I. Bones and Bony Landmarks of the Ankle and Foot

1. Bones of the Ankle Joint
2. Tibia
3. Fibula
4. Talus
5. Bones of the Foot (figure 6.1 page 202)
6. 7 Tarsals:
7. 5 Metatarsals
8. 14 Phalanges
   1. Hallux (toe 1 or great toe) contains:
   2. Lesser toes (toes 2-5) contain:
9. 2 Sesamoids (under hallux)
10. Bony Landmarks of the Ankle and Foot
11. Tibia:
12. Fibula:
13. Tarsals:
14. Metatarsals:
15. Phalanges:
16. Segments of the Foot (figure 6.2A, page 203)
17. Rearfoot:
18. Midfoot:
19. Forefoot:

II. Joint Structure and Movements of the Ankle and Foot  
(See figures 6.3 and 6.4, pages 205 and 206; know table 6.1, page 204.)

1. Tibiofibular Joints
2. Articulating bones:
3. Technical names of joints:
4. Although not anatomically part of the ankle-foot complex, the tibiofibular joints are vital for proper function of the ankle joint.
5. Movement Terminology for the Ankle and Foot
6. Movements: plantar flexion-dorsiflexion, inversion-eversion, abduction-adduction, flexion-extension  
   (Figure 6.4, page 206—Know the joint movements and be able to identify these movements on a similar figure or from movement descriptions that will be used for the test.)
7. Ankle Joint Classification and Movements
8. Articulating bones:
9. Technical name:
10. Type of joint:
11. Movements:
12. Subtalar Joint Classification and Movements
13. Articulating bones:
14. Type of joint:
15. Movements:
16. Ankle Joint Capsule and Rearfoot Ligaments
17. Ankle joint capsule: Thin
18. Rearfoot ligaments
    1. Medial collateral, or deltoid (figure 6.5, page 207)
19. Provides:
20. Lateral collateral (figure 6.6, page 207)
21. Provides:
22. The most commonly sprained ligament is the:
23. Transverse Tarsal Joint Classification and Movements
24. Two joints that comprise the transverse tarsal or midtarsal joint:
    1. Talonavicular  
       Articulating bones:  
       Type of joint:
    2. Calcaneocuboid  
       Articulating bones:  
       Type of joint:
25. Movements of the transverse tarsal joint:
26. Classification and Movements of Other Key Joints of the Midfoot and Forefoot
27. Metatarsophalangeal joints
28. Articulating bones:
29. Type of joint:
30. Movements:
31. Interphalangeal joints
32. Articulating bones:
33. Type of joint:
34. Movements:
35. The Composite Movements of Pronation and Supination
36. Pronation: Ankle–foot dorsiflexion and eversion; forefoot abduction in open kinematic chain conditions
37. Supination: Ankle–foot plantar flexion and inversion; forefoot adduction in open kinematic chain conditions
38. Special Structures of the Ankle and Foot (figures 6.10 and 6.11, pages 210 and 211)
39. Arches of the foot (figure 6.7, page 208; figure 6.28, page 227)
40. Medial longitudinal arch
41. Longitudinal arches responsible for:
42. Medial is highest longitudinal arch
43. Produces central concavity of foot
44. Function:
45. Transverse arches
46. Responsible for:
47. Plantar fascia (figures 6.8 and 6.9, page 209)
48. Description:
49. Function:
50. Retinaculum (figure 6.10, page 210)
51. Description:
52. Function:
53. Tendon sheaths (figure 6.10, page 210
54. Description:
55. Function:
56. Heel pad (figure 1.7, page 12)
57. Description:
58. Function:
59. Sesamoids (figure 6.2A, page 203)
60. Description:
61. Function:
62. Bursae (figure 6.11, page 211)
63. Description:
64. Function:

III. Description and Functions of Individual Muscles of the Ankle and Foot

1. Individual Extrinsic Muscles of the Ankle and Foot and Their Actions—Muscles whose distal attachments are in the foot, but otherwise lie outside the foot (required learning for this course).
2. Anterior crural muscles (Common action is ankle–foot dorsiflexion.)
   1. Tibialis anterior (figure 6.12, page 212)  
      Actions:
   2. Extensor hallucis longus (figure 6.13, page 213)  
      Actions:
   3. Extensor digitorum longus (figure 6.14, page 214)  
      Actions:
   4. Peroneus tertius—Not required for this course.
3. Posterior crural muscles (Common action is ankle–foot plantar flexion.)
   1. Gastrocnemius (figure 6.15, page 215)  
      Action:
   2. Soleus (figure 6.16, page 216)  
      Action:  
      Common attachment with gastrocnemius via Achilles tendon
4. Posteromedial crural muscles (Common actions are ankle–foot plantar flexion and foot inversion)
   1. Tibialis posterior (figure 6.17, page 217)  
      Actions:
   2. Flexor hallucis longus (figure 6.18, page 218)  
      Actions:
   3. Flexor digitorum longus (figure 6.19, page 219)  
      Actions:
5. Lateral crural muscles (Common actions are ankle–foot plantar flexion and foot eversion.)
6. Peroneus longus (figure 6.21, page 220)  
   Actions:
7. Peroneus brevis  
   Actions:
8. Summary of Extrinsic Ankle–Foot Muscle Locations and Actions
9. Muscle names and actions—Know the names, general locations (i.e., anterior, posterior, posteromedial or lateral), and actions of the muscles in table 6.2, page 221.
10. Muscle names and specific location—Know the names and locations of the muscles shown in figure 6.22 (A only), page 222; figure 6.23 (A only), page 223; and figure 6.24 (A only), page 224. Similar figures will be on the test, and you will be asked to identify muscles that have arrows pointing to them.
11. Intrinsic Muscles of the Ankle and Foot (figures 6.25 and 6.26, pages 224 and 225)—Muscles that have all attachments within the foot (not required to learn for this course).

