Review

- Intro K2
  - functions of glial cells
  - parts of neurons
  - types of neurons
  - electrical transmission of information
    - stretch reflex
- Genes and Behavior K3
  - what are genes?
  - Heredity, kinds of mutations
  - Per and Tim genes
  - genes and disease
- Cytology K4
  - how are neurons like epithelial cells
  - cytoskeleton
  - myelin
  - spines
- Synthesis and Trafficking K5
  - translation and transcription
  - protein sorting and packaging
  - transport and motors

- Ion Channels K6
  - selectivity
  - conformational changes
  - techniques to study
  - how gated?
  - Diversity
- Membrane potential K7
  - ionic basis
    - ionic concentrations
  - how created
  - Nernst and Goldman Equations
  - techniques to study
  - circuit descriptions
- Passive Signaling K8
  - capacitance
  - ohm's law
  - length and time constants
  - flow of current
  - myelin

- Action potential K9
  - current flow
  - channel kinetics
  - activation and inactivation
    - ball and chain
  - variations on a theme
    - diversity of firing properties
      - delayed firing
      - bursting
      - accommodation
  - mechanisms of voltage gating
  - modulation of firing rate
- Synaptic Transmission Overview K10
  - Electrical vs. chemical
- Neuromuscular Junction K11
  - NMJ vs. Central Synapses
  - End Plate Potential – nACh
    - Both Na+ and K+

- Synaptic Integration K12
  - Excitatory vs. Inhibitory
  - Spatial and temporal summation
    - Patterns of inputs
- Second messengers
  - Metabotropic vs. Ionotropic
    - Second messengers amplify but are slower
  - Second messengers interact with one another
  - Second messengers can have both short- and long-term effects
- Transmitter Release K 14
  - Ca++ trigger
  - Quantal release
  - Synaptic vesicles – steps and proteins
  - Many factors regulate amount of release
- Neurotransmitters K 15
  - Criteria to be considered a transmitter
  - Peptides vs. small molecule transmitters
    - synthesis
  - Corelease
  - Removal from cleft

- Myasthenia Gravis K 16
  - Diagnosis
  - Treatment
  - Cause
- Early Development P22
  - Genetic control
  - Generation of neural diversity
- Construction of Neural Circuits P23
  - Growth cone
  - Axon guidance mechanisms
  - Topographic maps
  - Neurotrophic factors
- Developmental Plasticity P24
  - Critical periods
  - Ocular dominance plasticity
- Adult Plasticity and Learning P25
  - Synaptic plasticity
    - Habituation, Sensitization, Association
    - LTP and LTD in mammalian brain
    - Plasticity in adult cerebral cortex