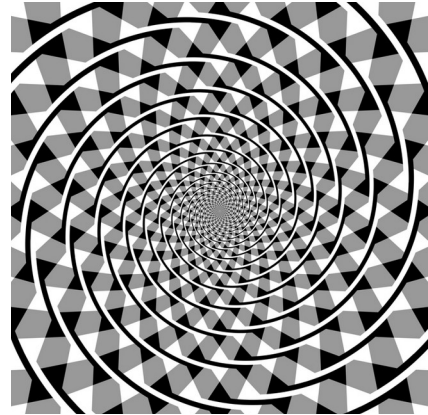


The external world seems immediately available to our senses. Unlike other “higher” cognitive functions like memorizing or problem solving, the act of perceiving does not seem to require any effort. Yet the feat achieved by the perceptual system becomes immediately clear when one tries to build an artificial system that can perceive. Today, we can build a computer to defeat chess grandmasters and jeopardy champions, yet no computer system can outperform a human child on any general vision task. Why is it so?

Through this course, we will gain some appreciation of the enormous task of perception and the underlying processes that realize it. The central question we investigate is the following: how do our senses transform the external world into information that our brains/minds can understand and reliably interpret?

Sensation and Perception is an area of scientific inquiry that spans psychology, biology, physics, and computer science. We will examine the perceptual process at a number of different levels, from single neurons, to neural systems, to behavior and subjective experience. You will have the opportunity to find answers to many questions about yourself and the world around you. Most of all, you will have the opportunity to gain practical knowledge about perception that can enrich your everyday life.



### Basic info.:

**Time:** Tuesday & Thursday 10:20-11:40 am  
**Place:** Biomedical & Physical Science Bldg 1415  
**Textbook:** Sensation and Perception, Yantis & Abrams, Worth Publisher, 2nd Edition (2016)  
**Assignment:** LaunchPad Solo for Sensation and Perception, accessible via D2L

**Instructor:** Taosheng Liu PhD  
**Email:** [tsliu@msu.edu](mailto:tsliu@msu.edu)  
**Office:** <https://msu.zoom.us/j/7786539856>  
**Office hours:** Wed 1-2pm (and by appointment)

**Teaching assistant:** Beau Zhang  
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**Office:** <https://msu.zoom.us/my/beau.zh>  
**Office hours:** Tues 1-2pm (and by [appointment](#))

### Evaluation criteria (out of 100%):

Exams (3 exams, 24% per exam)	72%
Assignments (participation only)	16%
Quizzes (4 quizzes, 3% each)	12%

### Exams:

There will be three in-class exams. Each exam will be composed of multiple choices and short answers. Exams will be in-person during scheduled class times (see schedule table below).

### Assignments:

You will complete 16 interactive activities on LaunchPad. These hand-on activities reinforce the concepts introduced in the class with demonstrations and short experiments. There are multiple choice questions at the end of each assignment. However, we only count your participation, not your performance on these questions. For each assignment, you earn 1% toward the final grade.

**Quizzes:**

There will be 4 online quizzes with multiple choice questions. You will earn points based on your actual performance. Quizzes are available on D2L on the designated dates (see schedule below) for the a 48-hr period (0:00 on Day 1 to 23:99 on Day 2). You have 15 min to complete it once you start.

**Grade scale:**

Final numeric grade is based on a weighted sum of the three components listed above, and the conversion from the raw score to the numeric grade is the following:

Numeric grade:        4.0    3.5    3.0    2.5    2.0    1.5    1.0    0

Raw percentage: 100-----90-----85-----80-----75-----70-----65-----60

\*The upper bound is exclusive and the lower bound is inclusive (e.g., 3.0=80.00%-84.99%)

