooks/References

"Foye's Principles of Medicinal Chemistry", Victoria F. Roche, S. William Zito, Thomas L. Lemke and David A. Williams (editors), 8th edition, Lippincott Williams & Wilkins August 29, 2019.

Recommended Books or Study Aids

1. "The Organic Chemistry of Drug design and Drug Action" Richard B. Silverman, 2nd edition, Academic Press, 2004.
2. "Wilson and Gisvold's Organic and Pharmaceutical Chemistry" John H. Block, John M. Beale, Jr., 11th edition, Lippincott Williams & Wilkins 2004.
3. "Medicinal Chemistry Case Study Workbook" B.L. Currie, S.W. Zito (editors) Lippincott Williams & Wilkins 2002.

Supplemental Reading as Assigned by Individual Instructors and Course Coordinator

1. "The Billion Dollar Molecule: One Company's Quest for the Perfect Drug" Barry Werth, Revised edition, Simon & Schuster 1995.

2. "Genentech: The Beginnings of Biotech (Synthesis)"
Sally Smith Hughes, Illustrated edition, University of
Chicago Press 2013.

Required Technologies/Websites

- **Blackboard:** <http://blackboard.howard.edu>
- **ECHO 360:** via Blackboard website
- **HU COP:** <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®

Course Delivery

This course will be delivered via "HyFlex" model. There will be face-to-face lecture as well as online streaming by ECHO 360. Student will be able to decide whether to be in the classroom or online. However, if they choose to be in the classroom, days of attendance will be determined beforehand, and student must comply with the assigned days. Student must also comply with social distancing requirements and other health protocols to maintain the safety of students and faculty.

Course Delivery for a Resurgence of COVID-19

The course will immediately transition to fully online delivery in case a resurgence of COVID-19 occurs as determined by Howard University. All lectures will be delivered by ECHO 360/zoom/Microsoft Team. All assignments, quizzes and exams will continue to be online via ExamMonitor.

Classroom

Students who opt to attend lecture in person must occupy only the seats that have been assigned to them. Students are required to wipe down seating area (desk, chair, etc.) before and after each use. Students must wear masks or face coverings. The instructor will be the last to leave the classroom and will wipe down his/her desk and any equipment. The instructor will also wipe down doorknob when exiting. Students who need special accommodations that need to be taken into account, as the instructor is creating the seating chart, must contact the instructor before classes begin.

Course Description

This course deals with the study and application of physico-chemical properties and the relationship between chemical structure and pharmacological activities of organic medicinal agents of natural and synthetic origin. It encompasses synthetic organic chemistry and computational chemistry, in close combination with chemical biology, enzymology and structural biology, together aiming at the discovery and development of new therapeutic agents of both small organic molecules and biologics.

Entrustable Professional Activity (EPA) Domains and Core Statements

Domain 1: Patient Provider

Core Statement: Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.

CAPE Domains and Subdomains Matched: Outcome 1.1. Learner, Outcome 3.1. Problem Solver

Domain 3: Population Health Promoter

Core Statement: Minimize adverse drug events and medication errors.

CAPE Domains and Subdomains Matched: Outcome 3.1. Problem Solver

Domain 3: Population Health Promoter

Core Statement: Maximize the appropriate use of medications in a population.

CAPE Domains and Subdomains Matched: Outcome 3.1. Problem Solver

Curriculum Outcomes

The Howard University College of Pharmacy is committed to assuring that its Doctor of Pharmacy graduates achieve competence in the ability-based outcome areas set forth by the Accreditation Council of Pharmacy Education (ACPE) and the Center for the Advancement of Pharmaceutical Education (CAPE) Educational Outcomes. These learning outcomes provide an organizing structure around which to frame discussions of curriculum design, restructuring, implementation, and assessment. In addition, a well-designed curriculum built around these ability-based outcomes helps to ensure the student's transitional growth across the curriculum resulting in professional competency and the ability to provide excellent patient care upon entry into practice.

This document identifies fifteen program-level ability-based outcomes and their related learning objectives. Proficiency in these fifteen outcomes will ensure general educational competency as well as professional competency in the core domains of Foundational Knowledge, Essentials for Practice and Care, Approach to Practice and Care, and Personal and Professional Development.

FOUNDATIONAL KNOWLEDGE

Outcome 1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., *pharmaceutical, social/behavioral/administrative, and clinical sciences*) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and *patient-centered care*.

- Learning Objectives

1.1.1. Analyze mechanisms of disease and related mechanisms of actions of drugs for treatment

1.1.2. Develop an understanding of *population-specific* health needs

1.1.3. Apply knowledge of biomedical sciences to address *patient-related* therapeutic problems.

1.1.4. Integrate knowledge of *pharmaceutical, social/behavioral/administrative, and clinical sciences* to solve therapeutic problems.

1.1.5. Demonstrate comprehension of major scientific discoveries and use of the scientific method to make these discoveries.

APPROACH TO PRACTICE AND CARE

Outcome 3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

- Learning Objectives

- 3.1.1. Demonstrate reasoned and reflective consideration of evidence in a particular context to make a judgment
- 3.1.2. Apply critical thinking skills, including identification, investigation, application, analysis, creativity, synthesis and evaluation, to clinical or other professional problem-solving and decision making.

- References

1. Association of Colleges of Pharmacy. Educational Outcomes 1998. Alexandria VA: Center for the Advancement of Pharmaceutical Education Outcomes; 2013. Adopted June 18, 2014. Available at: <http://www.aacp.org/documents/CAPEoutcomes071213.pdf>
2. Howard University College of Pharmacy Student Handbook: Curriculum Outcomes (pages 21 – 29); 2013. Available at: <http://healthsciences.howard.edu/~media/Files/education/pharmacy/scholarships/SOP%20STUDENT%20HANDBOOK%202013-UPDATED.ashx>
3. North American Pharmacist Licensure Examination (NAPLEX) competency statement, National Association of Boards of Pharmacy (NABP), Registration Bulletin, 2006.
4. Multistate Pharmacy Jurisprudence Examination (MPJE) competency statement, National Association of Boards of Pharmacy (NABP) Registration Bulletin, 2006.
5. Program-Level Ability-based Outcomes for Pharm.D. Education, College of Pharmacy, The Ohio State University, 2006.
6. Ability-Based Outcomes for the Doctor of Pharmacy Curriculum, University of North Carolina Eshelman School of Pharmacy, accessed via web May 26, 2012
7. Pharm.D. Program Outcome Ability Goals, Purdue University College of Pharmacy, 2007
8. The UCSF Doctor of Pharmacy Curriculum, University of California San Francisco School of Pharmacy, accessed via eb May 26, 2012
9. Curriculum Outcomes, Midwestern University Chicago College of Pharmacy, accessed via web May 26, 2012
10. Oath of a Pharmacist, American Association of Colleges of Pharmacy (AACP), 2007

Course Objectives/Learning Goals

Upon completion of this course, the student shall have acquired competency in the application of structural, configurational and pharmacological molecular architecture, structure-activity relationships and chemical and pharmacological concepts involved in drugs and pharmaceutical agents to provide a rational selection of the appropriate medication. The student shall demonstrate these competencies by the ability to:

1. Identify the structure, given a chemical name and predict the pharmacological and/or biochemical action of the given drug.
2. Recognize specific physico-chemical properties that are important to the action of specific drugs and/or their use as therapeutic agents.
3. Identify the major chemical class from a given name or chemical structure of the drug.
4. Identify the pharmaceutically important characteristics and/or properties of the drug given the generic name (or trade name) or structural formula.
5. Predict the logical metabolite(s) of the drug from the given structure or name

6. Given the pK_a and/or its structure, describe the behavior of the drug in either an acidic, basic, or a neutral environment and its effect on the stability, absorption, distribution, metabolism, and elimination.
7. Predict the fundamental relationships between the chemical structure and pharmacological action in a given class of drugs.
8. Explain the chemical change(s) and/or type(s) of change(s) which might be predicted during formulation, and storage, from the name, class, and/or structure of the drug, and specified conditions, and recommend appropriate action.
9. Describe the biosynthetic pathways of appropriate medicinal agents.
10. Describe the process of biotechnology drug production using recombinant DNA technology and other techniques.

