Brookes College

Pharmacy Assistant Diploma

Course Curriculum: Pharmaceutical Calculations

Brookes College Pharmacy Assistant Program
Pharmaceutical Calculations
Course Curriculum

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Course Syllabus: Pharmaceutical Calculations

Course Description:

This intensive 4-week course is meticulously designed to equip pharmacy assistants with essential mathematical skills necessary for accurate medication preparation, dosing, and pricing within a pharmacy environment. Through a combination of synchronous and asynchronous online learning, participants will gain proficiency in dosage calculations, compounding techniques, pricing strategies, and inventory control.

Course Duration:

- 80 hours
- 20 hours per week
- 4 weeks
- 10 hours of online synchronous instruction per week
- 10 hours of self-directed learning per week

Course Goals: This course aims to achieve the following objectives:

- Develop a strong foundation in pharmaceutical calculations tailored for pharmacy assistants.
- Enable students to confidently perform dosage calculations, compounding tasks, and accurate pricing.
- Cultivate the ability to interpret prescriptions, convert measurements, and execute calculations effectively.
- Familiarize students with inventory control methodologies, gross profit determination, and dispensing fee calculations.
- Provide insights into specialized scenarios, including parenteral dosing and infusion rate calculations.
- Enhance proficiency in using ratio and proportion techniques for dosage calculations based on weight and body surface area.
- Foster competence in applying mathematical concepts for solution preparation, dilutions, and the interpretation of medication labels.

Course Format:

- Lectures, readings, multimedia materials, and case studies.
- Interactive discussions and group activities to encourage engagement.
- Guest speakers from the healthcare field to provide real-world insights.

- Weekly assignments to apply theoretical knowledge to practical scenarios.

Course Outcomes: By the end of this course, participants will be able to:

- Demonstrate proficiency in pharmaceutical calculations for dosage, compounding, and pricing.
- Accurately interpret prescriptions, convert measurements, and execute fundamental calculations.
- Apply learned calculations to effectively manage inventory, calculate gross profits, and determine dispensing fees.
- Understand the nuances of parenteral dosing, infusion rates, and successfully address unique scenarios.
- Utilize ratio and proportion methodologies for precise dosage calculations based on weight and body surface area.
- Confidently apply mathematical principles to prepare solutions, conduct dilutions, and interpret medication labels.

Textbook: e-texts have Power Point slides, Instructor manual, tests, and test banks to support instructional delivery:

- Title: Pharmacy Calculations
- Edition: 6th Edition
- Authors: Mary F. Powers, David R. Bright
- Publisher: Morton Publishing Company
- ISBN: Print - 9781617318979, eText - 9781617318986
- Copyright**:** 2020

Course Outline:

Week 1: Introduction to Pharmaceutical Calculations

- Understanding Numeral Systems in Pharmacy
- Mastering Addition and Subtraction of Fractions
- Accurate Rounding of Decimals

Week 2: Essential Calculations and Prescription Interpretation

- Effective Application of Ratio and Proportion in Pharmacy Calculations
- Proficient Interpretation of Prescriptions and Conversion of Measurements

- Skillful Dosage Calculations Based on Body Weight

Week 3: Dosage Calculations and Pricing

- Precise Dosage Calculations Based on Body Surface Area
- Mastery of Infusion Rates and Drip Rates Calculation
- Calculations for Days Supply and Billing Compounds
- Determining Usual and Customary Prices

Week 4: Advanced Calculations and Practical Applications

- Adapting Refills for Short-filled Prescriptions
- Implementing Effective Inventory Control Strategies
- Proficient Dilution Techniques
- Skillful Handling of Alligations
- Expertise in Parenteral Nutrition Calculations
- Calculations Involving Percents
- Application of Ratio and Proportion for Solution Preparation
- Skillful Interpretation of Dosage Calculations from Medication Labels

Assessment and Review:

- Participation: 10%
- Weekly Assignments: 40%
- Midterm Assessment: 20%
- Final Assessment: 30%

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Grading Scale:

