

# NRPM 108: Basic ECG Interpretation and Cardiac Resuscitation Syllabus

[Semester and year]



## Instructor information

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

## General information

### Description

This course reviews the basics of cardiac electrophysiology, waves and measurements, and the interpretation of ECG's from continuous waveform monitoring. Based on this information, students will apply their knowledge to implement a treatment plan for patients experiencing cardiac dysrhythmias which require advanced emergency care based on the American Heart Association and Emergency Cardiovascular Care Guidelines. *Pre-Requisites: NRPM 102, NRPM 102L.*

### Expectations and goals

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

- Successfully perform the following skills without critical error:
  - Synchronized Cardioversion - PPCP
  - Defibrillation - PPCP
  - Transcutaneous Pacing - PPCP
  - Medical and Cardiac Physical Assessment - PPCP
- Explain the purpose of ECG monitoring and its limitations.
- Describe how ECG waveforms are produced and correlate the electrophysiological and hemodynamic events occurring throughout the entire cardiac cycle with the various ECG waveforms, segments, and intervals.
- Describe a systematic approach to the analysis and interpretation of cardiac dysrhythmias.
- Identify the specific mechanical, pharmacological, and electrical therapeutic interventions for patients with dysrhythmias causing compromise.

**Course Delivery Method: Hybrid**

## Course materials

### Required materials

Computer with Internet capabilities to access:

- <https://CourseSites.com>

• <https://www.platinumplanner.com/>

### Optional materials

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### 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>
1	<ul style="list-style-type: none"> <li>• Cardiac Rhythm Disturbances</li> <li>• Advanced Cardiac Life Support</li> </ul>		Lecture: Cardiac A&P / Electrophysiology Review (including SR)	<ul style="list-style-type: none"> <li>• Quiz: Lead 2 Wkst</li> <li>• Quiz: ACLS algorhythm</li> </ul>
7			Lecture/Practice: Rhythm Recognition (Atrial)	<ul style="list-style-type: none"> <li>• Quiz: Rhythm Recognition (atrial)</li> <li>• Quiz: ACLS algorhythm</li> </ul>
8			<ul style="list-style-type: none"> <li>• Lecture/Practice: Rhythm Recognition (junctional)</li> <li>• Lecture: ACLS Algorhythm</li> <li>• Rote Skill Lab: TCP</li> <li>• Peer Review Skill Lab: TCP</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz: Rhythm Recognition (junctional)</li> <li>• Quiz: ACLS algorhythm</li> </ul>
9			<ul style="list-style-type: none"> <li>• Lecture/Practice: rhythm Recognition (HB)</li> <li>• Lecture: ACLS Algorhythm</li> <li>• Rote Skill Lab; Synch. Cardioversion</li> <li>• Peer Review Skill Lab; Synch. Cardioversion</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz: Rhythm Recognition (HB)</li> <li>• Quiz: ACLS algorhythm</li> </ul>
10			<ul style="list-style-type: none"> <li>• Lecture/Practice: rhythm Recognition (ventricular)</li> <li>• Lecture: ACLS Algorhythm</li> <li>• Rote Skill Lab: Defibrillation</li> <li>• Peer Review Skill Lab: Defibrillation</li> </ul>	<ul style="list-style-type: none"> <li>• Video Case: 2 Arrests, 2 Outcomes</li> <li>• Quiz: Rhythm Recognition (HB)</li> <li>• Quiz: ACLS algorhythm</li> <li>• Case Study: megacode meds, PEA/Asystole, Additional Card. Drugs</li> </ul>
				<b>SUMMATIVE WRITTEN EXAM</b>

## 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 grade will be issued to the student based on their participation in lab sessions and their reporting in platinum planner.
- 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	Skill Lab
<b>80% Coursework</b> <ul style="list-style-type: none"> <li>• Homework/Special Projects - 5%</li> <li>• Quizzes - 5%</li> <li>• Case Studies/Objectives/Skill - 20%</li> <li>• Exams/Platinum Documentation - 50%</li> </ul>	<b>Skill Lab: Pass/Fail</b> ( <i>minimum points required per skill mandated based on NREMT - PPCP criteria</i> )
<b>20% Monthly Behavioral Evaluations</b>	

Items required for skill labs	Minimum Points Required	Total Items required in Peer Review	Total Instructor Review
Synchronized Cardioversion - PPCP	34	2	1
Defibrillation - PPCP	36	2	1
Transcutaneous Pacing - PPCP	34	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. 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 108 Course Objectives:

1. Understand the basic structure and function of the cardiovascular system.
2. Identify the major normal and abnormal heart sounds.
3. Describe the cardiac cycle, including diastole and systole.
4. Identify the various types of blood vessels.
5. Explain how the heart functions as a pump, including the concepts of cardiac output, stroke volume, heart rate, and ejection fraction.
6. Understand how electrical conduction activity occurs within the heart.
7. Understand how the autonomic nervous system controls the functioning of the heart.
8. Identify the various classes of drugs that influence the sympathetic nervous system.
9. Understand how the sympathetic nervous system regulates blood pressure.
10. Describe the placement of leads and electrodes in 3-lead ECG monitoring.
11. Identify the components of an ECG rhythm strip.

12. Understand how to determine heart rate.
13. Recognize normal sinus rhythm, and list the various types of cardiac dysrhythmias.
14. Discuss manual defibrillation, cardioversion, and transcutaneous pacing as techniques for managing cardiac emergencies.
15. Understand the indications and procedure for operating an automated external defibrillator (AED).
16. Describe emergency medical care for the symptomatic patient with bradycardia.
17. Describe emergency medical care for the symptomatic patient with tachycardia.
18. Describe emergency medical care for the patient with cardiac arrest, including the elements of basic life support (BLS) and advanced cardiac life support (ACLS).
19. Describe the components of care following resuscitation, including how to determine return of spontaneous circulation.
20. Value the sense of urgency for initial assessment and intervention in the patient with cardiac compromise.
21. Defend patient situations where ECG rhythm analysis is indicated.
22. Value and defend the application of transcutaneous pacing system.
23. Value and defend the urgency in identifying pacemaker malfunction.
24. Value and defend the urgency in rapid determination of and rapid intervention of patients in cardiac arrest.
25. Value and defend the possibility of termination of resuscitative efforts in the out-of-hospital setting.

#### **NRPM 108 Psychomotor Objectives:**

1. Demonstrate how to set and adjust the ECG monitor settings to varying patient situations.
2. Demonstrate a working knowledge of various ECG lead systems.
3. Demonstrate how to record an ECG.
4. Perform, document and communicate a cardiovascular assessment.
5. Set up and apply a transcutaneous pacing system.
6. Given the model of a patient with signs and symptoms of heart failure, position the patient to afford comfort and relief. (P-2 )
7. Demonstrate how to determine if pulsus paradoxus, pulsus alternans or electrical alternans is present.
8. Demonstrate satisfactory performance of psychomotor skills of basic and advanced life support techniques according to the current American Heart Association Standards and Guidelines, including:
  - a. Cardiopulmonary resuscitation
  - b. Defibrillation
  - c. Synchronized cardioversion
  - d. Transcutaneous pacing
  - e. Complete a communication patch with medical direction and law enforcement used for termination of resuscitation efforts.
  - f. Demonstrate how to evaluate major peripheral arterial pulses.

**Overview of Semester Class Schedule:**

	NRPM 108	NRPM 109	NRPM 111	NRPM 111L	NRPM 110	NRPM 112	NRPM 113	Total hrs/day
WEEK #								
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:	Req. Hrs:	Classes will meet on Tuesdays	
		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		