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PHP300: Practical Calculations for the Pharmacist

Course Coordinator(s): Patrick S. Kelly, PharmD (coordinator)
Credit Hours: 1
Course Day(s)/Time(s): Asynchronous, J-Term, 1/2/26-1/16/26
Course Location(s): Brightspace
Office Location(s): Dr. Kelly – Avedisian Hall, Room 295C
Email(s): Dr. Kelly – pkelly@uri.edu
Phone: Dr. Kelly – (401)-874-4027
Office Hours: by appointment via Starfish

COURSE DESCRIPTION: This course provides training on performing pharmaceutical calculations in both outpatient and inpatient settings for students anticipating to start Advanced Pharmacy Placement Experience (APPE) rotations. This course will review techniques for performing clinical and practice-based calculations as one would encounter in professional practice. This course will also review best practices to recognize and prevent calculation errors.

PREREQUISITES: Successful completion of PHC 515 and current enrollment in the PharmD program as a P3 or P4 student OR permission of the course coordinator.

COURSE LEARNING OBJECTIVES
By the end of this course, participants will be able to:

1. Distinguish common units of measure utilized in pharmacy practice
2. Demonstrate the ability to accurately formulate solutions for common outpatient-based clinical calculations involving weight based dosing, pediatric dosing, non-sterile compound preparation, alligations, vaccination preparation, and prescription fulfillment.
3. Demonstrate the ability to accurately formulate solutions for common inpatient-based clinical calculations involving sterile compound preparation, drip rates, dose conversions, body surface area dosing, and therapeutic drug monitoring dose adjustments.
4. Identify best practices for completing pharmaceutical calculations and recognize common errors

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REQUIRED TEXTS:

Nesamony, J. *The APhA Complete Review for Pharmacy Math*. American Pharmacists Association; 2020.
This text is available to all PharmD students at URI through Pharmacy Library at URL: https://pharmacylibrary.com/doi/book/10.21019/9781582122861 or through URI Drug Information Services at: https://web.uri.edu/druginfo/drug-information-medical-references/ then "APhA Pharmacy Library".

STUDENT PERFORMANCE REQUIREMENTS: This course is run during J-Term from 1/2/26 – 1/16/26 in an asynchronous fashion utilizing Brightspace. Since this is offered during the J-Term, the pacing is accelerated compared to traditional semesterly or summer offerings. The amount of time spent each week for this course equates to roughly 6 hours per week but may vary based upon your academic background or professional practice experience as an intern. Specific assignments are outlined on the schedule below. It is expected that all students log onto the course ***daily*** and complete the required task whether it be an assignment, discussion post, or other deliverable. ***Assignments will have due dates daily by 11:59PM***. A failure to complete all required work, irrespective of grade average, will result an Incomplete as a final grade.

MAJOR STUDY UNITS:
Week 1: Module 1, Units of Measure & Conversions
Week 2: Module 2, Community Practice & Module 3, Institutional Practice
Week 3: Module 4, Safety and Errors, Module 5, Student DIY Case

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METHODS OF EVALUATION

Student Deliverables	Module	Weight	CLO

• Discussion Boards
  ○ Introduction Post
  ○ Safety and Errors Post
	1, 2, 3, 4	50 points each	1, 2, 3, 4

• Reflections ○ End of Class Reflection	2, 3, 4	50 points each	1, 2, 3, 4

• Clinical Cases
  ○ Units of Measure/Dose Conversions
  ○ #1 Weight Based Dosing
  ○ #2 Days Supply/Order Fulfillment
  ○ #3 Alligations & Non-Sterile Preparations
  ○ #4 Injectables (Insulin/Vaccines)
  ○ #5 Infusion & Drip Rates
  ○ #6 BSA calculations
  ○ #7 Sterile Preparations
  ○ #8 Therapeutic Drug Monitoring Adjustments
  ○ #9 Calculation Errors
	1, 2, 3, 4	50 points each	1, 2, 3

• Quiz #1– Community (Retail) Competency	3	50 points	1,2
• Quiz #2 – Institutional (Inpatient) Competency	4	50 points	1,3
• Quiz #3 – Safety and Errors Competency	4	50 points	1,4
• Student DIY Clinical Case	5	200 points	1, 2, 3, 4

