

Review topics for Exam 3

Lecture 27 - Illusions, Masking, Motion

- Masking, after-effects and visual adaptation
- Contrast gradient and interpretation of direction of motion
- Minimum speed for motion perception
- Motion coherence
- First-order versus second-order motion
- Dynamic visual acuity
- Saccadic suppression

Lecture 28 - Color vision intro

- Trichromacy
- Definition of a metamer
- Table 2 – minimum hues needed to achieve a metameric match
- Grassman's laws

Lecture 29 - Normal color vision

- Hue, saturation, brightness
- Don't need to memorize colorimetric purity equation, but understand it
- Normal relative saturation function
- Normal wavelength wavelength discrimination function
- Bezold-Brücke phenomenon – understand graph
- Definition of Abney's phenomenon – general idea, not details
- Color constancy

Lab 8 - CIE chromaticity diagram

- Tristimulus values, chromaticity coordinates
- Color mixing, excitation purity, dominant wavelength
- Complementary color

Lecture 30 - Color opponent theory

- Color opponent systems
- Zone models
- Differences between hereditary and acquired color anomalies
- Definitions of protanopia, deuteranopia, tritanopia, tetartanopia and corresponding anomalies

Lecture 31 - Anomalous color vision

- Percentage of males affected by hereditary color anomalies
- Which is most common?
- $V(\lambda)$ for protanopes and deuteranopes
- Wavelength discrimination for protans, deutans and tritans
- Color confusion lines, copunctal points
- Neutral points – don't worry about the numbers, but understand the principle
- Saturation for protans, deutans and tritans

Lecture 32 - Acquired color anomalies

- Know probability of different genetic outcomes for color blindness
- Köllner's rule
- Cyanopsia and cataracts
- Red cap tests

Lecture 33 - Testing color vision

Lab 10 - Testing color vision

- Theory behind design of PIP tests

- How to do and interpret the HRR and D-15 tests
- How to interpret the Hundred-Hue test

Lecture 34 - Anomaloscope – know all cases

Lecture 35 – Gross electrical potentials

- EOG, including Arden ratio
- Standard ERG, when it's used, ISCEV five-step protocol, typical read-out
- Multifocal ERG - what it is
- VER, when it's used, expected data plot, implicit time

Lab 11 – ERG

Lab 12 - VER

Lecture 36 - Retinal electrophysiology

- Ganglion cell characteristics
- Ganglion cell types – X, Y, on/off center
- Photoreceptor physiology – phototransduction and hyperpolarization

Lecture 37 - Parvo and magno parallel pathways

- Other names used for parvo and magno type pathways
- Anatomic differences between parvo and magno pathways
- Functional differences between parvo and magno pathways
- How does the konio pathway fit in?

Lecture 38 - Frequency doubling, Intro to psychophysics

- How do parvo/magno differences fit into glaucoma diagnosis?
- How does FDT isolate magno ganglion cells?
- What causes the frequency doubling illusion?
- FDT basically a contrast sensitivity test
- Psychometric function
- Ogive curve a cumulative normal
- Why do thresholds seem to vary?
- Fechner's contribution to psychophysics

Lecture 39 - Psychophysical methodology

- How to set up an experiment using a method of constant stimuli
- How to interpret results of a constant stimuli experiment
- Advantages and disadvantages of method of limits
- Staircase approach
- Method of adjustment
- Advantages/purpose of forced choice
- Estimating thresholds in a forced choice constant stimulus experiment
- Estimating thresholds in a forced choice staircase experiment

Lecture 40 - Theory of signal detection

- Purpose of the theory of signal detection (TSD)
- What causes variable noise distribution?
- Detectability
- What causes variability in the neural activation when the stimulus is present?
- Four different possible responses in a detection experiment
- Affect of lax and strict criteria
- How to influence the subject's criteria with penalties or rewards
- Estimating probability of getting each of the four possible responses
- Sensitivity and specificity

Lecture 41 – ROC curves and other topics