

# **COURSE TITLE: Advanced Concepts in Motor Learning and Performance for Motor Skills Instructors**

**COURSE DESIGNER:** Robert Bragg

## **1. RATIONALE FOR COURSE:**

In order to ensure solid grounding in the precepts surrounding motor skill instructional methodology and to better prepare Master Instructors for delivering the “motor leaning” portion of various instructor courses this course will guide the student through the theoretical concepts developed from scientific research in the area of motor learning and performance

## **2. COURSE GOAL:**

The participant will learn and understand the accepted concepts and practices related to motor skills instruction.

## **3. TARGET AUDIENCE DESCRIPTION:**

While this course would benefit all individuals who train motor skills, this course is designed primarily for those who must instruct motor skills trainers and therefore must have achieved Master Instructor status.

The audience will range in age from approximately 25- 45. The education level ranges from high school diplomas to doctorate degrees. Due to their age and experience levels, most prefer to learn through hands-on activities and group discussions where they can conceptual information to their work experience. It is assumed that the percent of auditory, visual, and kinesthetic learners will be mixed.

## **4. COURSE DEPLOYMENT**

This course will be delivered partially through email communication. This portion of the training will be designed to test knowledge, comprehension that can be assessed by completion of written test. Participants will be complete all of the questions in order to enter the classroom portion.

## **5. COURSE STRATEGIES**

The general structure of the classroom portion will use lecture, discussion, and interactive group work to present the information. Class format will rely heavily on interactive discussion with questions designed to elicit responses that require the student to synthesize information from the text and apply it to their specific area of motor skill instruction. The program will be broken into units that include a variety of activities prescribed by the instructor, including readings, lectures, participation in group activities, and tests. The email-based structure allows for flexibility for busy LE/CO professionals.

## 6. COURSE OBJECTIVES

- The student will be required to purchase the text *Motor Learning and Performance* (Schmidt and Wrisberg) and successfully answer both the text questions and additional questions prior to acceptance into the 40 hour course.
- The student will deliver multiple 30 minute presentations on selected topics from the course text.

## 9. COURSE TABLE OF CONTENTS

### Unit 1 *Introduction to Motor Performance and Learning*

1. Motor Skill: What Is It? The Chicken and the Egg: Motor Performance and Motor Learning , A Problem-Based Approach to Motor Performance and Learning,
2. Individual Differences and Motor Abilities , Concept of Individual Differences, Abilities and Capabilities.

### Unit II: Principles of Human Skilled Performance

3. Processing Information and Making Decisions, Information-Processing Approach, Reaction Time and Decision Making, Decision Making and Performance Under Conditions of Arousal and Anxiety, Attention: Limitations in Information-Processing Capacity, Three Memory Systems,
4. Sensory Contributions to Skilled Performance, Sources of Sensory Information, Closed-Loop Control Systems, Reflexive Modulations in Movement Skills, Role of Two Visual Systems in Movement Control, Visual Control of Movement Skills
5. Movement Production and Motor Programs, Motor Program Theory, Open-Loop Control Within the Conceptual Model, Generalized Motor Programs
6. Principles of Motor Control and Movement Accuracy, Relative Timing, Determinants of Accuracy in Rapid Movements, Combining the Principles: A Batting Example

### Unit III: Principles of Skill Learning

7. Preparing for the Learning Experience, Defining the Learning Experience, The Learner, Assessing Progress,
8. Supplementing the Learning Experience, Preliminary Considerations, Skill Presentation Techniques, Forms of Rehearsal
9. Structuring the Learning Experience, Practicing Several Different Tasks, Practicing Several Versions of the Same Task, Random or Blocked Practice Versus Varied or Constant Practice, Combining Random and Varied Practice, Practicing for Consistent and Varied, Stimulus-Response Mapping
10. Providing Feedback During the Learning Experience, Classifying Feedback, Properties of Extrinsic Feedback, Practical Considerations When Providing, Information Feedback