Course Contents/Topical Outline

- General Principles

- a. Physico-Chemical Factors In Drug Action
- b. Passage of Drugs Across the Cells
- c. Binding Forces involved in [Drug:Receptor] Interactions
- d. Basic Pharmacologic Principles
- e. Metabolism (Biotransformation)
- f. Drug Development Processes

- Drug Classes

- g. Neurotransmission
- h. Adrenergic Nervous System
- i. Adrenergic Agonists
- j. Adrenergic Antagonists
- k. Cholinergic Nervous System
- l. Muscarinic Agonists.
- m. Muscarinic Antagonists
- n. Ganglionic Agonists.
- o. Ganglionic Antagonists
- p. Neuromuscular Agonists
- q. Neuromuscular Antagonists
- r. Central Nervous System (CNS) Blockades.
- s. Local Anesthetics
- t. General Anesthetics
- u. Antiparkinson Relaxants
- v. Sedatives and Hypnotics
- w. Antipsychotics
- x. Anxiolytics
- y. Antidepressants
- z. Anticonvulsant Agents
- aa. Opioid Analgesics
- bb. Histamine, Antihistamine Agents
- cc. Prostaglandins, Peptides and Kinins
- dd. Asthma, and Its Treatment
- ee. Inflammation

Instructional/Methodology/Activities

The course is comprised of a lecture series which are intended to enable the application of knowledge acquired. Lecture styles may vary, and students are expected to adapt to the manner of presentation. Students are advised to discuss any difficulties in following a particular lecture with the responsible faculty lecturer. It is assumed that the student is familiar with normal anatomic constructions, physiologic processes, biological and cellular chemistry. It is assumed that this knowledge had been acquired in the student's foundation courses in the basic sciences and/or all prerequisite courses.

- **Course Instructors:** This course will be team-taught while some lecturers come from area institutions and practices. Students are expected to function in a professional manner for all classroom sessions. Please note although course coordinator will proctor all assessments specific content questions should be directed to the instructor who taught the materials.
- **Reading Assignments:** Students are expected to review assigned reading materials and supplemental articles provided by the instructor prior to the start of the scheduled lecture or series.
- **Class Participation:** Students are expected to participate in all activities and are held responsible, even when absent.
- **Assessments:** All assessments are comprised of written assessments and quizzes. Distribution of each grade percentage is described below.

Policies on Examinations, Grades, Class Attendance, and Dress Code

1. The College/University policies concerning student Conduct and Cheating during examinations described in the **COP Student Handbook/Manual** and the Howard University By-Laws on Student Code of Conduct and Judiciaries described in the **H-Book** shall apply to this course. In addition, **only** nonprogrammable calculators shall be allowed in the exams. A student who violates this policy will receive a grade of "zero" on that exam.
2. All scheduled exams shall be based on materials covered since the last exam as described in the Lectures/Exams Schedule and shall be announced before each examination. The final examination shall be comprehensive, i.e., it shall cover all the material of the course.
3. The exam schedule appears in the Lectures/Exams Schedule as outlined. However, the class, through its President, may request changing any or all of the scheduled examinations because of conflict with other courses **only within the first ten (10) working days** of the semester. The Course Coordinator shall attempt to accommodate this request while taking into account the need to include in each examination a reasonable amount of course material. After distributing the final revision, no change in the examination schedule shall be permitted except under unforeseen circumstances determined by the Course Coordinator.
4. Students have the responsibility to take all scheduled examinations on the announced date and time. To ensure fairness in the conduct of examinations, no tardy student shall be allowed into the examination room after any other student has left the room. A student who reports to the examination hall late shall not be given any extra time.

5. A student who fails to appear and take the exam on its scheduled date and time, shall earn the grade of "zero" unless his/her absence is considered "excused."
6. Students may review and compare their answers with the exam key during the specific times announced by the instructor and requests for grade changes will be considered only during this time. This will be announced during class.

Although calling the Instructor or the Course Coordinator on or before the exam is desirable, it does not constitute a permission to miss the exam

Policy Regarding Excused Absences in Examinations

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Grades

Numerical equivalents of letter grades shall be as follows:

90-100% = A

86-89% = B+

80-85% = B

76-79% = C+

70-75% = C

69% and below = F

Class Attendance

1. No non-registered student is authorized or permitted to continue in any course offered by the Department of Pharmaceutical Sciences beyond the final day for registration. No exceptions will be made.
2. A non-registered student will be interpreted by the instructor of the course as a student whose name does not appear on the official class list provided by the Registrar's Office after the final day of registration.
3. All students registered for a course are expected to show up for class **ON TIME** and to attend all classes. Students missing class for any reason are responsible for the material missed.

Dress Code

The college policy concerning Dress Code as described in the SOP Student Handbook/Manual shall apply to this course

Non-registered Students

A non-registered student is not authorized or permitted to continue in the course past the final day for registration. No exceptions are permitted. No one will be allowed to remain in the class or participate in any class activity. If you have registered for the course and paid your fees but your name is not on the class roll, you may show the instructor an official University paid receipt for the course to remain temporarily in class while you follow University procedure to be placed on the University Official class roster as quickly as possible. Registration printout is not acceptable.

Class Attendance Restricted to Registered Students

Only students whose names appear on the official course roster are permitted to attend class meetings. Students who are not registered are not permitted to attend or participate in course activities, do not have access to Blackboard, cannot submit course assignments, and will not receive a grade for this course. It is the students' responsibility to ensure that they are properly registered by the published registration deadline. Requests to add courses after the deadline will not be considered.

American Disability Act Statement

The HyFlex model accommodates students by giving them the option of attending face to face or online classes. Students who usually receive ADA accommodations should continue to contact the Office of Student Services to make those arrangements. Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the office of the Dean for Special Services for verification and determination of reasonable accommodations as soon as possible after admission to the University, or at the beginning of each semester. The Dean of Special Services, Dr. Elaine Heath, can be reached at (202) 238-2420.

Online Course Site: Blackboard.howard.edu

This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.

“Writing Matters” – Writing Across the Curriculum (WAC)

“Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatical, and consistent with the conventions of the field. If your writing does not meet these standards, I may deduct points or ask you to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.”

Policy regarding course withdrawal

Course withdrawal date has been posted at the University and College calendar. Please follow the deadline. (The deadline for course withdrawal for IT courses is five business days prior to the scheduled final exam posted at the beginning of the course)

Exam Software Policy

Examsoft® software will be used for all examinations. Make sure your laptop computer is fully working and charged. Exam should be downloaded prior to the exam as specified by the instructor. The exams can be composed of multiple choice, fill-in and/or short answer/essay.

Exam Review Policy

Each student shall receive the copy of their grade sheets generated by ExamSoft™ along with the correct answers. A time will be announced to the class by the course coordinator for this purpose. An overall performance of the class will be provided by the course coordinator. Duplication of an exam questions via writing or electronic means will be considered an act of academic dishonesty.

Exam Questions

Questions about specific exam questions must be addressed with the course coordinator. If the topic was not taught by the course coordinator, the instructor will be contacted. It is the coordinator's decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

Cheating in the Examinations

All examinations shall be proctored by ExamMonitor software to prevent and discourage cheating. If cheating is determined, Examsoft will send a video footage of the cheating, will be verified by the course instructors and will be handled in accordance with procedures set forth in the Howard University Academic Code of Conduct. Students should read the "Academic Code of Conduct" that is published in the H-Book and the Student Reference Manual and Directory of Classes. The "Academic Code of Conduct" is available at www.provost.howard.edu

Policy regarding Remediation

Remediation proceedings for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP remediation policy for the semester.

Course Evaluation

Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

Missed Course Work/Assignment Policy

Assignments are expected to be completed by due date. Assignments submitted 4 days after the due date will not be accepted. For every day the assignment is late after the assignment is due, 25% will be deducted from the assignment score.