**Class schedule** (tentative, subject to change)

<b>Date</b>	<b>Topic</b>	<b>Reading</b>	<b>Assignment and due</b>
Jan 10	Introduction	Chap 1	
Jan 12 & 17	Physiology and Psychophysics	Chap 1, Appendix	
Jan 19 & 24	Eye and Retina	Chap 2	Jan 27: A1
Jan 26	Lateral inhibition and lightness perception	Chap 2	
Jan 31	Visual cortex (I)	Chap 3	
<b>Feb 2-3</b>	<b>Quiz 1</b>		Feb 3: A2,A3,A4
Feb 2	Visual cortex (II)	Chap 3	
Feb 7	<i>Catch up &amp; Review</i>		Feb 10: A5, A6, A7
<b>Feb 9</b>	<b>Exam 1</b>		
Feb 14 & 16	Object recognition (I & II)	Chap 4	Feb 17: A8
Feb 21 & 23	Color perception (I & II)	Chap 5	Feb 24: A9, A10
Feb 28	Depth perception (I)		
<b>Mar 2-3</b>	<b>Quiz 2</b>		
Mar 2	Depth perception (II)	Chap 6	Mar 3: A11
Mar 14 & 16	Motion perception (I & II)	Chap 7	Mar 17: A12
Mar 21 & 23	Attention and Awareness (I & II)	Chap 9	Mar 24: A13, A14
<b>Mar 27-28</b>	<b>Quiz 3</b>		
Mar 28	<i>Catch up &amp; Review</i>		
<b>Mar 30</b>	<b>Exam 2</b>		
Apr 4 & Apr 6	Sound and auditory system	Chap 10	
Apr 11 & 13	Sound localization and auditory scene	Chap 11	Apr 14: A15, A16
Apr 18	Speech and music	Chap 12	
Apr 20	Body and chemical senses	Chap 13, 14	
<b>Apr 24-25</b>	<b>Quiz 4</b>		
Apr 25	<i>Catch up &amp; Review</i>		
<b>Apr 27</b>	<b>Exam 3</b>		

\* **Spring break: Mar 6-10**

## List of Assignments

- A1: absolute threshold
- A2: functional anatomy of the retina
- A3: spectral sensitivity of photopigments
- A4: blind spot
- A5: receptive fields of retinal ganglion cells
- A6: responses of simple cells in V1
- A7: orientation tuning of simple cells in V1, and population coding
- A8: principles of perceptual grouping
- A9: additive color mixtures and primary colors
- A10: Opponent color representations
- A11: binocular disparity
- A12: apparent motion
- A13: selective attention
- A14: attentional capture
- A15: auditory grouping by frequency similarity
- A16: auditory grouping by temporal proximity

## Course Policies:

**Make-up Exams:** Make-up exams can be granted under special circumstances. This can include, for example, 1) a documented medical emergency, 2) a schedule conflict that you know about in advance such as a religious holiday or sports travel, or 3) other life challenges such as accidents/emergencies etc. In all cases, please inform me ASAP and *provide documentation*. All claims are subject to verification. In case of a schedule conflict, you must inform me at least a week in advance of exam day. Do not assume I have gotten your email unless I have responded to you.

**Quizzes and Assignments:** Both the quizzes and assignments are available online for extended period of time. The 15 min quizzes are available for a 48 hr period, while the assignments are always available until the due date. You have ample time to complete both activities. Thus, *we will adopt a stringent criterion if you request exceptions/extensions*. You need to demonstrate a compelling cause. Computer and network problems are not considered legitimate causes because you can always find alternatives for use (e.g., library, computer lab, McDonald's).

**Academic Honesty:** The Psychology Department adheres to the policies on academic honesty as specified in General Student Regulations 1.0, *Protection of Scholarship and Grades*; the all-University Policy on *Integrity of Scholarship and Grades*; and Ordinance 17.00, Examinations. (See [Spartan Code of Honor Academic Pledge](#) and/or the MSU Web site: [splife.studentlife.msu.edu](http://splife.studentlife.msu.edu)). Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, lab work, quizzes, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also <https://www.msu.edu/~ombud/academic-integrity/index.html>).

**Accommodations for Students with Disabilities:** Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at [rcpd.msu.edu](http://rcpd.msu.edu). Once your eligibility for an accommodation has been determined, you will be issued a Verified Individual Services Accommodation ("VISA") form. Please present this form to me at the start of the term and/or two weeks prior to the accommodation date (test, project, etc.). *Requests received without sufficient lead time may not be honored due to logistic issues that can arise.*