

# Arizona Peace Officer Standards and Training

## Basic Curriculum Lesson Plan

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**LESSON TITLE: PHYSICAL FITNESS - CARDIOVASCULAR PRESCRIPTION 8.3**

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SUBJECT:	Section 11
AZ POST DESIGNATION:	8.3.11
HOURS:	1.5
INSTRUCTOR TO STUDENT RATIO:	
COURSE CONTENT:	Through lecture and demonstration, this course of instruction will inform the student on the principles of developing a cardiovascular training program. In addition, this course covers the biomechanics of running and choosing proper equipment.
PERFORMANCE OBJECTIVES:	Upon completion of this course of instruction, students using notes, handouts and other support materials as references, within the allotted time, will be able to: <ul style="list-style-type: none"><li>8.3.11.1. Explain overload, specificity, and progression and how it is used to develop a cardiovascular training program.</li><li>8.3.11.2. Define F.I.T.T.</li><li>8.3.11.3. Determine one's target heart rate using the Karvonen method.</li><li>8.3.11.4. Define pronation and supination.</li><li>8.3.11.5. Define stride length.</li><li>8.3.11.6. Identify three (3) common causes of running injuries.</li><li>8.3.11.7. Identify seven (7) common running inefficiencies.</li><li>8.3.11.8. Identify the five (5) types of running shoes.</li></ul>

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REVIEWED – REVISED:		DATE:
AZ POST – APPROVAL:	Richard Watling	DATE: September 2008
AZ POST – APPROVAL:	Lori Wait	DATE: April 2022

LIST ANY PREREQUISITES:

LEAD INSTRUCTOR:

BACK-UP INSTRUCTOR(S):

INSTRUCTOR REFERENCES: Physical Fitness Specialist Course Manual compiled by the Cooper Institute of Aerobic Research, Dallas, Texas. Revised 2007. Running Injury Free, Joe Ellis and Joe Henderson, published by Rodale Press 1994.

CLASS LEVEL: Instructor

TRAINING AIDS: Computer-aided slides on PowerPoint software, computer and projector or overhead projector, treadmill or running track, handouts and demonstration shoes.

INSTRUCTIONAL STRATEGY: Instructional objectives will be obtained through the use of lecture, reading assignments, instructor demonstration and group participation.

SUCCESS CRITERIA: Success in this functional area will be demonstrated through the attainment of a 100% passing grade on a written objective examination comprised of multiple choice, true/false, and/or short answer questions.

COMPUTER FILE NAME: 8.3.11 Sec 11 Cardiovascular Prescription

DATE RELEASED TO THE SHARE FILE: May 27, 2022

**I. INTRODUCTION**

- A. Instructor(s) – (self) introduction.
- B. Preview of performance objectives.
  - 1. Ask students if they participated in a running race.
  - 2. Ask what types of activities are considered aerobic.
  - 3. Ask who has joined the NRA club after the academy? (Never Run Again club)
  - 4. Why is cardiovascular training important in law enforcement?

**II. PRINCIPLES OF TRAINING**

**P. O. 8.3.11.1**

- A. Overload.
  - 1. Perform more work than before.
  - 2. Increase frequency, duration, and intensity.
- B. Specificity.
  - 1. Train according to a goal.
  - 2. Relevant modes. (Modes are methods of training; running, hiking, swimming, cycling.)
- C. Progression.
  - 1. Increase overload gradually.
  - 2. Prevent injury and unsatisfactory results.
- D. F.I.T.T. – There are four components to cardiovascular prescription.
  - 1. Frequency – how often.\*\*
  - 2. Intensity – how hard.\*\*
  - 3. Time (duration) – how long.\*\*
  - 4. Type (mode) – what kind of activity.

**P. O. 8.3.11.2**

**INSTRUCTOR NOTE:** do not attempt to increase more than two components at a time. For example: if the

*subject is training at 60%, 30 mins, 4 times a week, then increase either intensity and duration or duration and frequency, etc. Do not increase all three.*

E. Three criteria for aerobic activity. (What energy system is used in aerobic activity?)

1. Utilize large muscle groups.
2. Utilize large amounts of oxygen.
3. Perform continuously.

F. Calculate heart rate – Karvonen Method.

**P. O. 8.3.11.3**

1. Subtract your age from “220”. (max HR). (Show example on the board.)
2. Take your max HR and subtract your resting HR and then multiply by 60%.
3. Add your resting HR back in and this is your target heart rate at 60%.
4. Redo this formula for 80% to give you a target range between 60% and 80%.

G. Measure target heart rate during exercise.

1. Warm up. Do not confuse this with 3- minute step test which measures heart rate recovery.)
2. Proceed with conditioning period.
3. At the level of perceived intensity stop and locate the pulse on the wrist or neck.
4. Count beats for 10 seconds.
5. Multiply by 6.