## Unit IV: Integration and Applications

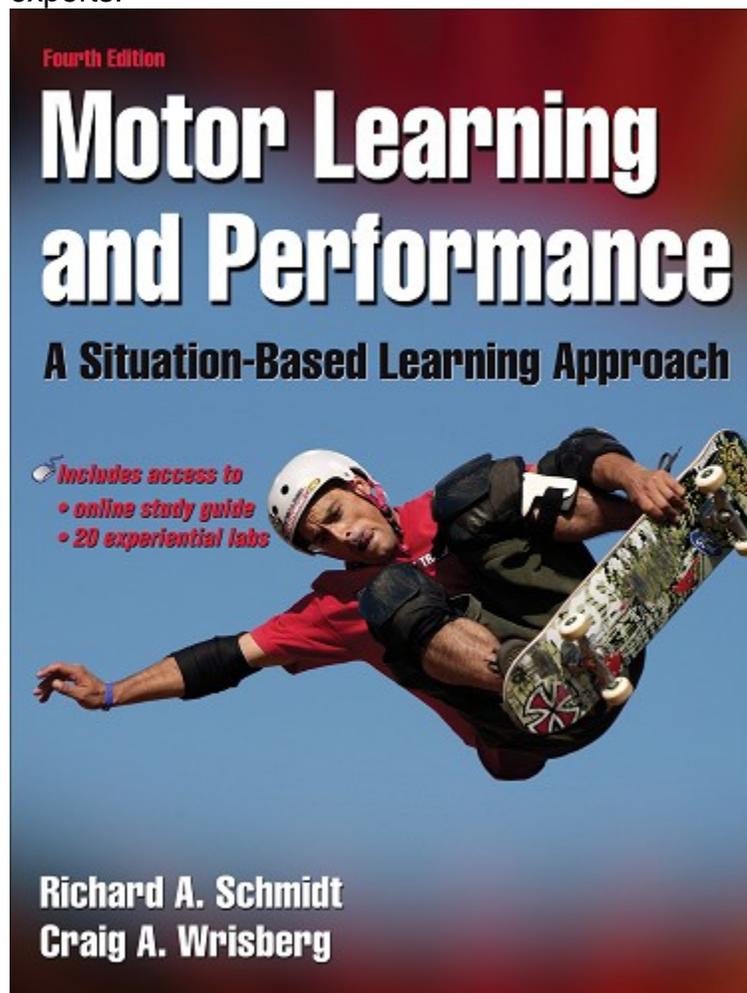
11. Facilitating Learning and Performance, A Working Strategy for Providing Instructional Assistance, Four Case Studies, Assessment of Learner Progress
12. From Principles to Practice; Applying the Principles of Skill Learning

### 7. COURSE SUPPLIES AND EQUIPMENT

Classroom, tables and chairs, Computer, LCD Projector, Flip Charts, access to copy machine.

### 8. COURSE TEXT

**Motor Learning and Performance-4th Edition:** an introductory textbook for courses in motor learning, motor performance, and motor behavior. Reference for movement practitioners, including coaches, physical education teachers, dance teachers, special education teachers, rehabilitation therapists, occupational therapists, physical therapists, athletic trainers, and human factors experts.



Schmidt, Richard A.  
Copyright 2004 ISBN: 073604566X  
Hardback 400 pages

## ACMLP - Distance Learning Course 4<sup>th</sup> edition

### Motor Learning and Performance Test questions

It is suggested to read the questions below and those in the text **BEFORE** you read each chapter. Provide answers in the space below the questions to eliminate restating the question.

1. Franklin M Henry is also known as the “father of motor skills research T-F
2. At what institution did Frank Henry perform most of his research?
3. One of his most important works was in the area of \_\_\_\_\_ .
4. *When defining a motor skill the text suggests that motor skills can be conceptualized 2 ways. They are then broken down further in each of these 2 categories. Describe those 2 categories.*
5. Describe the task organization continuum and give 3 examples of each related to Force training.
6. Why is the term psycho-motor skill or perceptual-motor skill applied to the above tasks?
7. Explain the concept of a motor-cognitive skill continuum.
8. Give examples of skills on both extremes and the middle point on this continuum.
9. When analyzing a skill for instruction, the 2 major components you should identify about the skill are what? –

10. Gentile's 2-dimensional classification system considers what 2 elements.
11. Diagram the 2 dimensional grid of Gentile's classification system.
12. Explain implicit learning.
13. The most amount of "problem solving" is in which stage of learning?
14. Describe the Motor learning continuum and the associated motor performance characteristics.
15. At which stage of motor learning is the learner able to detect and correct errors that might occur in their performance?
16. Relate the phenomenon of "choking" during performance to the intrinsic and extrinsic control process.
17. Define the basis or premise on which PBL is based.
18. Arthur Combs had what to say about effective problem solving?
19. Components of a movement are typically broken down into 3 categories.
20. Give 2 reasons why the book's authors chose to discuss motor performance concepts prior to motor learning concepts.
21. The last 2 paragraphs on page 21 state what?

22. How does the information contained on page 27 in the red “box” relate to the “street”??
23. Stage one of information processing is what?
24. Stage two of information processing is what?
25. Stage 3 of information processing is what?
26. Reaction time is defined as what?
27. Apply the information on page 34-35 to line officer and relate it to Hick’s law.
28. Discuss figure 2.5 and relate it to “the street” be sure to note which present the biggest challenge for LEO’s/CO’s and which you can influence.
29. Describe the “inverted-U” principle.
30. Trait anxiety is what?
31. How might the above to relate to hiring practices
32. How might training affect the “zone of optimal functioning”?
33. Describe perceptual narrowing.

