

# Sensation and Perception

**Professor Dave F. Kleinschmidt**

**Spring Semester, 2020**

**Rutgers University Psychology Department**

## **Course Information:**

Rutgers Course Number: 01:830:301:01

Date and Time: Mondays and Wednesdays 1:40-3:00

Location: SEC-111

Prerequisite: 830:101 Introduction to Psychology

## **Instructor:**

Dr. Dave F. Kleinschmidt

Email: [dave.kleinschmidt@rutgers.edu](mailto:dave.kleinschmidt@rutgers.edu)

Office: Psych 213 (Busch Campus)

Office Hours: Wednesdays from 3:15-4:15 (after class)

## **Teaching Assistant:**

Janace Gifford

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Office: Psych 319 (Busch Campus)

Office Hours: By appointment

## **Goals for this Course:**

There are several goals for students in this course. First, you should expect to learn the fundamental principles and many details about how the nervous system gives rise to your perception of the world around you. Second, you should gain experience in the critical reading of primary scientific literature. Third, you should gain an improved understanding of how modern neuroscientific research advances. Finally, you will hopefully walk away with an informed appreciation of the complexity and beauty of the interaction between mind and brain.

**Textbook:** *Sensation & Perception*, by Jeremy Wolfe, et al. (2018) Fifth Edition, Sinauer Associates.

We will be using the textbook *Sensation and Perception* by Wolfe et al. from Sinauer Associates (ISBN 9781605356419 for the 5th Edition hardcover). There are many audiovisual examples on the [textbook publisher's website](#) and cited in the book – you should get in the habit of looking at them.

**Papers:** In the course of the semester, your textbook reading will be supplemented with papers from the primary scientific literature, as listed below. These readings are mandatory, and you should ensure that you understand and are capable of succinctly summarizing the background, methods, results, and discussion of each of them, as this is a common exam question. The papers can be downloaded from the class Canvas site under Files.

**Reading:** This class will cover a lot of material quickly, and you are responsible for the information in the book chapters and papers as well as the content of the lectures except when explicitly told otherwise in class. You are *strongly advised* to keep up with the reading and to read for both detail and understanding.

**Attendance:** You should plan to attend every lecture because there will be some material covered in lecture that is not included in your reading. In past classes there was a strong correlation between class attendance and final grade. If you expect to miss one or two classes, please use the University's absence reporting website at <https://sims.rutgers.edu/ssra>.

**Conduct:** Students are expected to pay attention in class. Use of computers and other electronic devices for anything other than note-taking is distracting to fellow students and is not permitted. Should I perceive a student's behavior to be disruptive to fellow students in the class, I will ask the student to leave the classroom, and, if this occurs on a regular basis, I may judge the disruptive student to be unable to successfully complete the course with a passing grade.

**Canvas:** The course has a dedicated Canvas site at [canvas.rutgers.edu](https://canvas.rutgers.edu). All registered students should automatically be members of the site. The site includes downloadable readings for the course, this syllabus, a chat room, and a venue for announcements to the class. This is the tool I will use to email the entire class when necessary. You may also find me in the chat room occasionally.

**Email:** I do my best to respond to all student emails. It's highly unlikely that I will respond to emails that I receive after 6pm until the next day. If you have a question about material from the class, it's better to use the Canvas discussion board: someone may have already asked for clarification on the same material, and my response can be of help to everyone in the class.

**Evaluation:** There will be two mid-term examinations in this course, plus a comprehensive final exam. Because of the large enrollment, these exams will be primarily multiple-choice, but short answer and essay questions are possible. Exam questions will be drawn from any assigned chapter in the textbook, the assigned papers, and any subject covered in lecture. The midterm exams will each count for 25% of your final grade, while the final will count for 50%. You must bring an appropriate writing implement to answer Scantron-based multiple choice questions. I will not consider requests for extra credit for extra work during or after the semester. Do not ask. I will not consider requests for re-grading of exam questions except in the case of a computation error by the grader. Do not ask.

**Make-up Exams:** All students are expected to take the exams on the day they are offered. If you are so ill that you cannot physically take the exam on the scheduled day, you must notify me by email *before* the exam starts. A make-up exam will be offered during the reading period at the end of the semester. This exam will be different than the corresponding midterm exam and will be entirely composed of written questions, such as definitions, short answer, and essay questions.

**Final Exam:** The final exam will test all of the material covered during the semester and will be

offered at the time and date listed at <http://finalexams.rutgers.edu>. As of today, the final exam scheduled for **Tuesday May 12, 12-3pm** (I will advise if the date, time, or location is changed by the Registrar's office). Students may not take the exam early. Students with excused absences from the final exam will be permitted to take a written makeup exam at a date and time to be scheduled in May.

**Cheating** All students are required to comply with the University's Academic Integrity Policy, as presented at <http://academicintegrity.rutgers.edu>. Cheating on exams or assisting others in cheating on the exams will be punished.