IV. Alignment and Common Deviations of the Ankle and Foot

1. Tibial Torsion (figure 6.27, page 226)
   1. Definition:
   2. The average person has about 15° external rotation, which allows dancers to turn out somewhat farther with the feet than with the hip without undue stress to the knees.
2. Arches of the Feet (figure 6.28, page 227, Tests and Measurements 6.1, page 229)
   1. Normal medial longitudinal arch
      1. Landmarks:
   2. Pes planus
      1. Definition:
      2. Rigid or structural flat foot landmarks:
      3. Flexible or functional flat foot landmarks:
   3. Pes cavus
      1. Definition:
3. Position of the Toes
   1. Claw toes (figure 6.31, page 229)  
      Description:
   2. Hallux valgus and bunions (figure 6.32, page 230)—A lateral deviation of the hallux can lead to bony and soft tissue enlargement on the medial side of the first metatarsal head termed a bunion

V. Mechanics of the Ankle and Foot

1. Weight Distribution, or Placement, During Standing (figure 6.33, page 231)—
2. Influence of Ankle Dorsiflexion and Plantar Flexion on Stability (figure 6.34, page 231)
3. Decreased ankle stability during plantar flexion is due to:
4. Influence of Pronation and Supination on Foot Mechanics
5. Supination favors:
6. Pronation favors:

VI. Muscular Analysis of Movements of the Ankle and Foot

1. Ankle–Foot Plantar Flexion
2. Plane and axis: Sagittal plane, mediolateral axis
3. Primary muscles:
4. Examples of movements involving the concentric use of the ankle–foot plantar flexors
   * 1. Strength exercises:
     2. Dance:
5. Sample movement analysis: Parallel first-position jump (table 6.4, page 233)
6. Ankle–Foot Dorsiflexion
7. Plane and axis: Sagittal plane, mediolateral axis
8. Primary muscles:
9. Examples of movements involving the concentric use of the ankle–foot dorsiflexors
   * 1. Strength exercise:
     2. Dance:
10. Foot Inversion
11. Primary muscles:
12. Examples of movements involving the concentric use of the ankle–foot invertors
13. Strength exercise:
14. Dance:
15. Foot Eversion
16. Primary muscles:
17. Examples of movements involving the concentric use of the ankle–foot evertors
18. Strength exercise:
19. Dance:
20. Analysis of Stretches for the Ankle–Foot  
    (Table 6.6, page 237—Be able to match the muscle group stretched with a picture or the name of the exercises in this table.)
21. Examples of ankle–foot stretches
22. Ankle–foot plantar flexors:
23. Ankle–foot dorsiflexors:

VII. Key Considerations for the Ankle and Foot in Whole-Body Movement

1. Foot Pronation and Supination in Walking (Concept Demonstration 6.1A, page 239, and lab)
   1. Phases of gait: Swing and stance
   2. Subdivision of stance phase: Contact period, midstance period, and propulsive period
   3. Position of foot during stance phase
2. Initial slight supinated position in contact period for stability
3. Immediately followed by pronation for shock absorption, a mobile adaption that persists into the beginning of the midstance period
4. Supinated position in propulsive period to allow the foot to act as a rigid lever
5. Excessive Pronation—
6. Coupling of the Leg and Foot (figure 6.39, page 238)
   1. Coupling of internal tibial, or lower-leg, rotation with:
   2. Coupling of external tibial, or lower-leg, rotation with:

VIII. Special Considerations for the Ankle and Foot in Dance

* 1. Demi-Pointe, Pointe, and the Stirrup Muscles (Concept Demonstration 6.2, page 241)

1. Muscular components
2. Tibialis anterior  
   Component of stirrup muscle:  
   Cue:
3. Tibialis posterior  
   Component of stirrup muscle:  
   Cue:
4. Peroneus longus and brevis  
   Component of stirrup muscle:  
   Cue:
5. Pointing the Foot in Open Kinematic Chain Movements (Concept Demonstration 6.2, page 241)
6. Muscular components
7. The gastrocnemius and soleus are key for ankle plantar flexion.
8. The tibialis posterior and the peroneal muscles of the stirrup muscles as well as other muscles can add additional movement from the midfoot and forefoot to optimize the point of the foot.
9. Cues:
10. Knee–Foot Alignment (Concept Demonstration 6.3, page 242):

IX. Ankle and Foot Injuries in Dancers

1. Prevention of Ankle–Foot Injuries
   * 1. Sound training principles
     2. Supplemental ankle–foot strength, flexibility, and proprioceptive exercises
     3. Good technique including using the stirrup muscles and maintaining adequate turnout from the hip
     4. Well-fitting shoes, when appropriate
     5. Floors with good resiliency and friction
2. Common Ankle and Foot Injuries in Dancers
   * 1. Ankle sprain (figure 6.40, page 243)  
        Structure:  
        Symptoms:
     2. Plantar fasciitis (figure 6.41, page 244)  
        Structure:  
        Symptoms:
     3. Achilles tendinopathy (figure 6.42, page 244)  
        Structure:  
        Symptom:
     4. Posterior impingement syndrome (figure 6.43, page 245)  
        Structure:  
        Symptom:
     5. Shin splints (tibial stress syndrome; figure 6.44, page 246)  
        Structure:  
        Symptoms:
     6. Stress fractures of the lower leg and foot (figure 6.45, page 246)  
        Structure:  
        Symptoms:
3. Rehabilitation of Ankle–Foot Injuries
   * 1. Restoration of normal range of motion, especially in ankle–foot plantar flexors
     2. Strengthening exercises that progress to include functional training
     3. Strong emphasis on proprioceptive exercises