Percentage Range	Letter Grade	Grade Points	Description
90 – 100	A+	4.0	**Excellent (4)**
85 – 89	A	4.0	
80 – 84	A-	3.7	
77 – 79	B+	3.3	**Proficient (3)**
73 – 76	B	3.0	
70 – 72	B-	2.7	
67 – 69	C+	2.3	**Competent (2)**
63 – 66	C	2	
60 – 62	C-	1.7	
55 – 59	D+	1.3	
50 – 54	**D**	**1.0**	**Developing (1)**
0 – 49	F	0.0	**Not Evident (0)**

Important Dates:

- Midterm Examination: [Date]
- Final Project Presentation: [Date]
- Final Examination: [Date]

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Module Plans: Pharmaceutical Calculations

Course Duration:

- 80 hours
- 20 hours per week
- 4 weeks
- 10 hours of online synchronous instruction per week
- 10 hours of self-directed learning per week

Course Description:

Pharmaceutical Calculations is an intensive 4-week course designed to provide pharmacy assistants with essential mathematical skills. Through a structured curriculum consisting of modules and lessons, students will gain proficiency in various pharmacy calculations, setting the foundation for accurate medication preparation, dosing, pricing, and inventory control in a pharmacy setting. Assessments throughout the course will ensure students' comprehension and readiness for practical applications in a pharmacy environment.

Course Format:

The course is structured with a combination of online synchronous instruction and self-directed learning. It is recommended that each week consists of two sessions, each comprising 5 hours of synchronous instruction, followed by 5 hours of self-directed learning. Adjustments to session duration and content may be needed based on the course requirements and scheduling preferences.

Textbook: e-texts have Power Point slides, Instructor manual, tests, and test banks to support instructional delivery:

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- Edition: 6th Edition
- Authors: Mary F. Powers, David R. Bright
- Publisher: Morton Publishing Company
- ISBN: Print - 9781617318979, eText - 9781617318986
- Copyright: 2020

Module Outlines:

Week 1: Introduction to Pharmaceutical Calculations

Learning Outcomes: By the end of the module, students will be able to:

- Understand the significance of pharmaceutical calculations in pharmacy practice.

- Apply fundamental math skills to pharmacy calculations involving fractions and decimals.

Session 1: The Basics of Pharmaceutical Calculations

Synchronous Instruction (2.5 hours)

Topics:

- Introduction to the course and the importance of accurate calculations.

Activities:

- Participate in a synchronous lecture on the importance of calculations.
- Engage in asynchronous reading on the significance of calculations.

Self-Directed Learning (2.5 hours)

Activities:

- Practice exercises focusing on fractions and decimals.

Assessment:

- Complete a quiz assessing your understanding of calculation importance.

Session 2: Applying Fractions and Decimals

Synchronous Instruction (2.5 hours)

Topics:

- Understanding numerals, fractions, and decimals.

Activities:

- Attend a synchronous lecture delving into fractions and decimals.
- Complete asynchronous practice exercises.

Self-Directed Learning (2.5 hours)

Activities:

- Further practice problems to reinforce understanding.

Assessment:

- Submit an assignment applying fractions and decimals.

Week 2: Prescription Interpretation and Dosage Calculations

Learning Outcomes**:** By the end of this module, students will be able to:

- Interpret prescriptions and convert measurements across different systems.
- Calculate dosages based on body weight and body surface area.

Session 1: Interpreting Prescriptions and Converting Measurements

Synchronous Instruction (2.5 hours)

Topics:

- Navigating prescription interpretation and measurement conversion.

Activities:

- Join a synchronous lecture on understanding prescriptions.
- Work through asynchronous practice for measurement conversion.

Self-Directed Learning (2.5 hours)

Activities:

- Additional exercises for honing prescription interpretation.

Assessment:

- Take a quiz evaluating your grasp of prescription interpretation.

Session 2: Dosage Calculations Based on Body Weight

Synchronous Instruction (2.5 hours)

Topics:

- Grasping dosage calculations involving weight and body surface area.

Activities:

- Attend a synchronous lecture on weight-based dosing.
- Engage in asynchronous practice problems.