Lecture/Examination Schedule

Fall 2020; Revised Aug. 20, 2020

Classroom: Virtual by ECHO 360

Class Schedule: Tuesday 3:00PM-4:20PM and Thursday 3:00PM – 4:20PM

Day	Date	Lec #	Topic	Instructor
T	8/25/2020	1	Drug Action and Enzymology	Wang
Th	8/27/2020	2	Drug Discovery from Receptor Targeting	Wang
T	9/1/2020	3	Basics of Medicinal Organic Chemistry	Kulkarni
Th	9/3/2020	4	Principles of Reactivity	Kulkarni
T	9/8/2020	5	Drug Metabolism and Toxicology	Kulkarni
Th	9/10/2020	6	Drug Metabolism and Toxicology	Kulkarni
T	9/15/2020	7	Cholinergic Drugs	Kulkarni
Th	9/17/2020	8	Cholinergic Drugs	Kulkarni
T	9/22/2020	9	Inflammation and NSAIDs	Kulkarni
Th	9/24/2020	10	NSAIDs	Kulkarni
T	9/29/2020	11	Opioid Analgesics	Kulkarni
W	9/30/2020		Examination #1 (25%) Lectures #1-8 3:00 p.m. - 4:30 p.m.	Wang, Kulkarni
Th	10/1/2020	12	Opioid Analgesics	Kulkarni
T	10/6/2020	13	Serotonergic Agents	Kulkarni
Th	10/8/2020	14	Antidepressant Agents	Kulkarni
T	10/13/2020	15	Antidepressant Agents	Kulkarni
Th	10/15/2020	16	Hallucinogenic Agents and Drugs of Abuse	Wang
T	10/20/2020	17	Adrenergic Agents	Wang
W	10/21/2020		Examination #2 (25%) Lectures #9-17 3:00 p.m. - 4:30 p.m.	Kulkarni, Wang
Th	10/22/2020	18	Adrenergic Agents	Wang
T	10/27/2020	19	Anti-seizure Agents	Wang
Th	10/29/2020	20	Anti-seizure Agents	Wang
T	11/3/2020	21	Sedative-Hypnotics	Wang
Th	11/5/2020	22	Antipsychotic and Anxiolytic Agents	Wang
T	11/10/2020	23	Local Anesthetics	Wang
Th	11/12/2020	24	General Anesthetics	Wang
T	11/17/2020	25	Amino Acid Neurotransmitters	Wang
Th	11/19/2020	26	Antihistamines and Allergy Agents	Wang
T	11/24/2020	27	Inhibitors of Phosphodiesterase	Wang
W	11/18/2020		Examination #3 (25%); Lecture #18-27 3:00 p.m. - 4:30 p.m.	Wang
Th	11/26/2020		<i>Thanksgiving Recess</i>	
	12/3/2020 - 12/11/2020		Final Exam (25%); Lecture #1-27	Kulkarni, Wang

Howard University
College of Pharmacy
Department: Pharmaceutical Sciences
Course Plan

Title: Pharmaceutical Chemistry II

Credit Hours: 3

Sequence: Spring semester

Effective Date: January 11, 2021

Course Coordinator: Amol Kulkarni, PhD

Contact Information: Room 321C, Interdisciplinary Research Building

Office hours: Mondays, 2.30 to 4.30 pm

Location: : Zoom, ECHO360

Email: amol.kulkarni@howard.edu

Year: 2021

Instructors: Amol Kulkarni, PhD and Xiang Wang, PhD

Prerequisites (if any): N/A

Online Course Site: [Blackboard.howard.edu](https://blackboard.howard.edu)

Required Textbook (if necessary) “Foye’s Principles of Medicinal Chemistry” David A. Williams, Thomas L. Lemke, Victoria Roche, S. William Zito, 7th Ed. Lippincott, Williams & Wilkins 2016.

Recommended Textbook(s)/References (if necessary) “The Organic Chemistry of Drug Design and Drug Action” Richard B. Silverman, 3rd Ed. Academic Press.

Required Technologies/Websites:

- **Blackboard:** <http://blackboard.howard.edu>
- **ECHO 360:** via Blackboard website
- **HU COP:** <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®

Course Delivery

The College of Pharmacy has adopted the HyFlex model for our courses. However, due to the resurgence of COVID-19 in the District of Columbia and other states, this course currently will be delivered fully via online using ECHO 360 live streaming. Adjunct faculty may use zoom for their lectures. Students will not be allowed to come to College for face to face classroom learning at this time. All assignments, quizzes and exams will also be online using Examsoft and ExamMonitor.

Course Description: Pharmaceutical Chemistry II is a continuation of Pharmaceutical Chemistry I. This course deals with the relationship between chemical structure and pharmacological activity of medicinal agents. The major course content of Pharmaceutical Chemistry II addresses (1) knowledge of the major classes of drugs and their uses; (2) mechanism of action and molecular targets of major therapeutic drug classes; (3) the relationship of structural and physicochemical properties to the mode of action for important therapeutic classes of medicinal agents; and (4) major drug interactions and pharmacokinetic properties to assist in rational prescription and use of medicines, pharmacovigilance and proper patient counseling.

Course Objectives:

HUCOP Curricular Outcomes and Learning Objectives

DOMAIN 1: FOUNDATIONAL KNOWLEDGE

Outcome 1.1 Learner – Develop, integrate, and apply knowledge from the foundational sciences (i.e. pharmaceutical, social/behavioral/administrative and clinical sciences)

DOMAIN 2: ESSENTIALS FOR PRACTICE AND CARE

Outcome

Learning Objectives

DOMAIN 3: APPROACH TO PRACTICE AND CARE

Outcome 3.1 Problem solving (Problem solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Learning Objectives

3.1.1. Demonstrate reasoned and reflective consideration of evidence in a particular context to make a judgment.

3.1.2. Apply critical thinking skills, including identification, investigation, application, analysis, creativity, synthesis and evaluation, to clinical or other professional problem-solving and decision making.

DOMAIN 4: PERSONAL AND PROFESSIONAL DEVELOPMENT

Outcome

Learning Objectives

Course Learning Objectives (EPAs):

In order to achieve the abovementioned learning outcomes, this course will cover the following learning objectives based upon the Entrustable Professional Activities for New Pharmacy Graduates (EPAs)³:

EPA domain 2: Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related research.

EPA domain 8: Minimize adverse drug events and medication errors

EPA domain 9: Maximize the appropriate use of medications in a population

Instruction/Methodology/Activities:

- **Course Instructors:** Xiang Wang, PhD and Amol Kulkarni, PhD
- **Reading Assignments:** The instructors may assign reading assignments as necessary. The students are expected to complete assignments before the class.
- **Class Participation:** The students are expected to actively participate in the class.
- **Assessments:** There will be three exams and a comprehensive final exam in this course. The final grade will be computed based on the following weightage:
 - Exam 1: 25% weightage on the final exam**
 - Exam 2: 25% weightage on the final exam**
 - Exam 3: 25% weightage on the final exam**
 - Final exam: 25% weightage on the final exam**In addition to the above exams, the instructors may give additional assignments, such as, unannounced quizzes during the class.
- **Inter-professional Perspective (if applicable): NOT APPLICABLE**
- **Pharmacist's Patient Care Process (if applicable. See below) NOT APPLICABLE**

Pharmacist's Patient Care Process

The following aspects of the PPCP will be covered during this course:

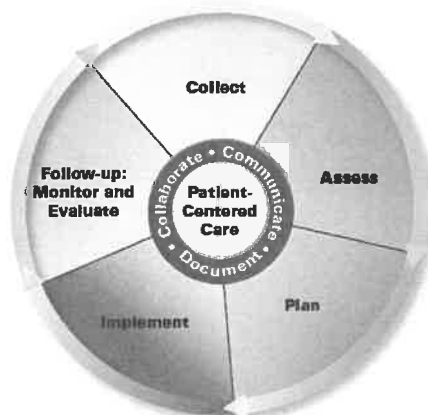


Figure 1: Pharmacists' patient care process

Instructional Methodologies and Assessment

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accommodations due to a disability should contact the office of the Dean for Special Services for verification and determination of reasonable accommodations as soon as possible after admission to the University, or at the beginning of each semester.

Process for Requesting Reasonable Accommodations

Student must submit by email to oss.disabilityservices@howard.edu the below listed items

- a. Completed *Student Request for Accommodations form**
- b. Signed *Rights and Responsibilities Form**
- c. Supporting documentation as appropriate to disability e.g. medical, chronic illness, psychological, learning disability etc
- d. 504 Plan or IEP Plan (optional) may be used as supporting evidence but may not contain enough information to support the request for accommodations

**Forms are available online at <https://studentaffairs.howard.edu/diversity-inclusion/accommodations-requests>, or may be requested by calling 202-238-2420 or emailing oss.disabilityservices@howard.edu*

Please see the Howard University Student Handbook for more information on the process.