34. Cue utilization hypothesis is what?
35. Relate the muscles-to-mind to performance on-the-job and training.
36. Mind-to-muscle skills are used for what?
37. Describe how you (probably) already utilize this in training or on the job.
38. Parallel processing is what?
39. Controlled processing is what?
40. Automated processing is what?
41. The Stroop effect is what?
42. How can the above be used in firearms training? DT training?
43. List and define the 3 memory systems outline in the text.

----- Chapter 3 -----

-----

44. What game is being played on page 62
45. Define and list 2 examples of exteroception.
46. Define and list 3 examples of interoception.

47. Define proprioception.

48. Define kinesthesia.

49. Describe the vestibular system.

50. Describe muscle spindles

51. Describe Golgi tendon organs.

52. List 2 types of information that cutaneous receptors can deliver.

53. In the article “why can’t this man feel whether or not he’s standing up” how could he use the above sense to “cheat” on experimental tests?

54. Ostensibly why is it you can’t tickle yourself?

55. Describe the nature of a reflex as noted in the text.

56. Describe an M 1 response.

57. describe an M 2 response

58. describe an M 3 response

59. What type response is the classical “knee jerk” response?

60. Is an M 2 response subject to Hick’s Law?

61. How might you train to take advantage of the M 2 response?
62. Describe a triggered reaction.
63. Describe the type of training you employ to develop this in a level one class.
64. Describe the Bliss-Boder hypothesis.
65. Describe the role of focal vision in movement control.
66. Describe the role of ambient vision in movement control.
67. The “quiet eye ”refers to what phenomenon?
68. Summarize the findings in the Bridgman et. al. experiments.
69. Optical Flow provides what 5 types of information?
70. Visual proprioception is described as what?
71. How is the above tied to the “flinch response” that is incorporated into the Dive Defense movement taught by the CJTC?
72. Do successful batters really keep their eye on the ball?
73. Visual dominance is described as what in the text?

----- Chapter 4 -----

-----

74. Identify whether flow training and tactile sensitivity use an open or closed loop control mechanism.

75. List 5 examples of both open and closed loop activities in the C/DT area.

76. Describe a typical activity in Police training that the phenomenon on the bottom of page 122 would be seen.

77. Develop and describe a connection between “surface features” noted on 127 and the concept of contiguous conditioning.

----- Chapter 5 -----

-----

78. Describe the “general motor program” theory.

79. The “fingerprint” of a movement or action refers to what feature of movement?

80. Define a generalized motor program. Be sure to utilize the “phonograph record” analogy to illustrate your explanation.

81. M1 and M2 responses can have what effect on movement variability?

82. How might the above be important from an evidentiary perspective with regard to an excessive force complaint?

83. Should performers emphasize speed or accuracy when attempting a targeted movement?

84. Is your answer consistent with the commonly used phrase of “smooth is fast” or “slow for accuracy”?

85. Explain why or why not?

86. Do experienced batters use their vision to control their movements?

87. What is the value of swinging a weighted bat prior to the actual movement?

----- Chapter 6 -----

-----

88. Individual differences are defined as \_\_\_\_\_, \_\_\_\_\_ differences among people that contribute to differences in task performance.

89. Research on individual differences is concerned with what 2 things?

90. Define abilities as utilized by researchers in the field of human performance.

91. Researchers have identified \_\_\_\_ to \_\_\_\_ cognitive and motor abilities.

92. Comment on the concept of general motor ability

93. Frank Henry was a proponent of the above theory: T or F?

94. Ed Fleishman et. al. research what subject in what population?

95. List the 2 major categories that Fleishman utilized.

96. How did Henry's and Fleishman's hypotheses differ?
97. Discuss one major factor that motor skill instructors need to consider in an attempt to predict future performance of beginners.
98. Develop a flowchart similar to the one on page 181 but use a DT skill for the basis of your chart.

----- Chapter 7 -----  
-----

99. Describe the acronym CARS and what it denotes.
100. Define Generalization in the context of motor learning.
101. Develop an analogous fable similar to the "woodchopper's ball" that is based on LEO/CO which illustrates the idea of generalization. You may use drill concepts as part of your explanation.
102. List and define the 3 categories elements involved with motor performance.
103. The principle of specificity of learning is what?
104. List the 3 stages of motor learning and compare to those used in the Criminal Justice Training Commission Level One manual.
105. What are other names for these stages?
106. Crossman 1959 investigations illustrated what in cigar workers?

107. How does this compare to the “old 3-5 K repetitions” statement?
108. In the “measuring aiming movements” discussion how does this relate to firearms “qualifications?”
109. Is CE or VE already taken into account on a typical target scoring method?
110. On page 217 discussion problem #1, reformat this into a DT or firearms skill related question – and then answer it!

