Course Title
Perception

Course Number
PSYCH-UA.9022001

Instructor Contact Information
Martin Rolfs
martin.rolfs@nyu.edu

Course Details
Tuesdays, 3:30pm to 6:15pm, NYUB, Academic Center, Room "Pankow"

Prerequisites
Prerequisite for NYU Students: PSYCH-UA 1 / Introduction to Psychology

Units earned
4

Course Description
How do we construct a conception of physical reality based on sensory experience? In this course, we will survey basic facts, theories, and methods in the study of sensation and perception. The major emphasis is on vision and audition, however other modalities will also be covered. Representative topics include receptor function and physiology; color; motion; depth; psychophysics of detection, discrimination, and appearance; perceptual constancies; adaptation, pattern recognition, and the interaction of knowledge and perception.

Course Objective
The objective of this course is to help you master the fundamental facts and concepts of perceptual psychology and sensory neuroscience. This is an interdisciplinary field of science, crossing the boundaries between psychology, biology, physics, and engineering.

An effort is made, therefore, to present the main concepts of perception in a way that will introduce you to how scientific research is done and to stimulate your scientific curiosity. Some of the concepts covered in this course will be useful to you in various professions that you might pursue. For example, the perceptual problem of eyewitness accounts of crimes is of interest to the legal community; the physiology of animal sensory systems is of interest to the medical community.

Assessment Components
The final grade will be composed of a weighted average, with the following weights assigned to individual assessment components:

15% Class Participation
15% Response Papers
35% Midterm exam
35% Final exam

Failure to submit or fulfill any required component may result in failure of the class, regardless of grades achieved in other assignments.

**Participation:**
Students are expected to prepare each meeting by reading the specified material, to be present during at all sessions of the course, to engage in and complete exercises and quizzes, and to actively contribute to discussions.

**Response papers:**
Response papers will summarize and discuss a scientific article on the general subject of Perception. I will give you a short list of prompts from which you can choose one ten days prior the submission deadline, at the latest. PDFs will be online on NYU Classes, printouts will be provided upon request. Response papers should be 2 pages long (A4, 2 cm margin on each side, double-spaced, Times New Roman, Font Size 12). They should summarize the method and the findings of the research paper, give at least one interpretation of the result and discuss potential follow-up studies. Papers must be submitted by midnight on the respective due date.

**Exams:**
During the week before the fall break (midterm) and in the last session of the semester (final), you will write exams. These will include both multiple-choice and open-answer questions. You will have 90 min to complete your exam.

**Mini-quizzes:**
We will have ungraded (and anonymous) mini-quizzes at the end of each session that will give you the opportunity to quickly let me know if some topic was unclear and needs some extra coverage. Please use this opportunity. If you must cram before an exam, please don't expect me to cram with you. In the days prior to an exam, I will be available as usual for office hours but not for extra time to help you get caught up if you've fallen far behind. It would not be fair to your fellow students if you were to monopolize office hours and sessions for a long period of time right before an exam.

**Assessment Expectations**

**Grade A:** The student makes excellent use of empirical and theoretical material and offers well-structured arguments in his/her work. The student writes comprehensive essays / answers to exam questions and his/her work shows strong evidence of critical thought and extensive reading.

**Grade B:** The candidate shows a good understanding of the problem and has demonstrated the ability to formulate and execute a coherent research strategy.

**Grade C:** The work is acceptable and shows a basic grasp of the research problem. However, the work fails to organize findings coherently and is in need of improvement.
Grade D: The work passes because some relevant points are made. However, there may be a problem of poor definition, lack of critical awareness, poor research.

Grade F: The work shows that the research problem is not understood; there is little or no critical awareness and the research is clearly negligible.

Grade Conversion
Your instructor may use one of the following scales of numerical equivalents to letter grades:

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<tr>
<th>Grade</th>
<th>Numerical Equivalent</th>
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<tbody>
<tr>
<td>A</td>
<td>94-100</td>
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<tr>
<td>A-</td>
<td>90-93</td>
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<tr>
<td>B</td>
<td>84-86</td>
</tr>
<tr>
<td>B-</td>
<td>80-83</td>
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<tr>
<td>C</td>
<td>74-76</td>
</tr>
<tr>
<td>C-</td>
<td>70-73</td>
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<tr>
<td>D</td>
<td>65-66</td>
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<tr>
<td>D+</td>
<td>67-69</td>
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<tr>
<td>F</td>
<td>below 65</td>
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Alternatively:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Equivalent</th>
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<tbody>
<tr>
<td>A</td>
<td>4.0</td>
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<tr>
<td>A-</td>
<td>3.7</td>
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<tr>
<td>B</td>
<td>3.3</td>
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<tr>
<td>B-</td>
<td>3.0</td>
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<tr>
<td>C</td>
<td>2.3</td>
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<tr>
<td>C-</td>
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<tr>
<td>D</td>
<td>1.3</td>
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<tr>
<td>D+</td>
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<td>F</td>
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Attendance Policy
Participation in all classes is essential for your academic success, especially in NYU Berlin’s content courses that, unlike most courses at NYU NY, meet only once per week in a double-session for three hours. Your attendance in both content and language courses is required and will be checked at each class meeting. As soon as it becomes clear that you cannot attend a class, you must inform your professor by e-mail immediately (i.e. before the start of your class). Absences are only excused if they are due to illness, religious observance or emergencies. If you want the reasons for your absence to be treated confidentially and not shared with your professor, please approach NYUB’s Director or Wellness Counselor. Your professor or NYUB’s administration may ask you to present a doctor’s note or an exceptional permission from the Director or Wellness Counselor.