Online Course Site: Blackboard.howard.edu

This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.

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Policy regarding course withdrawal

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Exam Software Policy

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Each student shall receive the copy of their grade sheets generated by ExamSoft™ along with the correct answers. A time will be announced to the class by the course coordinator for this purpose. An overall performance of the class will be provided by the course coordinator. Duplication of an exam questions via writing or electronic means will be considered an act of academic dishonesty.

Or

For exams taken remotely, the grades will be released via Examsoft and/or Blackboard once the exam monitor feedback is received. Students may schedule a one-on-one review of the examinations with the coordinator during the office hours or by appointment via zoom. There will be no examination review for the final examination. Students may be directed to instructors who taught specific sections of the course if the exam cannot be satisfactorily reviewed by the course coordinator. Duplication of exam questions via writing, electronic or other means will be considered an act of academic dishonesty.

Exam Questions

Questions about specific exam questions must be addressed with the course coordinator. If the topic was not taught by the course coordinator, the instructor will be contacted. It is the coordinator's decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

Cheating in the Examinations:

All examinations shall be proctored by ExamMonitor software to prevent and discourage cheating. If cheating is determined, Examsoft will send a video footage of the cheating, will be verified by the course instructors and will be handled in accordance with procedures set forth in the Howard University Academic Code of Conduct. Students should read the "Academic Code of Conduct" that is published in the H-Book and the Student Reference Manual and Directory of Classes. The "Academic Code of Conduct" is available at www.provost.howard.edu

Policy regarding Remediation:

Remediation proceedings for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP remediation policy for the semester.

Course Evaluation:

Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

Missed Course Work/Assignment Policy: If a student misses the class (s)he will be responsible for the missed material. This course will follow The College of Pharmacy's policy on missed exams.

Course Contents/Topical Outline

Lecture/Examination Schedule

Week-lecture	Date	Day	Lecturer	Topic
WEEK 1-1	01/12	Tu	Kulkarni	Cardiovascular Agents
WEEK 1-2	01/13	W	Kulkarni	Cardiovascular Agents
WEEK 1-3	01/14	Th	Kulkarni	Antiarrhythmic Agents
WEEK 2-4	01/19	Tu	Kulkarni	Antiarrhythmic Agents
WEEK 2-5	01/20	W	Kulkarni	Antihypertensive Agents
WEEK 2-6	01/21	Th	Kulkarni	Antihypertensive Agents
WEEK 3-7	01/26	Tu	Kulkarni	Diuretic Agents
WEEK 3-8	01/27	W	Kulkarni	Diuretic and Anti-OAB Agents
WEEK 3-9	01/28	Th	Kulkarni	Antihyperlipidemic Agents
WEEK 4-10	02/02	Tu	Kulkarni	Antihyperlipidemic Agents
WEEK 4-11	02/03	W	Kulkarni	Antibiotics-1
WEEK 4-12	02/04	Th	Kulkarni	Antibiotics-2
WEEK 5-13	02/09	Tu	Kulkarni	Antibiotics-3
Week 5	02/10	W	-	Exam 1 (Lectures 1-12)
WEEK 5-14	02/11	Th	Kulkarni	Antifungal Agents
WEEK 6-15	02/16	Tu	Kulkarni	Exam 1 Review
WEEK 6-16	02/17	W	Wang	Sulfonamide
WEEK 6-17	02/18	Th	Wang	Quinolones
WEEK 7-18	02/23	Tu	Wang	Insulin

WEEK 7-19	02/24	W	Wang	Insulin
WEEK 7-20	02/25	Th	Wang	Oral Hypoglycemics and Sugar Substitutes
WEEK 8-21	03/02	Tu	Wang	Anticoagulants/Fibrinolytic Agents
WEEK 8-22	03/03	W	Wang	Anticoagulants/Fibrinolytic Agents
WEEK 8-23	03/04	Th	Wang	Thyroxin and Anti-Thyroid Agents
WEEK 9-24	03/09	Tu	Wang	Anticancer Agents
WEEK 9-25	03/10	W	Wang	Anticancer Agents
WEEK 9-26	03/11	Th	Wang	Anticancer Agents

WEEK 10 SPRING BREAK, NO CLASS

WEEK 11	03/22	Mo	Kulkarni/Wang	Exam 2 (Lectures 13-26)
	03/23	Tu	-	NO CLASS
WEEK 11-27	03/24	W	Wang	Anticancer Agents
WEEK 11-28	03/25	Th	Wang	Immunological Biologics
WEEK 12-29	03/30	Tu	Wang	Corticosteroid Hormones
WEEK 12-30	03/31	W	Wang	Principles of Pharmaceutical Biotechnology
WEEK 12-31	04/01	Th	Kulkarni	Androgens
WEEK 13-32	04/06	Tu	Kulkarni	Androgens
WEEK 13-33	04/07	W	Kulkarni	Female Sex Hormones
	04/08	Th	-	Research Week, NO CLASS
WEEK 14-34	04/13	Tu	Kulkarni	Female Sex Hormones
	04/14	W	Kulkarni/Wang	Exam 3 (Lecture 27-34)
WEEK14-35	04/15	Th	Wang	Antiviral Agents
WEEK 15-36	04/20	Tu	Wang	Antiviral Agents
WEEK 15-37	04/21	W	Wang	Antiviral Agents
WEEK 15-38	04/22	Th	Wang	Antiviral Agents

FINAL EXAMINATION: To Be Announced (Lectures 1-38)

**Howard University
College of Pharmacy
Department of Pharmaceutical Sciences**

Pharmaceutical Calculations 1 Course Plan

Title: Pharmaceutical Calculations I

Course #: 89359-323

Credit Hour: 2 credits

Sequence: Fall semester

Effective Date: 08.24.2020

Course Schedule: Thursdays 8am – 9:50 am

Course Coordinator: Simeon K. Adesina R.Ph., Ph.D.

Contact Information: Room #304, College of Pharmacy
Phone: 202-250-5304
Email: simeon.adesina@howard.edu

Office hours: Dr. Adesina: Wednesdays 11am – 1pm (Phone) or via zoom (appointment)

Location: Remote/Online

Email: simeon.adesina@howard.edu

Year: P1

Instructors: Dr. Simeon K. Adesina (simeon.adesina@howard.edu)
Dr. Indiran Pather (Indiran.pather@howard.edu)
Dr. Muhammad Habib (mhabib@howard.edu)
Dr. Emmanuel Akala (eakala@howard.edu)

Prerequisites (if any): None

Online Course Site: Blackboard.howard.edu

Required Textbook: Pharmaceutical Calculations, 15th Edition, Howard C. Ansel & Shelly J. Stockton.

Required Technologies/Websites:

- **Blackboard:** <http://blackboard.howard.edu>
- **ECHO 360:** via Blackboard website
- **Zoom**
- **HU COP:** <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®

Course Delivery

The College of Pharmacy has adopted the HyFlex model for our courses. However, due to the resurgence of COVID-19 in the District of Columbia and other states, this course currently will be delivered fully via online using ECHO 360 live streaming. Adjunct faculty may use zoom for their lectures. Students will not be allowed to come to College for face to face classroom learning at this time. All assignments, quizzes and exams will be online via ExamSoft. Remote proctoring will be via Exam Monitor in ExamSoft.

Course Description: This course is an introductory development course. Quantitative skills necessary for an understanding of the basic and clinical pharmaceutical sciences, including applications of natural and common logarithms, graphical methods will be explored. Various techniques necessary in pharmaceutical calculations employed by the pharmacist in formulation, compounding, manufacturing and dispensing of medications will be discussed. The course will also provide the student with the development of skills to recognize errors in prescribing in both oral and written medication orders.

Course Objectives: This course will provide the student with the knowledge base necessary to:

1. Read and interpret a medication order.
2. Recognize errors in prescribing (oral and written) and demonstrate ability to remedy each as they occur.
3. Perform necessary calculations to accurately prepare medication orders.
4. Calculate the dose of medications using one of a variety of methods.
5. Demonstrate proper use of graphical methods commonly used in medical literature.
6. Accurately perform calculations which involve the use of common or natural logarithms.

