

# NRPM 109: Advanced ECG Interpretation & Cardiopulmonary Emergency Care Syllabus



[Semester and year]

## Instructor information

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

## General information

### Description

Students will integrate assessment, including but not limited to 12 Lead ECG, findings with principles of epidemiology and pathophysiology to formulate a field impression and implement a comprehensive treatment/disposition plan for a patient with a respiratory or cardiovascular complaint. *Pre-Requisites: NRPM 103, NRPM 104, NRPM 104L.*

### Expectations and goals

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

- Successfully perform the following skills without critical error:
  - 12 Lead ECG Interpretation - PPCP
  - Medical And Cardiac Physical Assessment - PPCP
- Discuss the pathophysiology, psychosocial impact, presentations, prognosis, and management of cardiovascular diseases.
- Discuss the pathophysiology, psychosocial impact, presentations, prognosis, and management of respiratory diseases.
- Describe a systematic approach to the analysis and interpretation of cardiac dysrhythmias and ST segment changes found in 12 lead ECG's.
- Explain how the 12 lead ECG correlates to the assessment findings in patients experiencing cardiovascular complaints.
- Given a specified scenario, integrate assessment findings, including but not limited to 12 lead ECG, with the pathophysiology to formulate a field impression and implement a comprehensive treatment plan for a patient with a respiratory and/or cardiovascular complaint.

**Course Delivery Method: Hybrid**

## Course materials

### Required materials

Computer with Internet capabilities to access:

- <https://CourseSites.com>
- <https://www.platinumplanner.com/>

### Optional materials

12-Lead ECG The Art of Interpretation: 2<sup>nd</sup> edition, 2015 by Garcia; Publisher Jones and Bartlett. ISBN: 978-0-7637-7351-9

### Required text

- Nancy Caroline's Emergency Care in the Streets; 8<sup>th</sup> 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>
2	<ul style="list-style-type: none"> <li>• Acute Upper Airway infections</li> <li>• Pulmonary infections</li> <li>• Spontaneous Pneumo</li> <li>• Obstructive Lung Disease</li> <li>• Neoplasm, Pertussis, Cystic Fibrosis</li> </ul>	<ul style="list-style-type: none"> <li>• Video Lecture: Resp. Emergencies (#1-2)</li> </ul>	<ul style="list-style-type: none"> <li>• Patient Condition Lab</li> <li>• Ausubel Triangle</li> <li>• Disease &amp; Medication Wkst (portfolio of learning)</li> </ul> Rote Skill Lab <ul style="list-style-type: none"> <li>• Medical Assessment</li> </ul> Peer Review Lab <ul style="list-style-type: none"> <li>• Medical Assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Case study: Asthma</li> <li>• Medication “Grab Bag”</li> </ul>
3	<ul style="list-style-type: none"> <li>• ACS: Angina/MI</li> <li>• Heart Failure: R, L, CHF</li> <li>• Cardiogenic Shock</li> </ul>	Video Lecture #1: Cardiology	Disease & Medication Wkst (portfolio of learning)	<ul style="list-style-type: none"> <li>• Video Case: 45 y/o: Edema/CP</li> <li>• Case Study: Cardiogenic Shock</li> </ul>
4	<ul style="list-style-type: none"> <li>• Hypertensive Emergencies</li> <li>• Non-traumatic cardiac tamponade</li> <li>• Vascular Disorders</li> </ul>	Video Lecture #2: Cardiology	Disease & Medication Wkst (portfolio of learning)	<ul style="list-style-type: none"> <li>• Case Study: Hypertensive Emergencies</li> <li>• Case study: Fibrinolytics</li> <li>• Virtual Patient Encounter: PE</li> </ul>
11-12	<ul style="list-style-type: none"> <li>• Cardiac Rhythm Disturbances</li> </ul>	Video Lecture: 12 Lead interpretation (#1-3)	<ul style="list-style-type: none"> <li>• Lecture: 12 Lead interpretation with 12 Lead Reinforcement activity</li> <li>• Peer Review Skill Lab: 12 Lead ECG</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz: 12 Lead</li> </ul>
13	<ul style="list-style-type: none"> <li>• Infectious Diseases of the heart</li> <li>• Congenital abnormalities</li> </ul>	<ul style="list-style-type: none"> <li>• (discussed in Video Lecture #2)</li> <li>• Khan Academy: Cyanotic/Acyanotic Heart Defects</li> </ul>	<ul style="list-style-type: none"> <li>• Heart Sound Training</li> <li>• Ausubel Triangle (portfolio of learning)</li> </ul>	
				<ul style="list-style-type: none"> <li>• <b>SUMMATIVE WRITTEN AND SKILL EXAM ALL COURSE TOPICS</b></li> </ul>

## Procedures for Evaluation

- A. \*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.
- B. 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.
- C. Individual skills that comprise a skill lab are mandatory per the National Registry of EMT’s. A student must complete each skill with the minimum points required AND the established number of SUCCESSFUL attempts meeting those minimum point standards. A percentage grade will be issued to the student based on the points obtained per attempt, active participation in lab sessions and the accuracy of his/her platinum documentation.
- D. Late submission of platinum documentation will receive a 10-point deduction in grade for each class day in which it wasn’t handed in.