Self-Directed Learning (2.5 hours)

Activities:

- Further exercises to solidify weight-based dosage calculations.

Assessment:

- Submit an assignment involving dosage calculations based on body weight.

Week 3: Pricing, Inventory Control, and Compounding Calculations

Learning Outcomes**:** By the end of the module, students will be able to:

- Calculate pricing for medications and understand customary prices.
- Grasp inventory control concepts and perform calculations for compounding.

Session 1: Calculating Medication Pricing and Customary Prices

Synchronous Instruction (2.5 hours)

Topics:

- Mastering pricing calculations and understanding customary pricing.

Activities:

- Participate in a synchronous lecture on medication pricing.
- Engage in asynchronous practice problems.

Self-Directed Learning (2.5 hours)

Activities:

- Further exercises to reinforce pricing calculation skills.

Assessment:

- Complete an assignment on calculating medication prices.

Session 2: Inventory Control and Compounding Calculations

Synchronous Instruction (2.5 hours)

Topics:

- Understanding inventory control and performing compounding calculations.

Activities:

- Attend a synchronous lecture on inventory management.
- Work through asynchronous practice problems related to compounding.

Self-Directed Learning (2.5 hours)

Activities:

- Additional exercises to enhance inventory and compounding calculation skills.

Assessment:

- Take a quiz evaluating your grasp of inventory control and compounding calculations.

Week 4: Advanced Calculations and Practical Applications

Learning Outcomes**:** By the end of this module, students will be able to:

- Master parenteral dosing calculations and calculations involving percentages.
- Perform calculations with solutions and interpret medication labels.

Session 1: Parenteral Dosing and Percentage Calculations

Synchronous Instruction (2.5 hours)

Topics:

- Mastering parenteral dosing using ratio and proportion and tackling percentage calculations.

Activities:

- Participate in a synchronous lecture on parenteral dosing.
- Engage in asynchronous practice problems involving percentages.

Self-Directed Learning (2.5 hours)

Activities:

- Further exercises to solidify parenteral dosing and percentage calculation skills.

Assessment:

- Submit an assignment on parenteral dosing and percentages.

Session 2: Calculations with Solutions and Medication Labels

Synchronous Instruction (2.5 hours)

Topics:

- Navigating calculations involving solutions and interpreting medication labels.

Activities:

- Attend a synchronous lecture on solution-related calculations.
- Work through asynchronous exercises on interpreting medication labels.

Self-Directed Learning (2.5 hours)

Activities:

- Additional exercises to enhance skills with solutions and medication labels.

Review and Exam Preparation

Synchronous Instruction (2.5 hours)

Topics

- Comprehensive review of key concepts and strategies for exam preparation.

Activities:

- Participate in a synchronous review session covering all major topics.
- Engage in self-directed practice with exam-style questions.

Self-Directed Learning (2.5 hours)

- Continued self-review and preparation for final assessments.

Assessment:

- Complete final exam preparation tasks.

Assessment and Review:

- Weekly quizzes and assignments (40%)
- Mid-term exam (20%)
- Final exam (30%)
- Participation in synchronous and asynchronous sessions (10%)Top of Form

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Sample Lesson Plan: Advanced Calculations and Practical Applications

Lesson Duration:

- 5 hours
- 2.5 hours online synchronized instruction
- 2.5 hours of online self-directed learning

Learning Outcomes: By the end of this lesson, students will be able to:

- Understand the importance of accurate parenteral dosing in pharmacy practice.
- Apply ratio and proportion for parenteral dosing calculations.
- Perform calculations involving percentages in pharmacy contexts.

Textbook: e-texts have Power Point slides, Instructor manual, tests, and test banks to support instructional delivery:

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Materials:

- Lecture slides on parenteral dosing and percentages.
- Case studies highlighting parenteral dosing challenges.
- Example problems for ratio and proportion calculations.
- Practical exercises for percentage calculations.
- Interactive problem-solving exercises.

Lesson Outline:

Introduction

Online Synchronous Instruction (2.5 hours)

Topic: Introduction to Parenteral Dosing

- Lecture on the significance of accurate parenteral dosing.