HUCOP Curricular Outcomes and Learning Objectives

The Howard University College of Pharmacy is committed to assuring that its Doctor of Pharmacy graduates achieve competence in the ability-based outcome areas set forth by the Accreditation Council of Pharmacy Education (ACPE) and the Center for the Advancement of Pharmaceutical Education (CAPE) Educational Outcomes. These learning outcomes provide an organizing structure around which to frame discussions of curriculum design, restructuring, implementation, and assessment. In addition, a well-designed curriculum built around these ability-based outcomes helps to ensure the student's transitional growth across the curriculum resulting in professional competency and the ability to provide excellent patient care upon entry into practice.

This document identifies fifteen program-level ability-based outcomes and their related learning objectives. Proficiency in these fifteen outcomes will ensure general educational competency as well as professional competency in the core domains of Foundational Knowledge, Essentials for Practice and Care, Approach to Practice and Care, and Personal and Professional Development.

DOMAIN 1: FOUNDATIONAL KNOWLEDGE

Outcome 1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., *pharmaceutical, social/behavioral/administrative, and clinical sciences*) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and *patient centered care*.

Learning Objectives

1.1.6. Perform error-free mathematical calculations with regard to drug dosing, pharmacokinetics, and compounding dosage forms

DOMAIN 2: ESSENTIALS FOR PRACTICE AND CARE

Outcome 2.1. Patient-centered care (Caregiver) - Provide *patient-centered care* as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

Learning Objectives

2.1.7. Select the proper drug, dose, and dosage form for a specific patient.

DOMAIN 3: APPROACH TO PRACTICE AND CARE

Outcome 3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Learning Objectives

3.1.1. Demonstrate reasoned and reflective consideration of evidence in a particular context to make a judgment.

3.1.2. Apply critical thinking skills, including identification, investigation, application, analysis, creativity, synthesis and evaluation, to clinical or other professional problem-solving and decision making.

Course Learning Objectives (EPAs):

In order to achieve the above-mentioned learning outcomes, this course will cover the following learning objectives based upon the Entrustable Professional Activities for New Pharmacy Graduates (EPAs):

Learning Objective 1: Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.

Learning Objective 2: Minimize adverse drug events and medication errors.

Learning Objective 3: Fulfill a medication order.

Instruction/Methodology/Activities:

The instructional activities will be primarily lecture based. The lectures are intended to enable the application of knowledge and understanding. There will be problem solving sessions in the class with active student participation throughout the course. Students will have opportunities to solve problems in the class and to demonstrate solutions to the

entire class. Lecture styles may vary among the instructors. It is assumed and expected that students are familiar with basic arithmetic calculations before entering this class.

Class Participation: Students are expected to attend and participate in all activities and are held responsible for missed material.

Assessments: Final computation of course grades will be based on the following:

- | | | |
|------------------------------------|----------|-------|
| a. Three examinations..... | 20% each | = 60% |
| b. Final Comprehensive Examination | | = 30% |
| c. Attendance | | = 5% |
| d. PBP/Quizzes/ Assignments | | = 5% |

Examinations and quizzes during the semester shall be based on materials covered during a specified period and are NOT comprehensive to the date of the exam. The final examination WILL BE comprehensive and based on all materials covered throughout the semester. Attendance grade will be given based on 100% attendance or excused absences or as determined by the coordinator. Fractional grades for attendance may not be given.

Policies on Examinations, Grades, Class Attendance, and Dress Code

1. The College/University policies concerning student Conduct and Cheating during examinations described in the **COP Student Handbook/Manual** and the Howard University By-Laws on Student Code of Conduct and Judiciaries described in the **H-Book** shall apply to this course. In addition, **only** nonprogrammable calculators shall be allowed in the exams. A student who violates this policy will receive a grade of "zero" on that exam.
2. All scheduled exams shall be based on materials covered since the last exam as described in the Lectures/Exams Schedule and shall be announced before each examination. The final examination shall be comprehensive, i.e., it shall cover all the material of the course.
3. The exam schedule appears in the Lectures/Exams Schedule as outlined. However, the class, through its President, may request changing any or all of the scheduled examinations because of conflict with other courses **only within the first ten (10) working days** of the semester. The Course Coordinator shall attempt to accommodate this request while taking into account the need to include in each examination a reasonable amount of course material. After distributing the final revision, no change in the examination schedule shall be permitted except under unforeseen circumstances determined by the Course Coordinator.
4. Students have the responsibility to take all scheduled examinations on the announced date and time. To insure fairness in the conduct of examinations, no tardy student shall be allowed into the examination room after any other student has left the room. A student who reports to the examination hall late shall not be given any extra time.
5. A student who fails to appear and take the exam on its scheduled date and time, shall earn the grade of "zero" unless his/her absence is considered "excused."

6. Students may review and compare their answers with the exam key during the specific times announced by the instructor and requests for grade changes will be considered only during this time. This will be announced during class.

Calling the Instructor or the Course Coordinator on or before the exam is desirable, it does not constitute a permission to miss the exam

Policy Regarding Excused Absences in Examinations:

Procedures for absences in an examination for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP Excused Absence Policy for the semester.

Grades:

Numerical equivalents of letter grades shall be as follows:

- 89.5-100% = A
- 85.5-89.4% = B+
- 79.5-85.4% = B
- 75.5-79.4% = C+
- 69.5-75.4% = C
- 69.4% and below = F

Class Attendance:

1. No non-registered student is authorized or permitted to continue in any course offered by the Department of Pharmaceutical Sciences beyond the final day for registration. No exceptions will be made.
2. A non-registered student will be interpreted by the instructor of the course as a student whose name does not appear on the official class list provided by the Registrar's Office after the final day of registration.
3. All students registered for a course are expected to show up for class **ON TIME** and to attend all classes. Students missing class for any reason are responsible for the material missed and may not earn attendance points for grade purposes.

Class Attendance Restricted to Registered Students

Only students whose names appear on the official course roster are permitted to attend class meetings. Students who are not registered are not permitted to attend or participate in course activities, do not have access to Blackboard, cannot submit course assignments, and will not receive a grade for this course. It is the students' responsibility to ensure that they are properly registered by the published registration deadline. Requests to add courses after the deadline will not be considered.

Dress Code

The college policy concerning Dress Code as described in the COP Student Handbook/Manual shall apply to this course

Non-registered Students

A non-registered student is not authorized or permitted to continue in the course past the final day for registration. No exceptions are permitted. No one will be allowed to remain in the class or participate in any class activity. If you have registered for the course and paid your fees but your name is not on the class roll, you may show the instructor an official University paid receipt for the course to remain temporarily in class while you follow University procedure to be placed on the University Official class roster as quickly as possible. Registration printout is not acceptable.

American Disability Act Statement

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the office of the Dean for Special Services for verification and determination of reasonable accommodations as soon as possible after admission to the University, or at the beginning of each semester. The Dean of Special Services, Dr. Elaine Heath, can be reached at (202) 238-2420.

Online Course Site: Blackboard.howard.edu

This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.

“Writing Matters” – Writing Across the Curriculum (WAC)

“Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatical, and consistent with the conventions of the field. If your writing does not meet these standards, points may be deducted, or you may be asked to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.”

Policy Regarding Course Withdrawal

Course withdrawal date has been posted at the University and College Calendar. Please follow the deadline.

Exam Software Policy

Examsoft® software will be used for all examinations. It is your responsibility to make sure that you have a working laptop computer equipped with a webcam. Make sure your laptop computer is fully working and charged. Exam should be downloaded prior to the exam as specified by the instructor. The exams can be composed of multiple choice, fill-

in and/or short answer/essay or any other format as determined by the coordinator. If the exam is done remotely, then the online remote exam taking policy will apply. Students must activate and/or enable Exam ID and Exam Monitor for all assessments in this course.

Exam Review Policy

For exams taken remotely, the grades will be released via Blackboard once the exam monitor feedback is received. Students may schedule a one-on-one review of the examinations with the coordinator during the office hours or by appointment via zoom. There will be no examination review for the final examination. Students may be directed to instructors who taught specific sections of the course if the exam cannot be satisfactorily reviewed by the course coordinator. Duplication of exam questions via writing, electronic or other means will be considered an act of academic dishonesty.

