

NRPM 102: Medical Math & Pharmacological Principles Syllabus

[Semester and year]



Instructor information

Instructor	Email Address	Office hours
Paula Johnson	Paula.johnson@princetonrescue.com	Vary

General information

Description

This course provides the learner with an introduction to medication dose calculations, and pharmacological principles including pharmacokinetics and pharmacodynamics, mechanisms of action, disease pathology, and review common medications that affect various body systems.
Co-Requisite: NRPM 102L

Expectations and goals

Upon Successful completion of this course, students will be able to:

- List the four main sources of drug products.
- List the components of a drug profile.
- Discuss the Paramedic's responsibilities and scope of management pertinent to the administration of medications, including special considerations for pregnant, pediatric, and geriatric patients.
- Differentiate between enteral and parenteral routes of drug administration.
- Describe mechanisms of drug action.
- List and differentiate the phases of drug activity, including the pharmaceutical, pharmacokinetic, and pharmacodynamics phases.
- Discuss considerations for storing and securing drugs.
- Describe the mathematical principles used in pharmacology and for calculating medication doses (bolus and maintenance infusion).

Course Delivery Method: Hybrid

Course materials

Required materials

Computer with Internet capabilities to access:

- <https://CourseSites.com>

Optional materials

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Required text

- Nancy Caroline's *Emergency Care in the Streets*; 8th edition, 2013 by Elling and Smith; Publisher Jones and Bartlett. ISBN: 978-1-284-13718-7

Course schedule (*Weeks correspond to semester schedule)

Week	Topic	Pre-Class Assignment	Class Session	Reflective Assignment <i>(DUE: Friday after class session)</i>
5	Intro to Pharmacology, Pharmacokinetics and Pharmacodynamics, Nervous System Review, Fluids and Blood Admin. Emergency Medications	Video Lecture: (#1-2) <i>Both videos are due before class on week 5</i>	Medication Assessment Scenarios #1-3 (facilitated group activity) Emergency Med Presentation (<i>facilitated group activity/lecture with concept mapping</i>)	<ul style="list-style-type: none"> • Virtual Patient Encounter: Pharmacology (Video Case Based Learning) • Drug Profile Project (<i>Portfolio of Learning</i>)
6	Metric System, apothecaries' system, medication orders, mathematical principles using decimals, adding, subtracting, multiplying, dividing, rounding, and ratio, conversions, calculate dosing, calculate infusions, convert temperatures	NO PRE-CLASS ASSIGNMENTS	Mathematical Principles: Basics/Calculator Use	<ul style="list-style-type: none"> • Worksheets - multiplication with decimals, division with decimals, temperature conversions
7			Fractions and Algebra in Pharmacology	<ul style="list-style-type: none"> • Quiz: Drug Calc #1
8			Conversions in weight	<ul style="list-style-type: none"> • Quiz: Drug Calc #2
9			Algebra in pharmacology - infusions	<ul style="list-style-type: none"> • Quiz: Drug Calc #3
				SUMMATIVE Written Exam NRPM 102

Procedures for Evaluation

- *Students must complete each NRPM course with a grade point average of at least 70%. Any student who does not have a 70% average at the completion of an NRPM course will not be allowed to continue in the program. The student's academic standing will be discussed with the student periodically throughout the program.
- If a student scores below a 70% on a NRPM Cumulative examination, the student will be required to retake the examination until a score of 70% is attained; however, the original score will stand as the recorded score.

***NOTE:** NRPM 202 is the exception to this policy. In this course, you must successfully complete each sub-specialty based on the criteria from each governing agency. The final grade issued for this course will be a “pass/fail.” If the student is unable to receive a passing grade for this class, the student will NOT be allowed to continue in the Paramedic Program.

Grading Components and Weights:

The Paramedic Program Student’s Classroom Assessment grade will be the sum of the weighted scores comprising the parameters of course work outlined below.

Didactic Courses	
80%	<i>Coursework</i> <ul style="list-style-type: none">• Homework/Special Projects - 5%• Quizzes - 5%• Case Studies/Objectives - 20%• Exams - 50%
20%	<i>Monthly Behavioral Evaluations</i>

Grading Scale:

100-90 = A 89-80 = B 79-70 = C 69-60 = D <59 = F

All students must maintain a C average in each course to continue throughout the program

Attendance Policy

All material is important to your success; therefore, students absent more than 5% of the course without a valid excuse will be dismissed from the program of study.

There are two types of absences recognized as a “valid excuse” by Princeton Rescue Squad’s Education Department: (1) absence resulting from participation in an activity where you are officially representing the Education Department; and (2) absence caused by unforeseeable and unavoidable circumstance which is beyond your control. All other absences are considered willful and will not count as excused. It is your responsibility to provide your instructor with a proper explanation and documentation of these valid absences. It is the responsibility of the student to make up any work or testing missed. The missed (comparable) coursework and exams must be completed within 72 hours of the absence and prior to the last date of the class.

Online Video course Lectures associated with “Hybrid” classes are required to be completed by 10am on the morning of the deadline listed. These deadlines are typically due weekly and attendance will be taken based on your submission of these Lectures. If you fail to submit the Lecture when due, you will be marked absent for that week’s hybrid class.

Tardiness will not be tolerated. Any student who shows up later than 15 minutes into the beginning of a course or leaving a class session 30 minutes or more before the end of the class day will result in the mark of tardy on his/her record. An accumulation of 5 tardies will result in an unexcused absence.

Students may withdraw from the course at any time. Any student that misses more than two (2) consecutive class sessions without contacting the course instructor will be considered to have withdrawn from the course.

