

NEUROSCIENCES (Dr. Ravi Shankar Akundi)

(2 credits)

1. Introduction to Neurosciences – history of neuroscience, methods to study brain, language processing in the brain
2. Neurocytology – the neuron doctrine, neuronal architecture – dendrites, soma and axon, non-neuronal cells in the brain
3. The Neuron – membrane potential and propagated signalling, electrical and chemical synapses, synaptic transmission, neuromuscular junction
4. Neurochemistry – neurotransmitters and their life cycle, glutamate and NMDA signalling, biogenic amines
5. Neuroanatomy – anatomical terminology, major brain regions and its organization, spinal cord organization
6. Somatosensory Systems – perception, biological basis for pain, pain regulation
7. Learning and Memory – types of memory, storage of memory, brain plasticity, memory loss in Alzheimer's disease
8. Comparative Neuroscience – invertebrate brain, brain adaptations, cortical evolution and cortical reorganization, influence of environment on brain development
9. Neural Development – neural tube organization and patterning, major brain area differentiation, Spemann organizer and signalling mechanisms

Textbooks

1. *Principles of Neural Science – Eric Kandel, Schwartz and Jessell – McGraw Hill (2000)*
2. *Neuroscience – Dale Purves – Sinauer (2011: 5th ed.)*
3. *Fundamental Neuroscience – Larry Squire (2008: 3rd ed.)*
4. *Neuroscience, Exploring the brain – Bear, Connors and Paradiso*

Websites

1. *Society for Neuroscience (www.sfn.org)*
2. *Journal of Neuroscience (www.jneurosci.org)*
3. *National Institute of Neurological Disorders and Stroke (www.ninds.nih.gov)*
4. *The Whole Brain Atlas (www.med.harvard.edu/AANLIB/home.html)*