

# **Stronger Legs & Lower Body**

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## *Stronger Legs & Lower Body* Course Objectives

**After completing the *Stronger Legs & Lower Body* Pain course, the participant will:**

1. Understand how the muscles of the lower body work together to create a stable base of support
2. Learn the concept of agonist and antagonist as it pertains to the lower body.
3. Learn the anatomy, location and function of the Quadriceps muscles and ways to target them.
4. Learn the anatomy, location and function of the Hamstrings and ways to target them.
5. Learn the anatomy, location and function of the muscles of the lower leg, including the Gastrocnemius, Soleus, and Tibialis Anterior, and ways to target them.
6. Learn the anatomy and function of the Hip Musculature, including the Gluteus Maximus, Medius, and Minimus, the hip rotators, abductors and adductors, and ways to target them.
7. Understand the principle of overload and how to apply it to weight training.
8. Understand the concept of specificity and how it affects exercise results.
9. Understand how intensity is measured and how it affects results.
10. Understand how to modulate exercise volume, duration, and frequency based on exercise goals.
11. Understand the concept of overtraining, how it occurs, and what are the symptoms to watch for.
12. Learn the importance of proper form and technique for results and safety, including posture, joint movements, foot placement, tempo, and breathing.
13. Learn the concept of periodization and how to apply it to an exercise program.
14. Learn the number of reps and sets as well as rest periods to achieve muscular strength, muscular size, and muscular endurance.
15. Learn how to put a training program together with different split designs, including a whole-body split program and a two, three, and four day split program.
16. Understand the benefits and uses of free-weight exercises, machine-based exercises, unilateral and bilateral exercises, and compound versus isolation exercises, as well as the appropriate exercise order.
17. Learn the placement, correct positioning, execution, variations, and coaching points for a variety of exercises for all of the muscles of the lower body.
18. Understand the importance of explosive power and learn the correct mechanics for a variety of power exercises.
19. Learn and review how to modulate training variables for building mass and strength.
20. Learn how to use unilateral training to correct muscular imbalances and prevent injury.
21. Learn how strength training is applied for athletes and endurance activities.



*Stronger Legs & Lower Body*  
Course Examination

**Multiple Choice:** For each of the following questions, circle the letter of the answer that best answers the question.

1. The muscles responsible for moving a body part that contract during an exercise is called:
  - A. The agonist.
  - B. The antagonist.
  - C. The protagonist.
  - D. The stabilizer.
2. The front squat produces movement at all of the following joints except the:
  - A. Ankles.
  - B. Knees.
  - C. Hips.
  - D. Lumbar spine.
3. Which of the following is not one of the four muscles of the quadriceps?
  - A. Rectus femoris
  - B. Iliopsoas
  - C. Vastus medialis
  - D. Vastus lateralis
4. What is the main function of the quadriceps?
  - A. Flex the knee
  - B. Extend the knee
  - C. Flex the hip
  - D. Extend the hip
5. Which of the following modifications will help target the vastus lateralis?
  - A. Squats with a wide stance and toes turned out slightly
  - B. Leg extensions with the toes turned out slightly
  - C. Front squat with a narrow stance
  - D. Supine isometric leg raises
6. Which of the following is not one of the muscles of the hamstrings?
  - A. Rectus femoris
  - B. Biceps femoris
  - C. Semitendinosus
  - D. Semimembranosus

7. Which of the following is not a function of the hamstrings?
- A. Knee flexion
  - B. Antagonist of the quadriceps
  - C. Hip extension
  - D. Hip flexion
8. Which of the following is not an exercise for the hamstrings?
- A. Machine leg curls
  - B. Exercise ball leg curls
  - C. Straight leg deadlifts
  - D. Leg raises
9. Which of the following exercise modifications will more effectively target the upper hamstrings?
- A. Leg curls with the feet turned out
  - B. Leg curls with the feet turned in
  - C. Performing bent knee Romanian deadlifts
  - D. Performing stiff-leg deadlifts
10. What is the joint action of the gastrocnemius and soleus?
- A. Plantar flexion
  - B. Plantar extension
  - C. Dorsiflexion
  - D. Ankle inversion
11. What tendon attaches the gastrocnemius and soleus to the heel?
- A. Patellar tendon
  - B. Achilles tendon
  - C. Quadriceps tendon
  - D. Linea alba
12. Which of the following exercises will not target the gastrocnemius?
- A. Leg-press calf raise
  - B. Standing calf raise
  - C. Machine standing calf raise
  - D. Seated calf raise
13. What muscle is the antagonist of the gastrocnemius and soleus?
- A. Semimembranosus
  - B. Vastus lateralis
  - C. Tibialis anterior
  - D. Semitendinosus
14. The gluteal muscles work together to perform all of the following joint actions except:
- A. Flex the upper leg.
  - B. Extend the upper leg.
  - C. Rotate the upper leg.
  - D. Abduct the upper leg.