----- Chapter 8 -----  
-----

111. Explain the second paragraph on 221 in the context of an in-service motor skill class.
112. How can giving BOTH verbal and visual information simultaneously be counter productive?
113. List the 2 dimensions identified by Nideffer that people have the capability to control.
114. Describe External informational focus.
115. Describe internal informational focus.
116. Describe broad informational focus.
117. Describe narrow informational focus.

118. Which of the above informational focus has been shown to be superior for beginning learners?
119. Describe the difference between anxiety and arousal.
120. Describe how “process goals” could be used in IRS type drills.
121. Structuring practice (massed vs. distributed) can have an effect during a single session or between several sessions. True or False
122. The results of the 1978 Baddeley and Longman postal worker study demonstrated what?
123. Discuss the concept of limited attentional capacity.
124. Describe “modeling” as it applies to motor learning.
125. Describe guidance.
126. List 3 ways that guidance may have an effect on motor learning.
127. The classic 1959 experiment by Annett involved what?
128. The results inferred what about practice structure?
129. The information in the red box on page 233 relates to what section in the 2071 manual?

130. Simulators such as FATS are only worthwhile when\_\_\_\_\_.
131. Describe part practice as it applies to teaching motor skills.
132. Define the 3 types of part practice outlined in chapter 8 and give an example of each as it applies to motor skill training in the use of physical force.
133. What 3 questions should the instructor ask him/herself when incorporating part practice?
134. Part practice works best when the tasks are what category; and when part practice will not influence what?
135. The mastery of the sub-skills or parts of a \_\_\_\_\_ skill does not guarantee effective performance of the WHOLE skill unless what?
136. What category or motor skill is the least to benefit from part-practice?
137. Argue FOR the use of slow-motion training of motor skills
138. Argue AGAINST the use of slow-motion practice.
139. Define error detection capability.
140. For learners to improve their error detection capability they must become what...?
141. Should the teacher instruct the student to attend to movement produced feedback *during* the movement?

142. Why or why not?
143. Make a DT analogy for each of the 3 highlight boxes on page 243,244, and 245.
144. Define and contrast mental practice with mental imagery.
145. Where and what is the effect of mental practice on the rate of learning motor skills?
146. Describe the procedure for mental imagery outlined in the book.
147. According to recent research mental imagery is most likely to benefit from mental imagery?
148. Rephrased questions 1-8 into a DT/firearms/driving paradigm.

149. Define contextual interference effect.
150. Give specific examples of how this “effect” is manifest in DT training, at the academy and in-service.
151. Explain the elaboration hypothesis with respect the above “effect”.
152. The Shea and Morgan experiments dealt with what phenomenon?
153. The Action-plan–reconstruction hypothesis (ala Lee & Magill) is also called what?
154. What type of practice structure is likely to give the performer a false sense of accomplishment with a motor skill?
155. What is the value of having a wide variety of golf clubs?
156. What are some of the considerations when deciding how soon to introduce random practice?
157. What stage of motor learning is the above point likely to be?
158. When arranging random skills is it better to place similar or dissimilar skills together/juxtaposed?
159. A particular strength of varied practice is that it allows learners to develop what?

160. Discuss the components of varied or constant practice versus random or blocked practice.
161. What has Lee, Magill, & Weeks' research said about combining these variables in practice?
162. How does the above information compare to Christina, et.al. research?
163. Consistent and varied mapping are synonymous to what other terms?

-----Chapter 10 TEN-----

- 
164. Define interoception.
  165. Define exteroception.
  166. Define extrinsic feedback.
  167. Define intrinsic feedback.
  168. Kinematic feedback is synonymous with what?
  169. List the three types of reinforcement outlined on page 284.
  170. Elaborate and differentiate the information contained in the blue box on 287.
  171. Motivation is assumed to be part of what theory?
  172. For retention feedback should be given when the student asks for it?

173. Define program feedback.
174. Define parameter feedback.
175. Define descriptive feedback.
176. Define prescriptive feedback.
177. Define summary feedback.
178. Define attentional cueing.
179. Define bandwidth feedback.
180. Define faded feedback.
181. Describe delayed bandwidth feedback and how it may be connected to recognition memory.
182. List the feedback methods that have a temporal component as one of its defining qualities.
183. List the feedback methods that have a external component as one of its defining qualities.
184. List the feedback methods that have a internal component as one of its defining qualities.

185. Develop a matrix depicting the various types of feedback methods and their commonalities and differences.
186. Comment intelligently on the feedback frequency needed for complex motor skills; give a DT example identifying a skill with similar complexity to the one seen in Figure 8.3.
187. Comment on “a strange golf practice” page 306, and then develop the same regimen for DT, i.e. while on a training run you stop and shadow box.

----- Chapter 11 -----  
-----

188. Read the case studies and develop a similar situation/story for a police motor skill situation i.e. firearms, driving, C/DT. Be sure to incorporate the checklists provided in the book.