Exam Questions

During an ongoing exam, no explanations/clarifications on any question will be given. Questions about specific exam questions must be addressed with the course coordinator after the exams. If the topic was not taught by the course coordinator, the instructor will be contacted. It is the coordinator's decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

Cheating in the Examinations:

All examinations shall be proctored by ExamMonitor software to prevent and discourage cheating. If cheating is determined, Examsoft will send a video footage of the cheating, this will be verified by the course instructors and will be handled in accordance with procedures set forth in the Howard University Academic Code of Conduct. Students should read the "Academic Code of Conduct" that is published in the H-Book and the Student Reference Manual and Directory of Classes. The "Academic Code of Conduct" is available at www.provost.howard.edu

Policy regarding Remediation:

Remediation proceedings for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP remediation policy for the semester.

Course Evaluation:

Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

Course Contents/Topical Outline

1. Review of Fundamentals of Measurement and Calculation

- a. Arabic and Roman Numerals
- b. Common and Decimal Fractions
- c. Ratio and Proportion
- d. Percentage of Error

2. Interpretation of the Prescription or Medication Order

- a. Orders for Medication
- b. Components of an Order for Medication
- c. Commonly Used Abbreviations

3. The International System of Units

- a. Measure of Length
- b. Measure of Volume
- c. Measure of Weight
- d. Fundamental Computations

4. Calculation of Doses

- a. Calibration of Droppers
- b. Calculations in Miscellaneous Dosage Problems
- c. Special Dosing for Pediatric and Elderly Patient
- d. Drug Dosage Based on Age
- e. Drug Dosage Based on Body Weight
- f. Drug Dosage Based on Body Surface Area

5. Reducing and Enlarging Formulas

- a. Formulas which Specify Amounts of Ingredients
- b. Formulas which Specify Proportional Parts

6. Density and Specific Gravity and Specific Volume

- a. Density and Specific Gravity
- b. Density Versus Specific Gravity
- c. Calculating the Specific Gravity of Liquids
- d. Calculating the Specific Gravity of Solids
- e. Calculating Specific Volume
- f. Use of Specific Gravity in Calculations of Weight and Volume

7. Percentage, Ratio Strength, and Other Expressions of Concentration

- a. Percentage Preparations
- b. Percent Weight-in-Volume
- c. Percent Volume-in-Volume
- d. Percent Weight-in-Weight
- e. Ratio Strength
- f. Milligrams Percent
- g. Parts per Million (PPM) and Parts per Billion (PPB)

8. Dilution and Concentration

- a. Relationship Between Strength and Total Quantity
- b. Dilution and Concentration of Liquids
- c. Stock Solutions
- d. Dilution of Alcohol
- e. Dilution of Acids
- f. Dilution and Concentration of Solids
- g. Alligation
- h. Specific Gravity of Mixtures

9. Some Calculations in Contemporary Compounding

- a. Use of Prefabricated Dosage Forms in Compounding
- b. Pharmaceutical Formulas

10. Calculations Involving Veterinary Pharmaceuticals

- a. Considerations in Compounding Veterinary Pharmaceuticals

11. Calculations Involving “Units”, “ $\mu\text{g}/\text{mg}$ ” and Other Measures of Potency

12. The Common Systems and Inter-system Conversion

- a. Apothecaries' Fluid and Weight Measure
- b. Avoirdupois Measure of Weight
- c. Fundamental Operations and Calculations
- d. Inter-system Conversion

13. Graphical Methods

- a. Linear Relationships on Rectangular Graph Paper
- b. Linear Relationships on Semilogarithmic Graph Paper
- c. Other Methods of Data Presentation: Tables and Charts

Lecture/Examination Schedule

Week	Date	Day	Time	Topics	Instructor
1	8/27/20	Thur	8:00-9:00am	Introduction to the Course	Dr. Adesina
			9:00-9:50am	Abbreviations, Medication Errors, Interpretation of Prescriptions	Dr. Adesina
2	09/03/20	Thur	8:00-8:50am	Abbreviations, Medication Errors, Interpretation of Prescriptions	Dr. Adesina
			9:00-9:50am	Ratio and Proportion	Dr. Pather
3	09/10/20	Thur	8:00-9:00am	The International System of Units	Dr. Pather
			9:00-9:50am	Estimation Methods	Dr. Pather
4	09/17/20	Thur	8:00-8:50am	Reducing/Enlarging Formulas	Dr. Pather
			9:00-9:50am	Calculation of Doses	Dr. Adesina
5	9/24/20	Thur	8:00-9:00am	Calculation of Doses	Dr. Adesina
			9:00-9:50am	Calculation of Doses	Dr. Adesina
6	09.25.20	Fri	11:00-12:30pm	Examination 1 (Weeks 1 - 4)	Adesina/Pather
	10/01/20	Thur	8:00-9:00am	Density and Specific Gravity	Dr. Adesina
			9:00-9:50am	Density and Specific Gravity	Dr. Adesina
7	10/08/20	Thur	8:00-9:00am	Percentage and Ratio Strength	Dr. Adesina
			9:00-9:50am	Percentage and Ratio Strength	Dr. Adesina
8	10/15/20	Thur	8:00-8:50am	Percentage and Ratio Strength	Dr. Adesina
			9:00-9:50am	Altering Product Strength	Dr. Habib
9	10/22/20	Thur	8:00-9:00am	Altering Product Strength	Dr. Habib
			9:00-9:50am	Altering Product Strength	Dr. Habib
	10.23.20	Fri	11:00-12:30pm	Examination 2 (Weeks 5 – 8)	Adesina/Habib
10	10/29/20	Thur	8:00-9:00am	Problem Solving by Alligation	Dr. Habib
			9:00-9:50am	Problem Solving by Alligation	Dr. Habib
11	11/05/20	Thur	8:00-8:50am	Problem Solving by Alligation	Dr. Habib
			9:00-9:50am	Calculations of veterinary pharmacy	Dr. Akala
12	11/12/20	Thur	8:00-8:50am	Common System & Intersystem Conversion	Dr. Akala
			9:00-9:50am	Calculations involving “Units”, “ $\mu\text{g}/\text{mg}$ ” and other measures of potency	Dr. Akala
13	11/19/20	Thur	8:00-9:00am	Graphical methods, Exponential and Logarithmic Notations.	Dr. Akala
			9:00-9:50am	Graphical methods, Exponential and Logarithmic Notations.	Dr. Akala
	11.20.20	Fri	11:00-12:30pm	Examination 3 (Weeks 9 – 13)	Habib/Akala
December 2-11, 2020				Final Exams	TBA

**Howard University
College of Pharmacy
Department of Pharmaceutical Sciences**

Pharmaceutical Calculations II Course Plan

Title: Pharmaceutical Calculations II

Course #: PHSC 313 01

Credit Hour: 2 credits

Sequence: Spring semester

Effective Date: 01.11.2021

Course Schedule: Monday 1:40pm – 2:30pm
Friday 10:40am – 11:30am

Course Coordinator: Simeon K. Adesina R.Ph., Ph.D.

Contact Information: Room #304, College of Pharmacy
Phone: 202-250-5304
Email: simeon.adesina@howard.edu

Office hours: Dr. Adesina: Wednesdays 11 am – 1 pm or by appointment

Location: Remote/Online

Email: simeon.adesina@howard.edu

Year: P1

Instructors: Dr. Simeon K. Adesina (simeon.adesina@howard.edu)
Dr. Indiran Pather (indiran.pather@howard.edu)
Dr. Pradeep Karla (pkarla@howard.edu)
Dr. Emmanuel Akala (eakala@howard.edu)
Dr. Oluwatoyin Adeleke (TBD)

Prerequisites (if any): None

Online Course Site: Blackboard.howard.edu

Required Textbook: Pharmaceutical Calculations, 15th Edition, Howard C. Ansel & Shelly J. Stockton.

Required Technologies/Websites:

- Blackboard: <http://blackboard.howard.edu>
- ECHO 360: via Blackboard website
- HU COP: <http://www.pharmacy.howard.edu> for AccessPharmacy®, ExamSoft®
- Zoom

Course Delivery

The College of Pharmacy has adopted the HyFlex model for our courses. However, due to the resurgence of COVID-19 in the District of Columbia and other states, this course currently will be delivered fully via online using Zoom/ECHO 360 live streaming. Adjunct faculty may use zoom for their lectures. Students will not be allowed to come to College for face to face classroom learning at this time. All assignments, quizzes and exams will be online via ExamSoft. Remote proctoring will be via Exam Monitor in ExamSoft.