15. How many muscles make up the thigh adductors?
- A. 2
  - B. 3
  - C. 4
  - D. 5
16. Which of the following is not a gluteal muscle?
- A. Gluteus maximus
  - B. Gluteus medius
  - C. Gluteus intermedius
  - D. Gluteus minimus
17. What is the joint action of the tensor fasciae latae?
- A. Knee extension
  - B. Thigh adduction
  - C. Thigh abduction
  - D. Hip extension
18. Which of the following is not a lateral rotator of the thigh?
- A. Piriformis
  - B. Gracilis
  - C. Gemellus superior
  - D. Obturator externus
19. All of the following exercises target the muscles of the hip and thigh as a whole except:
- A. Leg extensions
  - B. Squats
  - C. Step-ups
  - D. Lunges
20. What is the definition of overload?
- A. Neurological adaptation that occurs with free weight training.
  - B. Providing a stimulus that is above normal to trigger adaptation.
  - C. Training for a skill by doing that skill.
  - D. The amount of work that is performed during a training session.
21. Which of the following is not a way to accomplish overload?
- A. Increasing the amount of weight used
  - B. Increasing the number of exercised performed
  - C. Increasing the training intensity
  - D. Increasing the rest periods
22. What does it mean to train at full intensity?
- A. Running long distances to train for a marathon.
  - B. Doing general exercises to build a base of strength
  - C. Lifting the heaviest weight possible as many times as possible to the point of muscle failure.
  - D. Progressively lifting more weight over time to continue to improve results.

23. What is the definition of training volume?
- A. The amount of work that is performed during a training session.
  - B. The number of reps done during each set.
  - C. The number of sets of each exercise that is performed.
  - D. The percentage of 1RM that is achieved.
24. About how often should a strength-training program be changed?
- A. Every workout
  - B. Every week
  - C. Every 6 weeks
  - D. Every 4 months
25. If you are doing a whole body strength-training workout, how many days rest should you at least have before repeating the workout?
- A. 2 days
  - B. 3 days
  - C. 4 days
  - D. It is not necessary to take a day off.
26. Which of the following is not a sign of overtraining?
- A. Fatigue
  - B. Increased appetite
  - C. Increased muscle soreness
  - D. Increased resting heart rate.
27. During which portion of an exercise is the muscle shortening?
- A. Eccentric phase
  - B. Negative phase
  - C. Isometric phase
  - D. Concentric phase
28. Which phase of the periodization cycle builds the base of strength for the subsequent phases and involves moderate to high volume with moderate intensity?
- A. Preparation phase
  - B. Strength-building phase
  - C. Strength and power phase
  - D. Maintenance phase.
29. What is the rep range for increasing muscle size?
- A. 1 to 3
  - B. 3 to 6
  - C. 8 to 12
  - D. 15 to 20

30. How long should your rest period be between sets when you are training for strength?
- A. 30 seconds
  - B. 1 minute
  - C. 90 seconds
  - D. 2 to 5 min.
31. How many times per week should a whole-body split routine be done?
- A. 1 time per week
  - B. 2 times per week
  - C. 3 times per week
  - D. 5 times per week
32. How many times will each body part be worked per week in a three-day split routine?
- A. 1 to 2 times per week
  - B. 2 to 3 times per week
  - C. 3 to 4 times per week
  - D. 4 to 5 times per week
33. Which of the following types of exercise involves multiple joints throughout the movement?
- A. Free weight exercises
  - B. Compound exercises
  - C. Machine exercises
  - D. Isolation exercises
34. Which of the following statements is true regarding compound exercises?
- A. Compound exercises should be done before isolation exercises.
  - B. Isolation exercises should be done before isolation exercises.
  - C. Compound exercises generally involve lighter loads than isolation exercises.
  - D. Muscles should be fatigued with isolation exercises before performing compound lifts.
35. Which of the following joint actions should not occur during a body-weight squat?
- A. Back flexion
  - B. Hip flexion
  - C. Knee flexion
  - D. Ankle flexion
36. When doing a dumbbell squat, holding the weights up on your shoulders will mimic a front squat and increase recruitment of which muscle group?
- A. Glutes
  - B. Hamstrings
  - C. Quads
  - D. Core