- Discussion on challenges and implications of incorrect dosing.
- Case studies showcasing the importance of precise parenteral calculations.

Topic: Ratio and Proportion for Parenteral Dosing

- Lecture on the concept of ratio and proportion in pharmacy calculations.
- Application explanation in parenteral dosing.
- Step-by-step examples of parenteral dosing calculations using ratio and proportion.

Topic: Calculations with Percentages

- Overview of using percentages in pharmacy calculations.
- Practical exercises involving percentage calculations for concentrations and pricing.

Break

Self-Directed Learning (2.5 hours)

Activity: Problem Solving- Interactive Workshop

- Assign problem-solving exercises related to parenteral dosing and percentages.
- Submit of solutions and approaches for assessment.

Activity: Application in Clinical Scenarios

- Review of case studies involving parenteral dosing calculations and percentages.
- Reflection on scenarios where precise calculations are crucial for patient safety.

Activity: Recap and Preparing for Assessment

- Reviewing key concepts covered in the lesson.
- Self-assessment quizzes to gauge individual understanding.
- Preparing for the final assessment and upcoming lessons.

Assessment- Criteria

- Participation and engagement during synchronous instruction.
- Submission of problem-solving exercises and solutions.
- Contribution to case study discussions during asynchronous self-study.
- Completion of self-assessment quizzes to assess individual understanding.

Conclusion and Recap

- Summarize the key points covered in the lesson.
- Address any remaining questions or concerns.

Homework Assignment:

- Review the interactive workshop exercises.
- Reflect on the application of percentages in real-world pharmacy scenarios.

Learning Outcomes Review:

- Revisit the learning objectives and discuss how they were met during the lesson.

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Course Rubric: Pharmaceutical CalculationsTop of Form

Assessment Criteria	Excellent (4)	Proficient(3)	Competent (2)	Developing (1)	Not Evident(0)
Class Participation	Actively engages in discussions, contributes thoughtfully	Engages in discussions, contributes consistently	Participates, though may need prompting at times	Participation is sporadic and lacks engagement	Lacks participation and engagement in class activities
Weekly Quizzes and Assignments	Consistently demonstrates strong understanding and application	Shows solid understanding and application	Demonstrates basic understanding and application	Struggles with understanding and application	Unable to grasp and apply concepts, frequent errors
Final Exam	Exceptionally well-prepared and demonstrates comprehensive understanding	Well-prepared and demonstrates good understanding	Adequately prepared, though may show gaps in understanding	Insufficiently prepared, significant gaps in understanding and application	Lacks preparation and understanding, significant errors
Understanding Numeral Systems in Pharmacy	Demonstrates a deep understanding of numeral systems in pharmacy and can apply concepts effectively.	Understands numeral systems well and can apply concepts proficiently.	Understands basic numeral systems and their application.	Displays limited understanding of numeral systems and their practical implications.	Fails to grasp numeral systems in pharmacy.
Mastering Addition and Subtraction of Fractions	Performs addition and subtraction of fractions flawlessly, demonstrating strong mathematical skills.	Performs addition and subtraction of fractions accurately and efficiently.	Performs addition and subtraction of fractions with minor errors.	Struggles with addition and subtraction of fractions, frequent errors.	Lacks proficiency in addition and subtraction of fractions.
Accurate Rounding of Decimals	Demonstrates precision in rounding decimals and applying rounding rules accurately.	Rounds decimals with accuracy and applies rounding rules effectively.	Rounds decimals with occasional errors in rounding or application of rules.	Struggles with rounding decimals, inconsistent accuracy in applying rules.	Lacks accuracy and understanding of rounding decimals.
Effective Application of Ratio and Proportion in Pharmacy Calculations	Applies ratio and proportion techniques flawlessly to solve complex pharmacy calculations.	Applies ratio and proportion techniques proficiently to solve a variety of pharmacy calculations.	Applies ratio and proportion techniques with minor errors in some scenarios.	Struggles with the application of ratio and proportion techniques, frequent errors.	Lacks effective application of ratio and proportion techniques.

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