**\*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	Skill Lab
80% Coursework <ul style="list-style-type: none"> <li>• Homework/Special Projects - 5%</li> <li>• Quizzes - 5%</li> <li>• Case Studies/Objectives - 20%</li> <li>• Exams/Platinum Documentation - 50%</li> </ul>	Skill Lab: Pass/Fail ( <i>minimum points required per skill mandated based on NREMT - PPCP criteria</i> )
20% Monthly Behavioral Evaluations	

Items required for skill labs	Minimum Points Required	Total Items required in Peer Review	Total Instructor Review
12 Lead ECG - PPCP	30	2	
Medical & Cardiac Physical Assessment	130	2	1

## 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 109 Course Objectives:

1. Discuss the epidemiology, morbidity, and mortality of respiratory illness in the United States.
2. Define hypoventilation and hyperventilation, and outline the conditions with which they are often associated.
3. List the structures of the upper and lower airways and accessory structures of the respiratory system.
4. List the three primary functions of the respiratory system.
5. Explain how gas exchange occurs at the interface of the alveoli and the pulmonary capillary bed.
6. Analyze the neurologic, cardiovascular, muscular, and renal mechanisms of respiratory control.
7. Analyze proper measures for ensuring scene safety when called to care for a patient with dyspnea.
8. Describe the factors that contribute to a general impression of the patient’s condition and an accurate estimation of his or her degree of respiratory distress.
9. Discuss the typical presentation of a patient with dyspnea, and list the signs and symptoms that indicate a high level of respiratory distress.

10. Explain the special patient assessment and care considerations for older adult patients with respiratory distress.
11. Identify breathing alterations that may indicate respiratory distress, and become familiar with the signs of increased work of breathing.
12. Describe the abnormal breathing patterns associated with neurologic insults that depress the respiratory center in the brain.
13. Become familiar with the signs of lung consolidation, including abnormal breath sounds associated with excessive fluid in the lungs
14. Explain how to assess the adequacy of the circulation of a patient with dyspnea.
15. Discuss how transport decisions are made for patients with respiratory distress.
16. Describe how to investigate the chief complaint of a patient who is having trouble breathing.
17. Identify each component of the SAMPLE history as it applies to patients with dyspnea.
18. List the over-the-counter medications likely to be used by patients with respiratory conditions, and explain what each is used for.
19. Describe the components of the physical examination of a patient with dyspnea.
20. Survey the devices used to monitor patients with respiratory complaints.
21. Describe interventions available for treating patients with dyspnea.
22. Discuss the pathophysiology, assessment, and management of a patient whose upper airway has an anatomic or foreign body obstruction.
23. Discuss the pathophysiology, assessment, and management of a patient who has upper airway inflammation caused by infection.
24. Discuss the pathophysiology, assessment, and management of a patient who has aspirated food, liquid (including blood), or a foreign body.
25. Discuss the pathophysiology, assessment, and management of a patient with an obstructive lower airway disease.
26. List and explain the three features that characterize asthma and how each is treated.
27. Compare the signs and symptoms of asthma, emphysema, and chronic bronchitis.
28. Discuss complications that can cause a patient with COPD to decompensate.
29. Explain the concepts of hypoxic drive and auto-PEEP as they relate to COPD
30. Discuss the pathophysiology, assessment, and management of patients with pulmonary infections, atelectasis, cancer, toxic inhalations, pulmonary edema, and acute respiratory distress syndrome.
31. Discuss the pathophysiology, assessment, and management of patients with pneumothorax, pleural effusion, and pulmonary embolism.
32. Describe age-related variations in respiratory anatomy and the pathophysiology of respiratory disease.

**Affective-**

1. Recognize and value the assessment and treatment of patients with respiratory diseases.
  2. Indicate appreciation for the critical nature of accurate field impressions of patients with respiratory diseases and conditions.
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1. Describe risk factors related to cardiovascular disease.
  2. Explain patient assessment procedures for cardiovascular problems, including scene size-up, primary assessment, history taking, secondary assessment, and reassessment.
  3. Recognize the medications commonly prescribed to patients with cardiovascular diseases.
  4. Describe the placement of 12-lead ECG leads.