37. Which of the following is not correct regarding the starting position or execution of a Smith Press Squat?
- A. The bar of the Smith machine is placed across the upper back.
  - B. Hands are equidistant from each end of the bar.
  - C. Feet are placed behind the midline of the body.
  - Squat down until quads are about parallel with the body.
38. Which of the following muscles is not targeted during a walking lunge?
- A. Glutes
  - B. Hip flexors
  - C. Quads
  - D. Core
39. When doing a Bench single-leg squat, how high should the bench be that the back foot is placed on?
- A. 5 to 10 inches
  - B. 10 to 18 inches
  - C. 22 to 24 inches
  - D. 36 inches
40. When during the workout should the single-leg press on the leg press machine be completed?
- A. During the warm-up
  - B. Beginning of the workout
  - C. Middle of the workout
  - D. End of the workout
41. When performing an ankle-weight standing hip extension, how far back should you extend the foot behind you?
- A. 4 to 6 inches
  - B. 12 to 24 inches
  - C. 30 to 42 inches
  - D. As far back as it takes to create hyperextension in the lower back.
42. Which of the following statements regarding the Exercise-ball lying hip extension is not correct?
- A. Exercise ball should be placed under the waist.
  - B. Starting position is with arms straight in a push-up position.
  - C. Keep legs straight and feet a few inches apart.
  - D. Placing the ball on a bench decreases the range of motion.
43. When during the workout should a single-leg bridge be performed?
- A. During an active warm-up
  - B. Beginning of the workout
  - C. Middle of the workout
  - D. Late in the workout

44. The Sled push works all of the following muscles except:
- A. The rectus abdominus.
  - B. The glutes.
  - C. The hamstrings.
  - D. The low back.
45. Which of the following is not correct regarding the technique of the resistance-band hip extension exercise?
- A. Start by lying on your back with the resistance band securely around the foot or ankle.
  - B. Secure the band to an object about 5 feet off the ground.
  - C. Head should be facing away from the resistance band attachment.
  - D. Keep the non-working leg bent and foot flat on the floor.
46. What is the main function of the quadriceps muscle?
- A. Plantarflexion of the ankle
  - B. Knee flexion
  - C. Knee extension
  - D. Hip rotation
47. When doing a loaded barbell squat, across which muscle should the bar be placed?
- A. Levator Scapulae
  - B. Upper Traps
  - C. Lower Traps
  - D. Rhomboids
48. Which of the following is incorrect regarding the technique of an exercise-ball squat?
- A. Stand about 2 to 3 feet from a wall.
  - B. Feet should be slightly wider than shoulder width.
  - C. Ball should be placed between the wall and the upper back.
  - D. While squatting, keep the back straight.
49. Which of the following muscles are targeted during a single-leg squat?
- A. Quads
  - B. Glutes
  - C. Hamstrings
  - D. Hip flexors
50. When during a workout should you perform the weighted-sled walking lunge?
- A. Early in the workout
  - B. Middle of the workout
  - C. Late in the workout
  - D. During an active cool-down
51. Which of the following is not correct regarding the technique of a walking retro lunge?
- A. Start standing upright with hands on hips.
  - B. Step forward with one foot by flexing your hip and extending your knee.
  - C. At the midpoint of the exercise, the front leg should be flexed with the knee at 90 degrees.
  - D. Drive backward by extending your front knee and hip back to the start position.

52. Which of the following muscles is not targeted during the slide lateral lunge?
- A. Erector spinae
  - B. Quads
  - C. Glutes
  - D. Adductors
53. When during the workout should a straight-leg step-down be done?
- A. During dynamic warm-up
  - B. Beginning of workout
  - C. Middle of workout
  - D. End of workout
54. Which of the following muscles is targeted during a machine leg extension?
- A. Hamstrings
  - B. Glutes
  - C. Abductors
  - D. Quads
55. Besides the quads, which muscle is targeted during the functional trainer straight-leg hip flexion?
- A. Hamstrings
  - B. Hip flexors
  - C. Abductors
  - D. Adductors
56. When during the workout should the single-leg extension exercise be completed?
- A. Beginning of the workout
  - B. Middle of the workout
  - C. End of the workout
  - D. During the cool-down
57. Where are the hamstring muscles located?
- A. Posterior thigh
  - B. Anterior thigh
  - C. Medial thigh
  - D. Lateral thigh
58. All of the following muscles are worked during a trap-bar squat except:
- A. Hamstrings
  - B. Glutes
  - C. Quads
  - D. Traps
59. Which of the following statements regarding the technique for good mornings is incorrect?
- A. This exercise should be done early in the workout.
  - B. Feet should be about 8 inches wider than hip-width apart.
  - C. Bar should be placed across upper traps and shoulders.
  - D. Head should remain in neutral position throughout the exercise.