Unexcused absences affect students’ grades: In content courses each unexcused absence (equaling one week’s worth of classes) leads to a deduction of 2% of the overall grade and may negatively affect your class participation grade. Three unexcused absences in one course may lead to a Fail in that course. In German Language classes three (consecutive or non-consecutive) unexcused absences (equaling one week’s worth of classes) lead to a 2% deduction of the overall grade. Five unexcused absences in your German language course may lead to a Fail in that course. Furthermore, faculty is also entitled to deduct points for frequent late arrival to class or late arrival back from in-class breaks. Being more than 15 minutes late for class counts as an unexcused absence. Please note that for classes involving a field trip or other external visit, transportation difficulties are never grounds for an excused absence. It is the student’s responsibility to arrive at the announced meeting point in a punctual and timely fashion.

Exams, tests, deadlines, and oral presentations that are missed due to illness always require a doctor’s note as documentation. It is the student’s responsibility to produce this doctor’s note;
until this doctor's note is produced the missed assessment is graded with an F. In content classes, an F in one assignment may lead to failure of the entire class.

**Attendance Rules on Religious Holidays**
Members of any religious group may, without penalty, excuse themselves from classes when required in compliance with their religious obligations. Students who anticipate being absent because of any religious observance should notify the Director or Assistant Director for Academics in advance of the anticipated absence. If examinations or assignment deadlines are scheduled on the day the student will be absent, the Director or Assistant Director will reschedule a make-up examination or extend the deadline for assignments.

**Late Submission of Work**
(1) Written work due in class must be submitted during the class time to the professor.

(2) Late work should be submitted **in person** to the instructor or to the Assistant Director for Academics, who will write on the essay or other work the date and time of submission, in the presence of the student. Another member of the administrative staff may also personally accept the work, and will write the date and time of submission on the work, as above.

(3) Unless an extension has been approved (with a doctor's note or by approval of the Director or Assistant Director), work submitted late receives a penalty of 2 points on the 100 point scale for each day it is late.

(4) Without an approved extension, written work submitted more than 5 weekdays following the session date fails and is given a zero.

(5) End of semester essays must be submitted on time.

(6) Students who are late for a written exam have no automatic right to take extra time or to write the exam on another day.

(7) Please remember that university computers do not keep your essays - you must save them elsewhere. Having lost parts of your essay on the university computer is no excuse for a late submission.

**Plagiarism Policy**
The presentation of another person's words, ideas, judgment, images or data as though they were your own, whether intentionally or unintentionally, constitutes an act of plagiarism. Proper referencing of your sources avoids plagiarism (see as one possible help the NYU library guide to referencing styles: http://nyu.libguides.com/citations).

NYUB takes plagiarism very seriously; penalties follow and may exceed those set out by your home school. All your written work must be submitted as a hard copy AND in electronic form to the instructor. Your instructor may ask you to sign a declaration of authorship form.

It is also an offense to submit work for assignments from two different courses that is substantially the same (be it oral presentations or written work). If there is an overlap of the subject of your assignment with one that you produced for another course (either in the current or any previous semester), you MUST inform your professor.
For a summary of NYU Global's academic policies please see: www.nyu.edu/global/academic-policies

Required Text(s)
This book can be bought at Saint Georges in Wörther Straße 27 near NYUB. One copy of the book's current edition is on reserve in NYUB's Reading Room.

Supplemental Text(s) (not required to purchase)
*For those of you interested in additional general reading, these books have been recommended by NYU faculty (you will find some of them in NYUB's Reading Room):*

- Dubin & Somparrac, _How the Brain Works_, Blackwell.
- Gregory, _Eye and Brain_, McGraw-Hill.
- Hubel, _Eye, Brain, and Vision_, Freeman.
- Churchland and Sejnowski, _The Computational Brain_, MIT Press.
- Churchland, _The Engine of Reason, the Seat of the Soul_, MIT Press.
- Bruce, Green, and Georgeson, _Visual Perception_, Erlbaum.
- Kuffler, Nicholls, and Martin, _From Neuron to Brain_, Sinauer.
- Nalwa, _A Guided Tour of Computer Vision_, Addison-Wesley.
- Roederer, _The Physics and Psychophysics of Music_, Springer-Verlag.
- Howard & Rogers, _Seeing in Depth_, Oxford.