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DESCRIPTIONS OF ASSIGNMENTS

- Discussion Boards: For these assignments the student will read the relevant prompt and post a discussion thread and respond to classmate threads through Brightspace as directed.
- Reflections: This assignment will be assigned towards the latter part of the session and will ask students to opine and thoughtfully respond to an article, prompt, or other clinical matter surrounding pharmaceutical calculations. This will be submitted via the Assignments tab on Brightspace.
- Clinical Cases: For these assignments the student will read through the clinical case for the specified topic. The student will apply the concepts from the corresponding module or book chapter to answer the questions posed. The assignment will be submitted through the Assignments tab on Brightspace
- Quizzes: There are three quizzes administered for this course; one at the conclusion of the Community (Retail) module, one at the conclusion of the Institutional (Inpatient) module, and another at the conclusion of the Safety/Errors Module. These are independent activities and the student will access the quiz through the Quizzes tab on Brightspace. These quizzes will cover all material from the relevant module and will assess basic competency in the topic.
- Student DIY Clinical Case: At the conclusion of the course, each student will be asked to create their own Clinical Case ("Student DIY Case") and post it to Brightspace for their classmates to review, complete, and provide feedback. Each student will also post a subsequent Tutorial for how to complete the case for their peers to review. This tutorial can be done in a written fashion or through audio/video media.

GRADE POINT SYSTEM

A = 93%-100%	B = 83%-86%	C = 73%-76%	D = 63%-66%
A- = 90%-92%	B- = 80%-82%	C- = 70%-72%	F=62% and below
B+ = 87%-89%	C+ = 77%-79%	D+ = 67%-69%	

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Week	Topics Discussed	Course Learning Objectives	Assignments/Deliverables
1	• Units of Measure/Dose Conversions	1	• Introduction Discussion Post, Practice Problems
2	• Retail Calculations (weight based dosing, order fulfillment, alligations, non-sterile compounding, injectables, vaccines) • Institutional (Inpatient) Calculations (IV drip rates, BSA, sterile compounding, therapeutic drug monitoring)	1,2,3	• Clinical Cases #1-4, Community (Retail) Competency Quiz • Clinical Cases #5-8, Institutional (Inpatient) Competency Quiz
3	• Safety and Errors • DIY Student Case	1,2, 3, 4	• Clinical Case #9 Safety/Errors Discussion Post, Safety/Errors Competency Quiz • Student DIY Case, Student DIY Case Tutorial, End of Class Reflection

ESSENTIAL EQUIPMENT:
To successfully complete this course, you will need access to a computer with reliable, high-speed Internet access and appropriate system and software to support the Brightspace learning platform. Typical technical requirements for users are:

Windows 7 (XP or Vista) 64 MB Ram 28.8 kbps modem (56k or higher recommended) SoundCard & Speakers External headphones with built-in	Mac OS X or higher 32 MB Ram 28.8 kbps modem (56k or higher recommended) SoundCard & Speakers External headphones with built-in

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microphone Mozilla Firefox 9.0 or higher	microphone Mozilla Firefox 9.0 or higher; Safari 5.0 or higher

Also requires Word 2007 (PC) 2011 (MAC) or newer, PowerPoint, Excel, Adobe Flash, and Adobe Acrobat Reader.

TECHNOLOGY REQUIREMENTS & RESOURCES

The course is delivered through the Brightspace Learning Management System (LMS), Panopto, Zoom and Google Drive platform, which are a set of web applications designed to work with modern web browsers. Recommended browsers (those with the most QA testing effort against them) are Google Chrome, Safari, and Mozilla Firefox. The mobile versions of these browsers also work well with the majority of operations in Brightspace. Internet Explorer is not recommended.

To successfully complete this course, you will also need a working knowledge of Brightspace, Panopto, Zoom and Google Drive. For help attaining these skills please refer to the tutorial links below.

- **Brightspace**
  - Account Access https://brightspace.uri.edu
  - Resource page https://web.uri.edu/brightspace/
  - Tutorials https://www.youtube.com/playlist?list=PLZz77ffBC33ltZ_XzSgohYHpzlo6T2xiE
  - Accessibility Information https://www.d2l.com/accessibility/standards
- **Panopto**
  - Account Access https://uri.hosted.panopto.com/
  - Tutorials https://its.uri.edu/services/9465203c49d0333596ae054e4b88af60bd08d0e280/#training
  - Accessibility Information https://support.panopto.com/s/article/Learn-About-Accessibility-Features
- **Zoom**
  - Account Access https://uri-edu.zoom.us/
  - Tutorials https://youtube.com/playlist?list=PLZz77ffBC33kRvShf_m2hdmoeLShm-Ewf
  - Accessibility Information https://zoom.us/accessibility

- **Google Drive**
  - Account Access https://drive.google.com/
  - Tutorials https://support.google.com/
  - Accessibility Information https://support.google.com/drive/topic/2650510?hl=en&ref_topic=14940

CLASSROOM PROTOCOL

For this online course, Brightspace is our "classroom." Please refer to the Brightspace YouTube video tutorials before you get started and refer back to them as a resource as needed while you complete this course.

