June 2015

PSYC 300 – General Principles

Module B Objectives – How does my brain work?

Lesson 1 – The biology of the brain.

This information can be found in Chapter 2 – Neuroscience and Behavior.

1. Identify the functions of different types of neurons, including motor, sensory, interneurons, and the excitatory and inhibitory messages that they carry.

2. Describe different types of glial cells and the importance of myelination.

3. Describe the process of neural transmission from the pre-synaptic neuron to the post- synaptic neuron and the roles and functions of the:

   - Cell body
   - Stimulus threshold
   - Synaptic Vesicles
   - Receptor sites
   - Dendrites
   - Polarization
   - Synapse / Synaptic Gap
   - Axon Terminals
   - Axon
   - Action potential
   - Neurotransmitters
   - Reuptake

4. Identify the functions of Acetylcholine, GABA, Norepinephrine, Serotonin, Dopamine, and Endorphins in neural transmission.

5. Describe how breakdowns in neural transmission contribute to the symptoms of schizophrenia, Alzheimer's disease, depression, anxiety, and Parkinson's disease.

6. Explain how agonists and antagonist drugs affect neural transmission with the diseases/ disorders listed above.

7. Identify the physical effects of traumatic brain injuries.

8. Differentiate the nervous system: the central and peripheral nervous systems, somatic and autonomic nervous systems, and sympathetic and parasympathetic nervous systems.

9. Identify the structures and functions of the endocrine system, including its hormones.

10. Summarize the research on juggling as it relates to functional and structural plasticity.

11. Evaluate the research on neurogenesis.

12. Identify the structures and functions of the brainstem, forebrain, cerebral cortex, and limbic system.

13. Evaluate the research on gender differences in the structure and function of the brain.

14. Identify the structures and regions of the brain responsible for language.

15. Explain how the brain is an integrated system, focusing on lateralization of function and split brain studies.

16. Compare the effects of impoverished and enriched environments on the structural plasticity of the brain.

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Lesson 2 – The functions of the brain.

This information can be found in Chapter 3 – Sensation and Perception.

17. Differentiate between sensation and perception.
18. *Identify the functions and structures that produce vision.
19. Contrast the functions of rods and cones.
20. Explain how we see color, including the trichromatic and opponent-process theories.
21. Identify the functions of the structures that produce hearing.
22. Differentiate loudness, pitch, and timbre.
23. Explain how the "chemical senses" produce smell and taste.
24. Draw conclusions about the validity of human pheromones.
25. Explain how the "body senses" produce touch and pain, including fast and slow pain systems, the gate-control theory, and sensitization.
26. Explain how the kinesthetic and vestibular senses produce movement, position, and balance.
27. Differentiate bottom-up and top-down processing, as it relates to individualistic and collectivistic cultures.
28. Explain the Gestalt principles as they relate to the process of perception.
29. Explain the roles of convergence, binocular disparity, relative size, overlap, aerial perspective, texture gradient, linear perspective, and motion parallax in depth perception.
30. Explain the moon, Müller-Lyer, Shepard Tables, Poggendorf, Ponzo, and horizontal-vertical line illusions.
31. Discuss the significance of perceptual constancies and perceptual sets.
32. Assess the Müller-Lyer illusion cross-culturally using the carpentered-world hypothesis.

Lesson 3 – The ups and downs of memory.

This information can be found in Chapter 6 –Memory.

33. Explain the Stage Model of Memory, including the capacity, duration, and function of information, and the strategies used to retain information at each stage.

34. Explain Braddeley's model of working memory.

35. Identify two factors that enhance encoding into LTM.

36. Differentiate procedural memory, episodic memory, semantic memory, explicit memory, and implicit memory.

37. Explain how information is organized in long term memory.

38. Discuss the significance of retrieval cues as it relates to memory failure.

39. Differentiate recall, cued recall, and recognition.

40. Explain the serial position effect and encoding specificity principle and their effects on memory retrieval.

41. Summarize the research on flashbulb memories.

42. Explain two significant conclusions that can be drawn from Ebbinghaus' research on forgetting.

43. Explain encoding failure, decay theory, interference theory, and motivated forgetting.

44. Explain how source confusion, the misinformation effect, schema distortion, imagination inflation, and false familiarity can produce false memories.

45. Summarize the conclusions about memory based on Lashley's and Thompson's research.

46. Differentiate various forms of amnesia.

47. Identify different brain structures and their roles in the storage and retrieval of memory.

48. Describe 2 abnormal structures in the brains of patients with Alzheimer 's disease.

49. Discuss memory loss as it progresses with Alzheimer's disease.

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Lesson 4 – The intelligence factor.

This information can be found in Chapter 7 –Thinking, Language, and Intelligence.

50. Differentiate mental images and concepts.

51. Summarize the research on brain activation during mental imagery (Focus on Neuroscience, p. 274).

52. Explain how trial and error, algorithms, heuristics, insight, and intuition are used in problem solving.

53. Explain how functional fixedness and mental set interfere with problem solving.

54. Explain how decisions are made using the singe-feature, additive, and elimination by aspects models, and influenced by the availability and representativeness heuristics.

55. Discuss four obstacles to logical thinking (Critical Thinking p. 284).

56. Explain 4 characteristics of language that facilitate communication.

57. Identify the benefits of bilingualism.

58. Contrast the cognitive abilities of different animal species.

59. Discuss the development of the intelligent tests as created by Alfred Binet, Lewis Terman, and David Wechsler.

60. Identify three traits that are better predictors of future success than simply intelligence, according to the results of Terman's longitudinal research.

61. Explain 3 basic requirements of good test design.

62. Contrast Charles Spearman, Louis L. Thurstone, Howard Gardner, and Robert Sternberg's theories of intelligence.

63. Discuss the symptoms and common assumptions of autism spectrum disorder.

64. Summarize the findings on the origins of intelligence using twin studies, including heritability.

65. Explain the differences within groups versus differences between groups as it relates to intelligence tests.

66. Explain stereotype threat and stereotype lift and why they occur.

67. Discuss strategies to reduce stereotype threat.