Course Description: This course is an introductory development course. Quantitative skills necessary for an understanding of the basic and clinical pharmaceutical sciences, will be explored. Various techniques necessary in pharmaceutical calculations employed by the pharmacist in different practice areas will be discussed.

Course Objectives: This course will provide the student with the knowledge base necessary to:

1. Perform calculations to accurately prepare prescription and medication orders.
2. Calculate the dose of medications using one of a variety of methods.
3. Demonstrate proper use of graphical methods commonly used in medical literature.
4. Accurately perform calculations which involve the use of common or natural logarithms.

HUCOP Curricular Outcomes and Learning Objectives

The Howard University College of Pharmacy is committed to assuring that its Doctor of Pharmacy graduates achieve competence in the ability-based outcome areas set forth by the Accreditation Council of Pharmacy Education (ACPE) and the Center for the Advancement of Pharmaceutical Education (CAPE) Educational Outcomes. These learning outcomes provide an organizing structure around which to frame discussions of curriculum design, restructuring, implementation, and assessment. In addition, a well-designed curriculum built around these ability-based outcomes helps to ensure the student's transitional growth across the curriculum resulting in professional competency and the ability to provide excellent patient care upon entry into practice.

This document identifies fifteen program-level ability-based outcomes and their related learning objectives. Proficiency in these fifteen outcomes will ensure general educational competency as well as professional competency in the core domains of Foundational Knowledge, Essentials for Practice and Care, Approach to Practice and Care, and Personal and Professional Development.

DOMAIN 1: FOUNDATIONAL KNOWLEDGE

Outcome 1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., *pharmaceutical, social/behavioral/administrative, and clinical sciences*) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and *patient centered care*.

Learning Objectives

1.1.6. Perform error-free mathematical calculations with regard to drug dosing, pharmacokinetics, and compounding dosage forms

DOMAIN 2: ESSENTIALS FOR PRACTICE AND CARE

Outcome 2.1. Patient-centered care (Caregiver) - Provide *patient-centered care* as the medication expert (collect and interpret evidence, prioritize, formulate assessments and recommendations, implement, monitor and adjust plans, and document activities).

Learning Objectives

2.1.7. Select the proper drug, dose, and dosage form for a specific patient.

DOMAIN 3: APPROACH TO PRACTICE AND CARE

Outcome 3.1. Problem Solving (Problem Solver) – Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.

Learning Objectives

3.1.1. Demonstrate reasoned and reflective consideration of evidence in a particular context to make a judgment.

3.1.2. Apply critical thinking skills, including identification, investigation, application, analysis, creativity, synthesis and evaluation, to clinical or other professional problem-solving and decision making.

Course Learning Objectives (EPAs):

In order to achieve the above-mentioned learning outcomes, this course will cover the following learning objectives based upon the Entrustable Professional Activities for New Pharmacy Graduates (EPAs):

Domain 1: Patient Provider

Core Statement/Learning Objective 1: Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.

Domain 3: Population Health Promoter

Core Statement/Learning Objective 2: Minimize adverse drug events and medication errors.

Domain 5: Practice Manager

Core Statement/Learning Objective 3: Fulfill a medication order.

Instruction/Methodology/Activities:

The instructional activities will be primarily lecture based. The lectures are intended to enable the application of knowledge and understanding. There will be problem solving sessions in the class with active student participation throughout the course. Students will have opportunities to solve problems in the class and to demonstrate solutions to the entire class. Lecture styles may vary among the instructors. It is assumed and expected that students are familiar with basic arithmetic calculations before entering this class.

Class Participation: Students are expected to attend and participate in all activities and are held responsible for missed material.

Assessments: Final computation of course grades will be based on the following:

- a. Three semester examinations.....20% each = 60%
- b. Final Comprehensive Examination = 30%
- c. Attendance = 5%
- d. Quizzes and/or Assignments = 5%

Examinations and quizzes during the semester shall be based on materials covered during a specified period and are NOT comprehensive to the date of the exam. The final examination WILL BE comprehensive and based on all materials covered throughout the semester. Attendance grade will be given based on 100% attendance or excused absences as determined by the coordinator. Fractional grades for attendance will not be given.

Grades:

Numerical equivalents of letter grades shall be as follows:

- 89.5-100% = A
- 85.5-89.4% = B+
- 79.5-85.4% = B
- 75.5-79.4% = C+
- 69.5-75.4% = C
- 69.4% and below = F

Policies on Examinations, Grades, Class Attendance, and Dress Code

1. The College/University policies concerning student Conduct and Cheating during examinations described in the **COP Student Handbook/Manual** and the Howard University By-Laws on Student Code of Conduct and Judiciaries described in the **H-Book** shall apply to this course. In addition, NO personal calculators shall be allowed in the exams. The calculator in Examsoft will be enabled for use in this class. A student who violates this policy will receive a grade of “zero” on that exam.
2. All scheduled exams shall be based on materials covered since the last exam as described in the Lectures/Exams Schedule and shall be announced before each examination. The final examination shall be comprehensive, i.e., it shall cover all the materials presented in the course.

3. The exam schedule appears in the Lectures/Exams Schedule as outlined. However, the class, through its President, may request changing any or all of the scheduled examinations because of conflict with other courses **only within the first ten (10) working days** of the semester. The course coordinator shall attempt to accommodate this request while taking into account the need to include in each examination a reasonable amount of course material. After distributing the final revision, no change in the examination schedule shall be permitted except under unforeseen circumstances determined by the Course Coordinator.
4. Students have the responsibility to take all scheduled examinations on the announced date and time. To insure fairness in the conduct of examinations, no tardy student shall be allowed to take the examination after any other student has completed the exams. A student who logs in to the examination late shall not be given any extra time.
5. A student who fails to appear and take the exam on its scheduled date and time, shall earn the grade of "zero" unless his/her absence is considered "excused."
6. Students may review and compare their answers with the exam key during the specific times announced by the instructor and requests for grade changes will be considered only during this time. This will be announced to the class.

Policy Regarding Excused Absences in Examinations:

Procedures for absences in an examination for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP Excused Absence Policy for the semester.

Calling the Instructor or the Course Coordinator on or before the exam is desirable, it does not constitute a permission to miss the exam

Class Attendance Restricted to Registered Students

Only students whose names appear on the official course roster are permitted to attend class meetings. Students who are not registered are not permitted to attend or participate in course activities, do not have access to Blackboard, cannot submit course assignments, and will not receive a grade for this course. It is the students' responsibility to ensure that they are properly registered by the published registration deadline. Requests to add courses after the deadline will not be considered.

Class Attendance:

1. No non-registered student is authorized or permitted to continue in any course offered by the Department of Pharmaceutical Sciences beyond the final day for registration. No exceptions will be made.
2. A non-registered student will be interpreted by the instructor of the course as a student whose name does not appear on the official class list provided by the Registrar's Office after the final day of registration.
3. All students registered for a course are expected to show up for class ON TIME and to attend all classes. Students missing class for any reason are responsible for the material missed and may not earn attendance points for grade purposes.

Dress Code

The college policy concerning Dress Code as described in the COP Student Handbook/Manual shall apply to this course

Non-registered Students

A non-registered student is not authorized or permitted to continue in the course past the final day for registration. No exceptions are permitted. No one will be allowed to remain in the class or participate in any class activity. If you have registered for the course and paid your fees but your name is not on the class roll, you may show the instructor an official University paid receipt for the course to remain temporarily in class while you follow University procedure to be placed on the University Official class roster as quickly as possible. Registration printout is not acceptable.

American Disability Act Statement

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students in need of accommodations due to a disability should contact the office of the Dean for Special Services for verification and determination of reasonable accommodations as soon as possible after admission to the University, or at the beginning of each semester. The Dean of Special Services, Dr. Elaine Heath, can be reached at (202) 238-2420. Please note that all medical documentation must be submitted to Special Services within the first two weeks of class. Consideration for exam scheduling and testing time, remediation etc, because of medical reasons, will be determined based on the receipt of academic accommodations from the Special Services at the beginning of the semester. There will be no consideration after a semester grade, or the final grade has been calculated.