5. Describe the placement of 15- and 18-lead ECG leads.
6. Understand how to interpret 12-lead ECG findings, including atrial, junctional, and ventricular rhythms.
7. Understand the indications and procedure for operating an automated external defibrillator (AED).
8. Describe the pathophysiology of atherosclerosis, peripheral vascular disorders, acute coronary syndrome, and angina pectoris.
9. Discuss the assessment and management of coronary disease and angina.
10. List the signs and symptoms of acute myocardial infarction (AMI).
11. Explain the procedure for managing AMI and suspected AMI in the field, including STEMI and non-STEMI presentations.
12. Understand the benefits of reperfusion techniques (fibrinolysis and percutaneous intervention) in patients with AMI or suspected AMI.
13. Discuss the pathophysiology of congestive heart failure and its signs, symptoms, and treatment.
14. Discuss the pathophysiology of cardiac tamponade and its signs, symptoms, and treatment.
15. Discuss the pathophysiology of cardiogenic shock and its signs, symptoms, and treatment.
16. Describe the pathophysiology, assessment, and management of aortic aneurysms, including both acute dissecting aneurysm of the aorta and expanding and ruptured abdominal aortic aneurysms.
17. Discuss the pathophysiology of hypertensive emergencies and their signs, symptoms, and treatment.
18. Describe the risks posed by thromboembolism
19. Identify types of congenital heart disease.
20. Describe the pathophysiology of hypertrophic cardiomyopathy.
21. Describe the pathophysiology of other cardiovascular anomalies: coarctation of the aorta, truncus arteriosus, tricuspid atresia, hypoplastic left heart syndrome, tetralogy of Fallot, transposition of the great arteries, and total anomalous pulmonary venous return. (see chapter, *Neonatal Emergencies*)
22. Describe how infections—endocarditis, pericarditis, and rheumatic fever—can damage the heart.

#### **Affective-**

1. Value the sense of urgency for initial assessment and intervention in the patient with cardiac compromise.
2. Value and defend the sense of urgency necessary to protect the window of opportunity for reperfusion in the patient with suspected myocardial infarction.
3. Defend patient situations where ECG rhythm analysis is indicated.
4. Based on the pathophysiology and clinical evaluation of the patient with acute myocardial infarction, characterize the clinical problems according to their life-threatening potential.
5. Defend the measures that may be taken to prevent or minimize complications in the patient with a suspected myocardial infarction.
6. Defend the urgency based on the severity of the patient's clinical problems in a hypertensive emergency.
7. From the priority of clinical problems identified, state the management responsibilities for the patient with a hypertensive emergency.
8. Based on the pathophysiology and clinical evaluation of the patient with vascular disorders, characterize the clinical problems according to their life-threatening potential.
9. Value and defend the sense of urgency in identifying peripheral vascular occlusion.
10. Value and defend the sense of urgency in recognizing signs of aortic aneurysm.

## NRPM 109 Psychomotor Objectives:

1. Demonstrate proper use of airway and ventilation devices.
2. Conduct a history and patient assessment for patients with pulmonary diseases and conditions.
3. Demonstrate the application of a CPAP/ BiPAP unit.
4. Demonstrate how to set and adjust the ECG monitor settings to varying patient situations.
5. Perform, document and communicate a cardiovascular assessment.
6. Given a specified scenario, integrate assessment findings, including but not limited to 12 lead ECG, with the pathophysiology to formulate a field impression and implement a comprehensive treatment plan for a patient with a respiratory and/or cardiovascular complaint.

## Overview of Semester 2 Class Schedule:

WEEK #	NRPM 108	NRPM 109	NRPM 111	NPRM 111L	NRPM 110	NRPM 112	NRPM 113	Total hrs/day
1	3		5					8
2		2	5		1			8
3		2	5		1			8
4		2		5	1			8
5				5			3	8
6				5			3	8
7	5						3.5	8.5
8	5						3.5	8.5
9	5				1		2.5	8.5
10	5				1		2.5	8.5
11		6			1		1.5	8.5
12		6			1		1.5	8.5
13		6			1		1.5	8.5
14					1		7.5	8.5
15					1		7.5	8.5
16							8.5	8.5
17						4	4.5	8.5
18						4	4.5	8.5
	23	24	15	15	10	8	55	150

Course Legend:	Classes will meet on Tuesdays		
	Req. Hrs:	Start Time	End Time
NRPM 108: Basic ECG Interpretation and Cardiopulmonary Emergency Care	23	900	~1400
NRPM 109: Advanced ECG Interpretation & Cardiopulmonary Emergency Care	24	900	~1500
NRPM 111: Maternal and Child Emergency Care	15	~1300	~1800
NRPM 111L: Maternal and Child Emergency Care Lab	15	~1300	~1800
NRPM 110: Medical Emergency Pre-Hospital Care	10	~1500	~1600
NRPM 112: Special Considerations in Pre-Hospital Care	8	900	1300
*NRPM 113: Simulation Lab 1	55	~1300	1830
**NRPM 114: Clinical Practicum 1	72	Based on student avail.	
	222		