

BIOL 4260

Exam III Study Guide

The exam will include a combination of multiple choice, very short and short answer questions, and questions that ask you to articulate the answer in a **drawing**. This first exam will cover everything after Exam II.

Fine Print: This is a study **guide**, not a necessarily the outline of the exam or, in any way, a complete catalog of what may be on it.

1 Brain and Limbic System

1.1 Anatomical components of the limbic system

1.2 How you come to know fear

1.3 What's love got to do with development

2 Cranial nerves

2.1 Basic arrangement, position relative to brain

2.2 12 nerve function, origin, destination (i.e., name, SMB, from, to)

2.2.1 Vagus!! Autonomic function

3 Sensory anatomy

3.1 General vs special senses

3.1.1 General senses

1. Exteroreceptors, proprioceptors, Interoreceptors, nociceptors, thermoreceptors, mechanoreceptors, chemoreceptors
2. Nociceptors: fast vs. slow pain, referred pain
3. Mechanoreceptors: Tactile, Baro and proprioceptors
 - (a) Uncapsulated tactile receptors
 - (b) Tactile corpuscle
 - (c) Ruffini corpuscle

3.2 Special Senses

3.2.1 Olfaction

1. Olfactory epithelium and its components
2. Olfactory discrimination

3.2.2 Gustation

1. Gustation pathways
2. Gustation discrimination

3.2.3 Hearing and equilibrium

1. Ear structure and anatomy: regions, position relative to cranium
2. Evolution of major components
3. Anatomy of EIs
4. Inner ear: Vestibular and cochlear components
5. Semicircular function and anatomy
6. Cochlear function and anatomy
7. Vestibular and cochlear pathways to brain

3.2.4 Vision

1. Eye anatomy: external and internal (chambers, compartments, accessory structures)
2. Eye anatomy: the tunics/layers and their functions
3. Eye anatomy: the lens and ciliary bodies
4. Visual accommodation/focus
5. Visual pathway

3.2.5 Proprioception and stretch reflexes

3.3 Motor tracts

3.3.1 SNS vs ANS

3.4 Somatic motor control

3.4.1 Integration of areas of brain involved in planning and movement

3.5 The brain

3.5.1 Developmental divisions

3.5.2 Regions and landmarks

1. Functions

4 Comparative Cranial anatomy

4.1 Jaw development

4.2 Jaw anatomy

4.3 Muscles of mastication

4.3.1 Muscle function and action (origin, insertion, function)

4.4 Comparative jaw anatomy

4.4.1 Condyle, ramus, symphysis, chin, dental archade: Apes → Australopiths → humans

1. relevance in ecology, feeding, locomotion

4.5 Cranial evolution

4.5.1 Ridges and crests: Apes → Australopiths → humans

1. relevance in ecology, feeding, locomotion

4.5.2 Cranial capacity: Apes → Australopiths → humans

1. tempo of brain-size evolution

5 Dental anatomy and development

5.1 Tooth anatomy

5.2 Tooth embryology

5.2.1 Dual nature of skin and tooth development

5.2.2 Tooth lifecycle

1. lamina → bud → cap → bell → tissue genesis → crown formation → root formation → eruptions → function

5.2.3 Tissue formation: amelo- and odontoblasts, coordination

6 Human development

6.1 What makes us odd among mammals, primates

6.2 Human growth and development patterns: brain, soma, reproduction

6.3 Human allometry: patterns and nurture

6.4 Life history

6.4.1 Human energy budgets and investments

6.4.2 Life history values that correlate with energy investments

6.4.3 Comparative LHVs: great apes vs. humans

1. Hypotheses behind each strategy/investment pattern, what limits/has selected for them