60. Which of the following statements regarding technique for the prone leg curl is incorrect?
- A. This exercise should be done in the middle of the workout.
  - B. Lie prone on the bench with your knees right off the end of the bench.
  - C. Flex legs and raise the pad toward the glutes.
  - D. Raise the bar until hips are lifted off the bench.
61. Which of the following muscles is not worked in the Hamstring Lower exercise?
- A. Hamstrings
  - B. Glutes
  - C. Quads
  - D. Calves
62. When during the workout should the Double-Leg Flexed-Leg Bridge be performed?
- A. During the warm-up
  - B. Beginning of the workout
  - C. Middle of the workout
  - D. Late in the workout
63. Which of the following statements regarding the technique for the Roman Chair Hip Extension exercise is incorrect?
- A. When lying prone on the chair with the pads resting on the mid-thigh
  - B. Place arms across your chest.
  - C. Extend upwards by contracting the low back, glutes, and hamstrings.
  - D. Raise until spine is in neutral position.
64. When during a workout should a manual-resistance prone leg curl be performed?
- A. Beginning of the workout
  - B. Middle of the workout
  - C. Late in the workout
  - D. It doesn't matter, just when a partner is available.
65. Which of the following statements regarding the exercise-ball supine leg curl is correct?
- A. This exercise targets the hip flexors, quadriceps, and tibialis anterior.
  - B. This exercise should be performed early in the workout.
  - C. Starting position is lying on your back with your knees resting on the ball.
  - D. While your hips are raised off the floor, bring the heels in toward the glutes.
66. What muscle is the antagonist of the gastrocnemius and soleus?
- A. Hamstrings
  - B. Tibialis Anterior
  - C. Peroneals
  - D. Piriformis
67. What is the muscle targeted during a Leg-Sled Calf Raise?
- A. Soleus
  - B. Tibialis Anterior
  - C. Gastrocnemius
  - D. Piriformis

68. Which of the following statements regarding the technique for a Functional-Trainer Standing Calf Raise is incorrect?
- A. Perform this exercise early in the workout.
  - B. Stand with the ball of one foot on the edge of a 6-inch step.
  - C. Hold the weight from the functional trainer in the opposite hand.
  - D. Plantar flex up onto the ball of your foot, hold for one second, and return to the starting position.
69. What muscle is primarily targeted with the seated calf raise?
- A. Gastrocnemius
  - B. Soleus
  - C. Tibialis Anterior
  - D. Peroneals
70. Which of the following statements regarding the technique for a Functional-Trainer dorsiflexion is incorrect?
- A. This should be performed late in the workout.
  - B. A strap attached to the machine should be securely strapped around the foot.
  - C. Begin with the foot dorsiflexed and then plantar flex toward the machine
  - D. Ensure that movement is only occurring at the ankle joint.
71. When should the weight-plated seated dorsiflexion be done during the workout?
- A. As a warm-up prior to cardio activities
  - B. Early in the workout
  - C. Middle of the workout
  - D. Late in the workout
72. Which of the following regarding the heel walk is incorrect?
- A. This exercise targets the gastrocnemius.
  - B. This exercise should be done late in the workout.
  - C. Stand on your heels with your toes pointed up.
  - D. This exercise can be done on the floor or a treadmill.
73. What is the definition of power?
- A. How many times a weight can be moved before the muscle fatigues.
  - B. How much weight can be lifted in one maximal lift.
  - C. The rate at which work is done.
  - D. Rapid changes in direction and speed.
74. Which phase of the power clean consists of driving the hips forward and moving the body weight more toward the front of the feet?
- A. Initial Pull
  - B. Transition phase
  - C. Final Pull
  - D. Catch phase

75. During the catch phase of the power clean, the bar should be caught in line with which muscle?
- A. Biceps
  - B. Anterior deltoids
  - C. Posterior deltoids
  - D. Triceps
76. Which of the following is not a muscle targeted during the Hang Clean?
- A. Glutes
  - B. Quads
  - C. Traps
  - D. Triceps
77. Which phase of the Hang Clean is characterized by an explosive extension of the ankles, knees, and hips?
- A. Pull phase
  - B. Scoop phase
  - C. Transition phase
  - D. Catch phase
78. Which phase of the Power Snatch is characterized by explosive extension of the ankles, knees, and hips?
- A. Initial Pull
  - B. Scoop phase
  - C. Transition phase
  - D. Final Pull
79. When during a workout should the Power Jerk be completed?
- A. Early in the workout
  - B. Middle of the workout
  - C. Late in the workout
  - D. Whenever you would like.
80. Which of the following statements regarding the Squat Jump is incorrect?
- A. Stand with a wide stance with feet wider than shoulder-width apart.
  - B. Keep back and head in a neutral position.
  - C. Descend into the squat until quads are parallel to the ground.
  - D. Land softly while simultaneously flexing the ankles, knees and hips.
81. Which of the following is not a muscle targeted during a split squat jump?
- A. Glutes
  - B. Quads
  - C. Erector spinae
  - D. Gastrocnemius