**Internet Research Guidelines**
to be discussed in class

**Additional Required Equipment**
n/a

**Schedule**

**Session 1 – 01 Sep 2015**
*Introduction to Sensation and Perception*
Motivation to study Perception, Physiology of Perception
Required reading: None.

Session 2 – 08 Sep 2015
Psychophysics and the Signal Detection Theory
(Psychophysical methods and their fundamental assumptions)
Required reading: Goldstein Chapter 1/Appendix

Session 3 – 15 Sep 2015
Optics of the Eye and the Retina
(Transduction, Adaptation, Basic Visual Functions, Lightness, Acuity)
Required reading: Goldstein Chapter 3

Session 4 – 22 Sep 2015
Visual Cortex and Beyond
(Topography, Division of Labor, Cortical Receptive Fields and Columnar Structure)
Required reading: Goldstein Chapter 4

Session 5 – 29 Sep 2015
Color and Motion
(Physiology and Perception of Color and Motion)
Required reading: Goldstein Chapters 8 and 9

First response paper due.

Session 6 – 06 Oct 2015
Seeing in 3D
(Binocular Vision and Space Perception)
Required reading: Goldstein Chapter 10

Session 7 – 13 Oct 2015
Midterm Exam
Topics: Content of sessions 1 through 6

20 Oct 2015 – Fall Break – No Class

Session 8 – 27 Oct 2015
Workshop on active perceptual memory at Humboldt University of Berlin
Required Co-Curricular Activity
Required reading: none

Session 9 – 03 Nov 2015
Visual Selection
(Attention and Eye Movements)
Required reading: Goldstein Chapter 6, Findlay & Gilchrist, 2003, Chapter 1

**Session 10 – 10 Nov 2015**

**Visual Recognition**
(Objects and Scene Perception, Animacy, Causality, and Events)
Required reading: Goldstein Chapter 5, Scholl & Tremoulet, TiCS, 2000

**Session 11 – 17 Nov 2015**

**Hearing Basics**
(Sound, the Ear, Pitch, Loudness)
Required reading: Goldstein Chapter 11

**Session 12 – 24 Nov 2015**

**Auditory Processing**
(Auditory Pathways and Localization, Auditory Scenes, Speech and Music)
Required reading: Goldstein Chapters 12 and 13

**Session 13 – 01 Dec 2015**

**The Skin and its Senses**
(Touch, Temperature, Pain)
Required reading: Goldstein Chapter 14

Second response paper due.

**Session 14 – 08 Dec 2015**

**Chemical Senses**
(Taste and Smell)
Required reading: Goldstein Chapter 15

**Session 15 – 15 Dec 2015**

**Final exam**
Topics: Content of sessions 8 through 14

**Classroom Etiquette**

*Class and Classwork:*
Please read the book (it's very good!) and come to the lectures (they should be fun)! You are responsible for material covered in the lectures even if it is not in the textbook, and you are responsible for the material in the textbook even if it has not been covered in the lectures. Please ask questions during class. I will try to stop every once in a while to make sure that everyone is with me. However, it is your responsibility to ask a question, if only to slow me down. Please don't worry about asking a "stupid" question. Chances are that other students in the class are also confused.
Office Hours:
There are no fixed office hours. I will schedule appointments with you individually upon your request. When asking for an appointment, please send me an email, listing several possible days/times for an appointment, or talk to me after class.

Announcements:
Check the course web pages on NYU Classes (https://newclasses.nyu.edu/) regularly for announcements, information about exams and review sessions, grades, and changes to the schedule. You are responsible for finding out about this information.

Required Co-Curricular Activities
On Tuesday, 27 October 2015, my colleagues and I will be hosting a workshop on active perceptual memory at Humboldt University Berlin. The workshop features many internationally noted scholars in the fields of active vision and perceptual memory. This will be an exciting opportunity for you to participate in a highly topical scientific meeting and to see and hear scientists of great renown. Participation is required during two afternoon lectures. The specific times and information about the venue will be provided in class at the beginning of the semester. You are also welcome to participate in the entire two-day workshop (from Monday to Tuesday), but it will not affect your grade if you just come for the required two lectures.

Suggested Co-Curricular Activities
To be discussed in class

Your Instructor
Dr. Martin Rolfs studied Psychology at Potsdam University (Germany) where he completed his PhD in 2007. As a postdoctoral scientist, he worked at the Université Paris Descartes (France), New York University (USA), and Université Aix-Marseille (France). In 2012 he started his own research group at Humboldt University of Berlin, which investigates active visual perception and cognition. Dr. Rolfs has been teaching courses in perception and cognition for many years, both in the US and in Germany.