What is perception? Perception is best described as the process of using sensory signals to infer the properties of objects in the world.

OK, but what's this course about? Perception is at the heart of most human activities, but its importance usually goes unnoticed. After all, perception works fast, accurately and with what seems to be no effort at all. But this process serves us in so many ways, enabling us to detect, recognize, identify, and respond to the important things in our environment. Just imagine what life would be like if you lost those abilities!

But the speed, accuracy and ease that characterizes perception obscure the incredibly complex, awe-inspiring processes that lurk behind perception. That is why I've been fascinated with perception ever since my junior high science teacher first opened my eyes to perception's marvels and complexities.

This course will introduce you to contemporary research on the neural machinery that makes your perceptions possible. You will learn how we acquire, process and use information about objects and events in our environment; and you'll learn how the properties of our sense organs and brain shape the world we live in. And we will not ignore the ways in which cognitive factors put their stamp on perception; they are important, too.

Throughout, the course's main focus will be on the perceptual achievements of normal, healthy, adult humans, but to put those achievements in context, we will also examine perception in non-human animals and in non-biological perceptual systems, that is, machines. Finally, in the interests of depth, our focus will be limited to just two of our senses, vision and audition. I don't guarantee that other senses will never be mentioned, but the focus will be squarely on vision and audition.

How will the course work? Meetings are in lecture format, with emphasis on class participation. From the course's space on Latté you'll be able to download the images around which class meetings are organized. These will be useful for review.

What will be read? We will be reading chapters from the classic textbook by Randolph Blake and Robert Sekuler, Perception, Fifth edition (New York: McGraw-Hill). The assigned chapters will be posted on our Latté site. If you want, you may of course purchase a used hardcopy of the whole textbook. In addition to the textbook, assignments will include material posted on Latte, plus demonstrations and some material from the intertubes.

LATTÉ. Some of the course's activities take place on the course's Latté site. Please be mindful of privacy issues when you access our Latté site (or, for that matter, whenever you use email, respond to strangers' offers of $20M in exchange for your social security number and credit card account information, post potentially-embarrassing, career-ending photos on Facebook, etc). In particular, be aware that Latté records accesses from each user account, and that from time to time, I may review that information in order to assess effort and progress.

What is expected of students? I expect that before coming to class, you will complete assigned readings and think about what you’ve read. Doing the reading before class is the only

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way you can get the most of the course --and it's also the route to your making the best
contributions to class discussion. **Note:** During each class meeting, a random selection precise
will be used to call upon students who will then answer one or more question(s) based on
readings or lecture.

**How will students be evaluated?** To aid your preparation, sample exams will be posted on
Latté. With the exception of the first exam, which will be exclusively multiple choice and short
answer items, exams will include multiple choice, short-answer and short-essay questions. The
third (longest) examination will draw on material from the entire course, while emphasizing the
most recent material.

Ninety five percent of the course grade will be set by aggregated, weighted performance on
exams, as explained below; five percent will be set by contributions to class discussion.
Your numerical score on each exam will be normalized relative to the highest score in the class
on that exam. That normalization transforms each numerical score into values that run from
1.0 down. To determine your total score for the course, each normalized score will be weighted
before being entered into your total. The normalized score on the first and second exams will
each be weighted 0.30 each; and the normalized score on the third (final) exam will be weighted
0.40. (If my arithmetic is correct, the three weights should sum to ~1.0.

After all the normalized weighted scores for a student have been added together, that sum will
be translated into a letter grade as follows: 0.85 to 1.00 will span the range A- to A+; 0.72 to
0.84 will span the range B- to B+; 0.61 to 0.71 will span the range C+ to C-. Aggregated
weighted total scores 0.60 or below will receive D or below.

If, after receiving your graded exam, you wish to contest the grading of a question, your answer
to that question will of course be reviewed. But, additionally, the grading of the entire exam will
be reviewed. The resulting review may produce either an increased grade or a reduced one,
neither of which will be subject to further review.

**Exam dates.** The dates of the exams that are shown on the schedule below. Note in particular
that the Registrar has tentatively scheduled our final (third) exam on May 6.

I do my level best not to change exam dates once the semester has begun, so please make
sure now that your social calendar, plans for travel to exotic places or non-exotic ones, and
auditions for "America’s Got Talent" or "Kourtney and Kim Take Waltham", etc., do not conflict
with those dates. I understand that extenuating circumstances, such as serious illness, can
prevent someone from taking an exam as scheduled. Therefore, makeup exams can be given,
but only with prior approval (at least 24 hours before the scheduled exam) from the instructor,
supported by documentation of the necessity of the makeup, e.g., a letter from a licensed
physician who is not a relative.

**How about extra credit?** Under no circumstances will opportunities for so-called "extra credit"
assignment be given. The availability of ad-hoc, "extra-credit" arrangements tend to produce
what economists call a "moral hazard" (ML Wilson, *Atlantic Economic Journal*, 2002, 30, 97). In
particular, the very possibility of such opportunities tends to encourage some students to
prepare less carefully for exams, on the assumption that they could be rescued by extra credit
assignments.
**Accommodations for disability.** As in all Brandeis University courses, for Perception: Human, Animal and Machines any student with a diagnosed disability should alert the instructor as soon possible to the special needs arising from that disability, and provide documentation of the disability.

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<th>DATES</th>
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<th>READINGS (TBA)</th>
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<tr>
<td>1/13</td>
<td>Introduction</td>
<td>O. Sacks; B&amp;S Chapt 1</td>
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<td>1/15 1/20 1/22 1/27</td>
<td>Eyes, Machines &amp; Cameras: How they work or don't</td>
<td>B&amp;S Chaptrs 2, 3 plus Latte</td>
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<td>1/29 2/3 2/5 2/10</td>
<td>Brains and seeing</td>
<td>B&amp;S Chapt 4, plus Latte</td>
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<td><strong>First examination</strong></td>
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<td>2/24 2/27 3/3</td>
<td>Pattern/object perception/attention</td>
<td>B&amp;S Chapters 5 &amp; 6 plus Latte</td>
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<td>Color vision (human and not)</td>
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<td>3/17 3/19 3/24</td>
<td>Hearing (Mostly human)</td>
<td>B&amp;S Chapters; TBA</td>
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<td><strong>Second examination</strong></td>
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<td>3/31 4/2 4/14</td>
<td>Music, MP3, CODECS and beyond</td>
<td>B&amp;S Chapter; Compression &amp; recovery: Images, video &amp; sound files</td>
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<td>4/23 4/30</td>
<td>Biometrics &amp; bloodhounds: Trustworthy or not?</td>
<td>Applications &amp; &quot;sensory&quot; challenges</td>
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<td><strong>Final examination</strong></td>
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