In the online learning environment, "attendance" is measured by your PRESENCE in the site as well as your CONTRIBUTIONS to the site. The importance of regular log-ins and active participation cannot be overstated. Regular online attendance/participation and engagement is expected for student success and is evident through timely postings and submissions, as well as any other required activities and assignments. All activities and/or assignments will be due **daily at 11:59PM as stated on Brightspace and the course schedule.**

ATTENDANCE AND OTHER CLASS POLICIES

Requirements for students' attendance and participation will be defined by each instructor based on the following policy:

- Please see the course schedule for specific due days.
- Regular online attendance/participation and engagement is expected for student success in fully online courses. Online participation is evident through posting to a discussion board, completing real-time activities or quizzes, or other course-related activities.
- Deadlines for deliverables are 11:59pm of the stated date.

NETIQUETTE FOR ONLINE COURSE

- Be polite and respectful of one another.
- Avoid personal attacks. Keep dialogue friendly and supportive, even when you disagree or wish to present a controversial idea or response.
- Be careful with the use of humor and sarcasm. Emotion is difficult to sense through text.

- Be helpful and share your expertise. Foster community communication and collaboration.
- Contribute constructively and completely to each discussion. Avoid short repetitive “I agree” responses and don’t make everyone else do the work.
- Consider carefully what you write. Re-read all e-mail and discussion before sending or posting.
- Remember that e-mail is considered a permanent record that may be forwarded to others.
- Be brief and succinct. Don’t use up other people’s time or bandwidth.
- Use descriptive subject headings for each e-mail message.
- Respect privacy. Don’t forward a personal message without permission.
- Cite references. Include web addresses, authors, names of articles, date of publication, etc.
- Keep responses professional and educational. Do not advertise or send chain letters.
- Do not send large attachments unless you have been requested to do so or have permission from all parties.
- 2 word postings (e.g.: I agree, Oh yeah, No way, Me too) do not “count” as postings.

URI ACADEMIC WRITING STANDARDS

Specific writing standards differ from discipline to discipline, and learning to write persuasively in any genre is a complex process, both individual and social, that takes place over time with continued practice and guidance. Nonetheless, URI has identified some common assumptions and practices that apply to most academic writing done at the university level. These generally understood elements are articulated here to help students see how they can best express their ideas effectively, regardless of their discipline or any particular writing assignment.

Venues for writing include the widespread use of e-mail, electronic chat spaces and interactive blackboards. URI is committed to guaranteeing that students can expect all electronic communication to meet Federal and State regulations concerning harassment or other “hate” speech. Individual integrity and social decency require common courtesies and a mutual understanding that writing--in all its educational configurations--is an attempt to share information, knowledge, opinions and insights in fruitful ways.

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Academic writing (as commonly understood in the university) always aims at correct Standard English grammar, punctuation, and spelling.

The following details are meant to give students accurate, useful, and practical assistance for writing across the curriculum of URI.

Students can assume that successful collegiate writing will generally:

- Delineate the relationships among writer, purpose and audience by means of a clear focus (thesis statements, hypotheses or instructor-posed questions are examples of such focusing methods, but are by no means the only ones) and a topic that's managed and developed appropriately for the specific task.
- Display a familiarity with and understanding of the particular discourse styles of the discipline and/or particular assignment.
- Demonstrate the analytical skills of the writer rather than just repeating what others have said by summarizing or paraphrasing
- Substantiate abstractions, judgments, and assertions with evidence specifically applicable for the occasion whether illustrations, quotations, or relevant data.
- Draw upon contextualized research whenever necessary, properly acknowledging the explicit work or intellectual property of others.
- Require more than one carefully proofread and documented draft, typed or computer printed unless otherwise specified.

PROFESSIONAL CONDUCT

Cheating and plagiarism are serious academic offenses, which are deal with firmly by the College and University. Scholastic integrity presumes that students are honest in all academic work. **Cheating** is the failure to give credit for work not done independently (i.e., submitting a paper written by someone other than yourself), unauthorized communication during an examination, or the claiming of credit for work not done (i.e., falsifying information). **Plagiarism** is the failure to give credit for another person's written or oral statement, thereby falsely presuming that such work is originally and solely your own.

If you have any doubt about what constitutes plagiarism, visit the following website: https://honorcouncil.georgetown.edu/whatisplagiarism, the URI Student Handbook, and University Manual sections on plagiarism and cheating at http://web.uri.edu/studentconduct/student-handbook/.

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Students are expected to be honest in all academic work. A student's name on any written work, quiz or exam shall be regarded as assurance that the work is the result of the student's own independent thought and study. Work should be stated in the student's own words, properly attributed to its source. Students have an obligation to know how to quote, paraphrase, summarize, cite and reference the work of others with integrity. The following are examples of academic dishonesty.