Process for Requesting Reasonable Accommodations

Student must submit by email to oss.disabilityservices@howard.edu the below listed items

- a. Completed *Student Request for Accommodations form**
- b. Signed *Rights and Responsibilities Form**
- c. Supporting documentation as appropriate to disability e.g. medical, chronic illness, psychological, learning disability etc
- d. 504 Plan or IEP Plan (optional) may be used as supporting evidence but may not contain enough information to support the request for accommodations.

**Forms are available on the online at <https://studentaffairs.howard.edu/diversity-inclusion/accommodations-requests>, or may be requested by calling 202-238-2420 or emailing oss.disabilityservices@howard.edu*

Please see the Howard University Student Handbook for more information on the process.

Online Course Site: Blackboard.howard.edu

This course will utilize blackboard.com, a web-based site that will facilitate much of the class activities. All registered students must gain access to the course site on the web and utilize it accordingly. Updates announcements of pertinent class material changes, quiz and practicum dates, grades, specific assignments, etc., will be posted on the site. Access the site at blackboard.howard.edu on your web browser. Log in by entering your user ID (use your banner ID without the @ sign) and password (use your banner password). Please update your email address by updating your personal information on your home page. You will not be able to receive pertinent emails and assignments if your email address is incorrect.

“Writing Matters” – Writing Across the Curriculum (WAC)

“Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatical, and consistent with the conventions of the field. If your writing does not meet these standards, points may be deducted, or you may be asked to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.”

Policy regarding course withdrawal

Course withdrawal dates can be found in the University calendar. Please follow the posted deadlines.

Exam Software Policy

Examsoft® software will be used for all examinations. It is your responsibility to make sure that you have a working laptop computer equipped with a webcam. Make sure your laptop computer is fully working and charged. Exams should be downloaded prior to the exam as specified by the instructor. The exams can be composed of multiple choice, fill-in and/or short answer/essay or any other format as determined by the coordinator. If the exam is done remotely, then the online remote exam taking policy will apply. Students must activate and/or enable Exam ID and Exam Monitor for all assessments in this course.

Exam Review Policy

For exams taken remotely, the grades will be released via Blackboard once the exam monitor feedback is received. Students may schedule a one-on-one review of the examinations with the coordinator during the office hours or by appointment via zoom. There will be no examination review for the final examination. Students may be directed to instructors who taught specific sections of the course if the exam cannot be satisfactorily reviewed by the course coordinator. Duplication of exam questions via writing, electronic or other means will be considered an act of academic dishonesty.

Exam Questions

During an ongoing exam, no explanations/clarifications on any question will be given. Any issues about potential incorrect/wrong exam questions must be addressed with the

course coordinator within 24 hours after the exam. If the topic was not taught by the course coordinator, the instructor will be contacted. It is the coordinator's decision to determine the appropriateness/fairness of exam questions and to determine whether further credit should be awarded.

Cheating in the Examinations:

All examinations shall be proctored by ExamMonitor software to prevent and discourage cheating. If cheating is suspected/determined, Examsoft will send a video footage of the cheating, this will be verified by the course instructors and will be handled in accordance with procedures set forth in the Howard University Academic Code of Conduct. Students should read the "Academic Code of Conduct" that is published in the H-Book and the Student Reference Manual and Directory of Classes. The "Academic Code of Conduct" is available at www.provost.howard.edu. It is expected Pharmacy students are professional students and the highest level of integrity is expected.

Policy regarding Remediation:

Remediation proceedings for this course will follow the Howard University College of Pharmacy (HUCOP) approved policy posted in the student handbook. Please refer to the current HUCOP remediation policy for the semester.

Course Evaluation:

Each student will be provided an opportunity to evaluate the course via an online link provided by the College of Pharmacy prior to the final examination. This evaluation is anonymous. Faculty are not present for this evaluation.

Outline of Topics

1. Body Mass Index and Nutrition Label

2. Ionization and drug absorption

- a. Percent ionization
- b. Use of Percent Ionization

3. Serum Chemistry/Clinical Laboratory Calculations

- a. Calculations involving clinical laboratory tests

4. Calculation of Doses (Review)

5. Body Weight Considerations

- a. Actual body weight
- b. Ideal body weight
- c. Adjusted body weight

6. Electrolyte Solutions: Milliequivalents, Millimoles and Milliosmoles

- a. Milliequivalents
- b. Millimoles
- c. Osmolarity

7. Constituted Solutions, Intravenous Admixtures and Rate of Flow

- a. Constitution of Dry Powders
- b. Intravenous Infusion & Admixtures
- c. Parenteral Nutrition
- d. Rate of Flow of Intravenous Fluids
- e. Hyperalimentation Solutions
- f. Insulin and Heparin Calculations
- g. Constituted Solutions/Total Parenteral Nutrition

8. Pharmacokinetic Dosing Calculations

- a. Define bioavailability and pharmacokinetics
- b. Interpret a serum concentration vs time plot
- c. Basic bioavailability and bioequivalence calculations
- d. Basic calculations involving volume of distribution, clearance and elimination half-life.

Lecture/Examination Schedule

Date	Day	Time	Topics	Instructor
01/11/21	Mon	1:40 - 2:30pm	Review of Course Syllabus	Adesina
01/15/21	Fri	10:40 - 11:30am	Calculation of Doses Review	Adesina
01/18/21	Mon		UNIVERSITY CLOSED - Martin Luther King, Jr.'s Birthday Observed	
01/22/21	Fri	10:40 - 11:30am	Calculation of Doses Review	Adesina
01/25/21	Mon	1:40 - 2:30pm	Body Mass Index and Nutrition Label	Akala
01/29/21	Fri	10:40 - 11:30am	Body Mass Index and Nutrition Label	Akala
02/01/21	Mon	1:40 - 2:30pm	Ionization and Drug Absorption	Akala
02/05/21	Fri	10:40 - 11:30am	Ionization and Drug Absorption	Akala
02/08/21	Mon	1:40 - 2:30pm	Serum Chemistry/Clinical Laboratory Calculations	Adeleke
02/12/21	Fri	10:40 - 11:30am	Electrolyte Solutions	Karla
02/15/21	Mon		UNIVERSITY CLOSED - Presidents Day Observed	
02/19/21	Fri	10:40 - 11:30am	Electrolyte Solutions	Karla
02/22/21	Mon	1:40 - 2:30pm	Intravenous Infusion	Adeleke
02/24/21	Wed	1:30 - 3:00pm	Exam #1 (01.15.21 - 02.19.21)	
02/26/21	Fri	10:40 - 11:30am	Intravenous Infusion	Adeleke
03/01/21	Mon	1:40 - 2:30pm	IV Admixtures	Karla
03/05/21	Fri		Charter Day Convocation – CLASSES SUSPENDED	
03/08/21	Mon	1:40 - 2:30pm	Spring Recess	
03/12/21	Fri	10:40 - 11:30am	Spring Recess	
03/15/21	Mon	1:40 - 2:30pm	Constituted Solutions, TPN	Karla
03/19/21	Fri	10:40 - 11:30am	Constituted Solutions, TPN	Karla
03/22/21	Mon	1:40 - 2:30pm	Insulin Calculations	Karla
03/26/21	Fri	10:40 - 11:30am	Pharmacokinetic Dosing Calculations	Pather
03/29/21	Mon	8:00 – 9:30 am	Exam #2 (02.22.21 – 03.22.21)	
03/29/21	Mon	1:40 - 2:30pm	Pharmacokinetic Dosing Calculations	Pather
04/02/21	Fri	10:40 - 11:30am	Pharmacokinetic Dosing Calculations	Pather
04/05/21	Mon	1:40 - 2:30pm	Pharmacokinetic Dosing Calculations	Pather
04/09/21	Fri	10:40 - 11:30am	Hyperalimentation Solutions	Adeleke
04/12/21	Mon	1:40 - 2:30pm	Heparin calculations	Karla
04/16/21	Fri	10:40 - 11:30am	Rate of Flow Calculations Last Day to Withdraw from a Course	Karla
04/19/21	Mon	1:40 - 2:30pm	Rate of Flow Calculations	Karla
04/21/21	Wed	1:30 – 3:00pm	Exam #3 (03.26.21 – 04.19.21)	
04/23/21	Fri	10:40 - 11:30am	Body Weight Considerations	Adeleke
April 23-25			READING PERIOD	
April 28 – May 4, 2021		Final Exams		Refer to College of Pharmacy Final Exam Schedule