**INSTRUCTOR NOTE:** *Although there are many cardiovascular modes, we will focus on running because it is the most popular and practical mode for group exercise when in a law enforcement training environment.*

**III. RUNNING BIOMECHANICS**

**P. O. 8.3.11.7**

A. Running efficiency or inefficiency are due to the biomechanics listed below.

B. Pronation:

**P. O. 8.3.11.4**

1. The foot rolls inward.

2. The anatomical term is eversion. Over pronation causes the foot to roll too far inward.
- C. Supination: (High arches do not provide enough cushioning.)
1. The foot rolls out.
  2. The anatomical term is inversion.
- D. Foot strike:
1. The heel lightly strikes the ground then propels off the ball of the foot. Land quietly; do not slap the ground with your foot.
  2. Some tend to land too heavy or land on their toes.
- E. Stride length: **P. O. 8.3.11.5**
1. The distance between the propulsion and the landing. Think pushing forward with your rear foot, not reaching out with your front foot.
  2. Sometimes confused with “over-striding.”
- F. Stride frequency:
1. Leg turnover.
  2. Should be 180-190 steps per minute for maximum efficiency. Imagine running on a hot sidewalk or hot coals.
- G. Arm drive:
1. The arms dictate stride frequency. Think quick arms.
  2. Keeps arms at 90°.
  3. The hands should be slightly cupped (imagine cupping a butterfly).
- H. Posture:
1. “Stand tall,” but not rigid.
  2. A slumped posture restricts lung capacity.
  3. When landing, the hips should be above the landing foot.

- I. Breathing:
  - 1. Breathe from the “belly” not the “chest.”
  - 2. As endurance improves so does oxygen uptake.
  - 3. Recovery will also improve with training.

**IV. MAXIMIZE PERFORMANCE AND PREVENT INJURIES**

**P. O. 8.3.11.6**

- A. Three (3) common causes of running injuries:
  - 1. Lack of stretching.
  - 2. Over- or under-training.
  - 3. Improper shoes or equipment.
- B. Ways to maximize performance:
  - 1. Increase flexibility and strength.
  - 2. Training programs or goals.
  - 3. Knowledge of equipment and shoes.

**V. SELECTING THE PROPER RUNNING SHOES**

- A. Reasons:
  - 1. To avoid injury.
  - 2. To avoid unnecessary soreness.
  - 3. To maximize performance.
- B. There are three (3) foot types – a wet test can determine foot type. With wet feet, step on a surface that will retain your footprint.
  - 1. Neutral or normal arches – a natural cutout on the medial side of the foot between the forefoot and heel indicates the arch provides appropriate support.
  - 2. High or rigid arches – the cutout between the forefoot and heel is separated by a gap, indicating that the arch does not provide shock absorption upon the weight of the subject.

3. Flat or collapsed arches – the natural cutout does not exist or is minimal indicating that the arch fully collapses or flattens upon the weight of the subject.

C. Five (5) types of running shoes:

**P. O. 8.3.11.8**

1. Cushioned:

- a. Recommended for normal to rigid arches.
- b. Provides cushion and flexibility to help absorb shock.

2. Stability:

- a. Recommended for normal to flat-footed runners.
- b. Provides support in the arches to prevent over-pronation.
- c. Different levels of stability offered by manufacturers.

3. Motion control:

- a. Recommended for the severe overpronator or larger runner.
- b. Provides both medial and lateral support.

4. Racing shoe:

- a. Recommended for race day or optimal performance training.
- b. Not recommended for everyday training or running.

5. Trail shoe:

- a. Recommended for trail running.
- b. Provides cushion, support and a firmer outer sole to protect against stone bruises.

D. Shoe manufacturers:

1. Most shoe manufacturers make five (5) different running shoes.
2. Each manufacturer has a patented cushioning system. None is better than the other.

- a. Nike has air.
- b. Asics has gel.
- c. Adidas has adiprene.
- d. Brooks has hydraflow.
- e. New Balance has Absorb.

E. Considerations when purchasing running shoes:

- 1. Purchase shoes from someone knowledgeable (specialty running stores are ideal).
- 2. Purchase shoes in a larger size – approximately one-half ( $\frac{1}{2}$ ) to one (1) size larger.
- 3. Purchase shoes by fit, not name or price.
- 4. Purchase shoes after every 400 miles.

F. Other considerations:

- 1. Socks – avoid 100% cotton socks. Cool Max or a poly-blend will prevent blisters by whisking away moisture from the skin.
- 2. Running attire – the same as above. Cotton fibers tend to retain moisture against the skin and can cause discomfort by chafing.

**VI. PROPER TRAINING AND EQUIPMENT**

A. Train smart.

- 1. Proper warm-up and cool-down.
- 2. Rest days; listen to your body.
- 3. Do not start out too fast; set reasonable goals. Make it fun.

B. Proper equipment.

- 1. Check your shoes as you would the tires on your vehicle; replace when worn.
- 2. Do not use your feet as shoe trees.



**VII. CONCLUSION**

- A. Review of performance objectives.
- B. Final questions and answers.
- C. Instructor closing comment(s).