- Using material, directly or paraphrasing, from published sources (print or electronic) without appropriate citation;
- Claiming disproportionate credit for work not done independently;
- Unauthorized possession or access to exams;
- Unauthorized communication during exams;
- Unauthorized use of another's work or preparing work for another student;
- Taking an exam for another student;
- Altering or attempting to alter grades;
- The use of notes or electronic devices to gain an unauthorized advantage during exams;
- Fabricating or falsifying facts, data or references;
- Facilitating or aiding another's academic dishonesty;
- Submitting the same paper for more than one course without prior approval from the Instructor.

Please note the following section from the University Manual:

> **8.27.17.** Instructors shall have the explicit duty to take action in known cases of cheating or plagiarism. The instructor shall have the right to fail a student on the assignment on which the instructor has determined that a student has cheated or plagiarized. The circumstances of this failure shall be reported to the student's academic dean, the instructor's dean, and the Office of Student Life. The student may appeal the matter to the instructor's dean, and the decision by the dean shall be expeditious and final.
>
> Such action will be initiated by the instructor if it is determined that any written assignment is copied or falsified or inappropriately referenced.

Any good writer's handbook as well as reputable online resources will offer help on matters of plagiarism and instruct you on how to acknowledge source material. If you need more help understanding when to cite something or how to indicate your references, PLEASE ASK.

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Please note: Students are responsible for being familiar with and adhering to the published **"Community Standards of Behavior: University Policies and Regulations"** which can be accessed in the **University Student Handbook.**

STUDENT SUPPORT SERVICES

The following student support services are provided by the university and available to all URI students:

- Student support services such as counseling center: https://web.uri.edu/counseling
- Food assistance: https://web.uri.edu/rhody-outpost
- Bias resource team: https://web.uri.edu/brt

ACADEMIC SUPPORT SERVICES

Disability, Access, and Inclusion

Americans With Disabilities Act Statement

Any personal learning accommodations that may be needed by a student covered by the "Americans with Disabilities Act" must be made known to the university as soon as possible. This is the student's responsibility. Information about services, academic modifications and documentation requirements can be obtained from The Office of Equal Opportunity (OEO). https://web.uri.edu/affirmativeaction/

Any student with a documented disability is welcome to contact me early in the semester so that we may work out reasonable accommodations to support your success in this course. Students should also contact Disability, Access, and Inclusion, Dean of Students Office/Student Affairs, 330 Memorial Union, 401-874-2098. https://web.uri.edu/disability/

From the University Manual: 6.40.10 and 6.40.11 Accommodations for Qualified Students With Disabilities.

Students are expected to notify faculty at the onset of the semester if any special considerations are required in the classroom. If any special considerations are required for examinations, it is expected the student will notify the faculty a week before the examination with the appropriate paperwork.

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BRIGHTSPACE SUPPORT SERVICES

The ITS Service Desk, located in the URI Library, is prepared to help students should they encounter problems with Brightspace. Please read through the following information:

1. For login problems, call the Service Desk at 874-4357.
2. The Service Desk Website, https://web.uri.edu/itservicedesk/ opens in new window, posts the semester operating schedule as well as a link on the right index to the self- help technical wiki. That site contains Brightspace help and instructions for both students and faculty.

Recommended browsers (those with the most QA testing effort against them) are Google Chrome, Safari, and Mozilla Firefox. The mobile versions of these browsers also work well with the majority of operations in Brightspace. Internet Explorer is not recommended.

URI ONLINE LIBRARY RESOURCES

https://web.uri.edu/library/

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Course Schedule

Week	Topics Discussed	CLO	Assignments / Deliverables
1	Module 1 - Units of Measure - Dose Conversions	1	Friday, 1/2 -Introduction Post -Read Ch. 3 & 4 Sunday, 1/4 - Complete Unit of Measure Practice Problems
2	Module 2 - Weight-Based Dosing - Order Fulfillment - Alligations - Non-Sterile Compounding Module 3 - Infusion & Drip Rates - BSA - Sterile Compounding - Therapeutic Drug Monitoring	1, 2, 3	Monday, 1/5 - Read Ch. 7 - Clinical Cases #1 & 2 Tuesday, 1/6 - Read Ch. 5 - Clinical Cases #3 & 4 Wednesday, 1/7 - Retail (Community) Competency Quiz #1 Thursday, 1/8 - Read Ch. 8 - Clinical Cases #5 & 6 Friday, 1/9 - Read Ch. 9 - Clinical Cases #7 & 8 Sunday, 1/11 - Institutional (Inpatient) Competency Quiz
3	Module 4 – Student DIY Case - Safety and Calculation Errors Module 5 – Reflection - Student DIY Case	1, 2, 3, 4	Monday, 1/12 - Read Articles - Safety/Errors Discussion Post - Clinical Case #9 Tuesday, 1/13 - Safety and Errors Competency Quiz Wednesday, 1/14 - Student DIY Case Thursday, 1/15 - Complete Classmate's DIY Case Friday, 1/16 - DIY Tutorial Due & End of Class Reflection

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