**Special Circumstances for Students with Disabilities** If you receive special accommodations for exams, you must provide your official Letters of Accommodation to Professor Kleinschmidt at least one week prior to the first exam. You must ALSO make appropriate arrangements with the Office of Disability Services for them to proctor your exam at the same day and time as the rest of the class. The ODS requires you to make these arrangements at least five business days ahead of each individual exam. If you fail to make arrangements through ODS, you will not receive special accommodations and will be required to take the exam with the rest of the class.

## Course Schedule for Sensation & Perception

**NOTE: The dates of the exams are definite, but the exact schedule of which material is covered on which day may vary slightly.**

### **1: Wed January 22:**

Reading: this syllabus

Topics: Overview, physical traits determine perception, history of perception research

### **2: Mon January 27:**

Reading: Chapter 1: Introduction

Topics: Psychophysics

### **3: Wed January 29:**

Reading: Chapter 1: Introduction (cont.)

Topics: Signal detection theory, fourier analysis

### **4: Mon February 3:**

Reading: Chapter 2: The First Steps in Vision

Topics: Elementary neuroscience and physiological methods in perceptual research

**5: Wed February 5:**

Reading: Chapter 2: The First Steps in Vision (cont.)

Topics: Structure of the eye, retina

**6: Mon February 10:**

(Guest lecture by Prof. John McGann)

Reading: Chapter 5: The Perception of Color

Topics: Trichromatic vision, color representation in the brain

**7: Wed February 12:**

(Guest lecture by Prof. John McGann)

Reading: McGann (2017). Poor human olfaction is a 19<sup>th</sup> century myth. *Science* 356:597 pii: eaam7263., and Chapter 14: Olfaction

Topics: Olfactory system structure and physiology, olfactory psychophysics

**Mon February 17: NO CLASS**

**8: Wed February 19:**

(Guest lecture by Prof. John McGann)

Reading: Chapter 14: Olfaction

Topics: Behavioral neuroscience of olfaction

**9: Mon February 24:**

Reading: Chapter 2: The First Steps in Vision (cont.)

Topics: Retinal information processing, adaptation

**10: Wed February 26: FIRST MIDTERM EXAM (Classes 1-9)**

**11: Mon March 2:**

Reading: Chapter 3: Spatial Vision

Topics: Visual acuity, subcortical and cortical visual processing

**12: Wed March 4:**

Reading: Chapter 3: Spatial Vision (cont.)

Topics: Selective adaptation, visual development, middle vision

**13: Mon March 9:**

Reading: Chapter 4: Perceiving and Recognizing Objects

Topics: Middle vision (cont.) and object recognition

**14: Wed March 11:**

Reading: Quiroga et al. (2005) Invariant visual representation by single neurons in the human brain. *Nature* 435:1102-1107.

Topics: Quiroga et al. paper

**Mon March 16 and Wed March 18: NO CLASS SPRING BREAK**

**15: Mon March 23:**

Reading: Chapter 6: Space Perception & Binocular Vision

Topics: Stereopsis, depth cues, etc.

**16: Wed March 25:**

Reading: Chapter 8: Visual Motion Perception

Topics: Neural computation of motion, using motion information

**17: Mon March 30:**

Reading: Chapter 9: Hearing: Physiology & Psychoacoustics

Topics: Auditory system structure, hearing characteristics

**18: Wed April 1:**

Reading: Chapter 10: Hearing in the Environment

Topics: Sound localization, complex sound recognition

**19: Mon April 6:**

Reading: Chapter 11: Music and Speech Perception

Topics: auditory scene analysis

**20: Wed April 8: SECOND MIDTERM EXAM (Classes 11-19)**

**21: Mon April 13:**

Reading: Chapter 13: Touch

Topics: Structure and function of the somatosensory system, haptic perception

**22: Wed April 15:**

Reading: Chapter 13: Touch

Topics: Touch (cont.)

**23: Mon April 20:**

Reading: Chapter 7: Attention and Scene Perception

Topics: Attention, visual search

**24: Wed April 22:**

Reading: Attention and Scene Perception (cont.)

Topics: Physiological basis of attention, attentional disorders

**25: Mon April 27:**

Reading: Chapter 12: Spatial Orientation and the Vestibular System

Topics: Angular/linear motion and tilt, structure & function of the vestibular system

**27: Wed April 29:**

Reading: Chapter 15: Taste

Topics: Structure and function of the gustatory system, gustatory psychophysics

**28: Mon May 4:**

Reading: Review your notes for questions

Topics: Question-driven review & discussion of the entire course.

**Tue May 5: MAKE-UP EXAMINATION**

Time and location to be announced.

For students with *excused absences* from midterm exams only.

**Tue May 12 (12pm): COMPREHENSIVE (ALL MATERIAL) FINAL EXAM**

Location to be announced. Date/time may change, refer to [finalexams.rutgers.edu](http://finalexams.rutgers.edu) for official time.