Student Advisory and Evaluation

Faculty will routinely discuss student progress throughout the program of study at regular intervals (increments no longer than 25% of the program) to provide learners with adequate chances to take corrective actions. During these mandatory meetings with a student item(s) or subject(s) of concern to discuss may include, but are not limited to:

Excessive absences and tardiness, failure to turn in assignments / clinical rotations on time, classroom / clinical behavior concerns, plagiarism, cheating, struggling or failure to maintain a GPA of 70%, etc.

A Student Advisory Form will be filled out and signed by both the Faculty member addressing the concern, and the student. Once the concern has been documented, the Program Instructor and student will discuss possible resolutions to the problem and a proposed action plan will be written on the Advisory Form. The student may use the Advisory Form to record a rebuttal against the initial concern or proposed action plan. The instructor will then mark the form “unresolved” and forward it to the Education Director who investigate the matter and make a determination on a second Advisory Form. Copies of these completed Advisory Forms are available to the student; however, originals must and will be retained by the Education Program.

Standards of Conduct Regarding Cell Phone Use

As adults, you are permitted to retain your cellular devices unless during testing. At that time, all cell phones must be placed in a bag away from your testing area or given to your instructor until the testing is complete. It is common during lecture for students to utilize their cell phones to look up information regarding topics discussed in the class session, and this practice is permitted. However, if the instructor or other member of the instructional or administrative staff see that cell phones are being used for other purposes (ie: facebook, messenger, etc.) during lecture, lab, or any other designated course activity then the following discipline policy will take place:

- First offense - verbal warning
- Second offense - written warning
- Third offense - dismissal from the program

Academic Dishonesty

As a student and pre-hospital professional, you are expected to adhere to a professional code of conduct and not engage in plagiarism, cheating, falsifying information or records, or any other such activity. Failure to adhere to this code of conduct will result in disciplinary action up to and including dismissal from the program.

Grounds For Dismissal

A student may be dismissed from the program for the following reasons:

1. Absenteeism greater than 1 unexcused class.
2. Receiving a “D” or “F” as a cumulative grade for the course.
3. Insubordination (in class, lab, or in clinical)
4. The conviction and/or known use of, distribution of, or possession of illegal drugs, or controlled substances.
5. Failure to accomplish clinical assignments and objectives

6. Unprofessional or unethical conduct
7. Cheating in related or professional EMS courses or in clinical documentation.

NRPM 102 Course Objectives:

1. Explain how pharmacology relates to paramedic clinical practice.
2. Describe the regulatory measures affecting medications administered in the prehospital setting.
3. Outline reliable sources of medication information available to paramedics.
4. Discuss requirements for medication storage, security, and accountability.
5. Describe the pharmacokinetic and pharmacodynamic properties of medications in general as well as those routinely administered by paramedics.
6. Identify situations where medication effects will be altered by the age, sex, weight, and other characteristics of a particular patient
7. Present steps to reduce the incidence of medication errors and limit the severity of harmful effects associated with medication administration.
8. Select the optimal medication and method of medication administration for patients with a particular clinical condition or situation.
9. Discuss the prevention, recognition, and management of adverse medication reactions.
10. Describe specific medications used by paramedics in the prehospital setting.
11. List notable classes of medications that may be taken by patients in the prehospital setting.
12. Explain the “six rights” of medication administration and describe how each one relates to EMS.
13. Describe the role of medical direction in medication administration, and explain the difference between direct orders (online) and standing orders (off-line).
14. Explain why determining what prescription and over-the-counter (OTC) medications a patient is taking is a critical aspect of patient assessment during an emergency.
15. Discuss the systems of weights and measures used when administering medication.
16. Explain principles of drug dose calculations, including desired dose, concentration on hand, volume on hand, volume to administer, and IV drip rate.

Overview of Semester Class Schedule:

	NRPM 101	NRPM 102	NRPM 102L	NPRM 103	NRPM 104	NRPM 104L	NRPM 106	NRPM 106L	Total hrs/day
WEEK #									
1	5				2.5	0.83			8.33
2	5				2.5	0.83			8.33
3	5				2.5	0.83			8.33
4	5				2.5	0.83			8.33
5		2	3		2.5	0.83			8.33
6		2	3		2.5	0.83			8.33
7		2	3		2.5	0.83			8.33
8		2	3		2.5	0.83			8.33
9		2	3		2.5	0.83			8.33
10				2.2	2.5	0.83	1.2	1.6	8.33
11				2.2	2.5	0.83	1.2	1.6	8.33
12				2.2	2.5	0.83	1.2	1.6	8.33
13				2.2	2.5	0.83	1.2	1.6	8.33
14				2.2	2.5	0.83	1.2	1.6	8.33
15				2	2.5	0.83	1.4	1.6	8.33
16				2	2.5	0.85	2	1	8.35
17				2	2.5	0.85	1	2	8.35
18				2	2.5	0.85	0.6	2.4	8.35
	20	10	15	19	45	15	11	15	150

	Classes will meet on Tuesdays		
Course Legend:			
	Req. Hrs:	Start Time	End Time
NRPM 101: Introduction to Emergency Medical Care	20	1300	1800
NRPM 102: Medical Math and Pharmacological Principles	10	1300	1500
NRPM 102L: Pharmacological Techniques	15	1500	1800
NRPM 103: Introduction to Clinical Medicine & Assessment	19	1300	1515
NRPM 104: Anatomy & Physiology for Emergency Medical Care	45	900	1130
NRPM 104L: Anatomy & Physiology for Emergency Medical Care Lab	15	1130	1230
NRPM 106: Airway and Injury Management in the Field	11	1515	1630
NRPM 106L: Airway and Injury Management in the Field Lab	15	1630	1800
	150		