82. Which of the following statements regarding the Broad Jump is incorrect?
- A. This exercise targets the glutes, quads, hamstrings, gastrocnemius, and soleus.
  - B. This exercise should be done during a dynamic warm-up
  - C. Feet should be placed shoulder-width apart.
  - D. The exercise is performed by forcefully extending the ankles, knees, and hips while swinging the arms forward.
83. Which of the following is the correct way to land from the Broad Jump?
- A. Land with weight in the heels.
  - B. Land with weight in the toes.
  - C. Land with weight dispersed evenly throughout both feet.
  - D. Land with legs straight.
84. In the starting position of the Single-Leg Triple Jump, the weight should be placed under which part of the foot.
- A. The heel of the foot
  - B. The ball of the foot
  - C. Evenly distributed across the foot
  - D. Whichever part of the foot feels most comfortable.
85. When performing the Bench Single-Leg Bounds, how high should the bench or box be?
- A. 4 to 8 inches
  - B. 12 to 16 inches
  - C. 2 feet
  - D. 3 feet
86. Which of the following statements regarding the technique for the Bench Single-Leg Bound is incorrect?
- A. This exercise should be completed at the end of the workout.
  - B. When starting, one foot should be on the bench, and the leg that is on the floor should have a slight bend.
  - C. Forcefully extend the ankles, knees, and hips in an upward movement and swing the arms forward.
  - D. The foot on the bench should remain on the bench at all times.
87. What is the minimum number of exercises that should be done per body part or muscle group for gaining mass?
- A. 2 to 3
  - B. 3 to 4
  - C. 4 to 6
  - D. 6 to 8
88. What is the optimum number of reps for mass building?
- A. 1 to 3
  - B. 2 to 5
  - C. 8 to 12
  - D. 15 to 20

89. Which type of exercises are better at correcting muscular imbalances and preventing injury?
- A. Bilateral exercises.
  - B. Unilateral exercises
  - C. Machine exercises
  - D. Power exercises.
90. When training for sports, which type of training is most beneficial for sports performance?
- A. Periodization training
  - B. Strength training
  - C. Hypertrophy training
  - D. Endurance training
91. Which of the following statements regarding endurance training is incorrect?
- A. Endurance sports rely mostly on repetitive aerobic movements.
  - B. Endurance sports require training slow-twitch muscle fibers.
  - C. Strength training is not important for endurance athletes
  - D. The body goes through stages of muscle recruitment dependent upon the demands placed upon it.
92. Which plane of the body divides it into right and left halves?
- A. Frontal plane
  - B. Coronal plane
  - C. Transverse plane
  - D. Sagittal plane
93. Which plane divides the body into top and bottom halves?
- A. Frontal plane
  - B. Coronal plane
  - C. Transverse plane
  - D. Sagittal plane
94. Which of the following describes or is an open-chain exercise?
- A. Exercises where the distal end of an extremity is in a fixed position.
  - B. Exercises where the distal end of an extremity is not in a fixed position.
  - C. Lunges
  - D. Squats
95. What is the formula for strength?
- A. Mass times distance
  - B. Sets times Reps
  - C. Mass divided by reps
  - D. Work divided by time
96. What is the formula for power?
- A. Mass times distance
  - B. Sets times speed
  - C. Mass divided by reps
  - D. Work divided by time



97. How can you work on power development while doing traditional weightlifting exercises?
- A. Increase the weight
  - B. Decrease the weight
  - C. Increase the speed
  - D. Decrease the speed
98. Athletes who want to increase their first-step quickness, vertical jump, and overall power for sports would do which type of training?
- A. Strength training
  - B. Hypertrophy training
  - C. Endurance training
  - D. Plyometric training
99. Plyometric training assists with developing which energy system?
- A. Aerobic system
  - B. Glycogen system
  - C. Creatine phosphate system
  - D. Gluconeogenesis system
100. Complex training is a combination of which two types of training?
- A. High-intensity strength training followed by a hypertrophy exercise.
  - B. High-intensity strength training followed by an endurance exercise.
  - C. High-intensity strength training followed by a plyometric exercise.
  - D. Low-intensity strength training followed by a plyometric exercise.
-