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| <b>Course Code</b>    | HP3603  |
| <b>Course Title</b>   | Sensation & Perception  |
| <b>Pre-requisites</b> | HP1000 Introduction to Psychology<br>HP1100 Fundamentals of Social Science Research |
| <b>No of AUs</b>      | 3   |

### Course Aims

The purpose of this elective course is to discover the exciting science of sensation and perception. The brain processes huge amounts of data coming in through our eyes, ears, nose, skin, etc. How does the brain make sense of all this information? This course will focus mainly on visual perception, and cover questions such as: Why do insect eyes look so different from ours? Why does the moon look so big when it's near the horizon? Why can't I see when I walk into a movie theater from a bright sunny day? How can a tennis player hit a hard serve traveling at 120 km/h? Why do some people see that dress as white-gold and others as blue black? What do the brains of blind people process? In understanding the visual system, we will learn common principles of brain function relevant for the other senses, and for understanding human cognition and behavior in general. Perception science has a long tradition and is a great example for interdisciplinary science, involving the fields of psychology, philosophy, biology, physiology, medicine, anthropology, physics, computer science, and art. In this course, we will cover many aspects of visual experience from many angles, including theories, underlying neural mechanisms, and their scientific evidence.

### Intended Learning Outcomes (ILO)

By the end of this course, you should be able to:

1. explain how humans and other animals take in and interpret information from the physical world,
2. understand the basic neural mechanisms involved in sensation and perception,
3. analyse scientific experiments on visual perception and visual illusions,
4. appreciate your everyday perception of your surroundings in new ways.

### Course Content

Light, Optics, & Eyes; The Retina; Neurons & Neural Codes; Modules & Maps in the Brain; Patterns & Shapes; Surfaces & Objects; Lights & Shadows; Object Recognition; Scene Depth; Binocular Vision; Motion; Colour; Hearing; Music; Touch & Haptics; Attention & Consciousness; Multisensory Integration

### Assessment (includes both continuous and summative assessment)

| Component                  | ILO Tested | Weighting | Team/Individual |
|----------------------------|------------|-----------|-----------------|
| 1. Weekly in-class quizzes | 1, 2, 3    | 10%       | Individual      |
| 2. Group Project           | 3, 4       | 40%       | Team            |
| 3. Test 1                  | 1, 2, 3    | 25%       | Individual      |
| 4. Test 2                  | 1, 2, 3    | 25%       | Individual      |
| Total                      |            | 100%      |                 |

### Formative feedback

You will receive feedback on your verbal contributions in class, and you can always approach the instructor during breaks, after class, or in office hours for in-person advise on your learning progress.

In-class quizzes: Responses and common mistakes will be discussed in the following week.  
 Test 1 and Test 2: Summative feedback on the performance of the group will be provided in the week after the test or via NTULearn, including discussions of common mistakes.  
 Group Project: Your group will meet with the instructor to discuss you plans for experiments and receive hints as to how to write a successful report.

**Learning and Teaching approach**

Classes will consist of a mix of lectures, seminar discussions, and activities (3 hours per week). Attendance of the classes is mandatory. The material for the tests is covered in the lecture slides. The textbook is strongly recommended for background reading and to supplement the lecture materials.

| Approach                               | How does this approach support you in achieving the learning outcomes?  |
|--|---|
| Reading                                | The material can be dense, especially in the first half of the semester, and especially for students that did not previously take Biological Psychology or have less background in Biology from their previous education. It is therefore highly recommended to complete the reading <i>before each class</i> . |
| Lectures                               | The Lectures will provide an overview of each topic and the instructor is always happy to entertain questions. The Lectures and Lecture Notes (provided ahead of each class meeting) contain all the information required for performing successfully in the tests and quizzes.                                 |
| In-class Demonstrations and Activities | Many of the concepts in class will be demonstrated using entertaining in-class demonstrations, including perceptual illusions. You should keep in mind their informative nature, and question what they tell us about how the human brain processes information.  |
| Group Project                          | In the group project, you will pick an example from your own perceptual experience and investigate this in a scientific manner by conducting a (small) experimental study. This will provide you invaluable insights into how the concepts of this course are directly derived from scientific experimentation. |

**Reading and References**

Textbook:  
 Wolfe, J. M., et al. (2014). *Sensation & Perception (4th Ed.)*. Sinauer. ISBN: 978-1-60535-211-4  
 ... or the more recent 5<sup>th</sup> edition (including International Edition)

**Course Policies and Student Responsibilities**

(1) General

You are expected to complete all assigned pre-class readings and activities, attend all classes punctually and take all scheduled assignments and tests by due dates. You are expected to participate in all seminar discussions and activities.

## (2) Absenteeism

If you know in advance that you are going to miss a test for a legitimate reason (e.g. scheduled medical operation), please inform the instructor as soon as possible. Possibly, you may take the test at an earlier date. If you miss a test due to an unforeseen medical emergency, you can submit a medical certificate (MC) to the instructor after the assessment (up to maximally 2 weeks after the test, as scheduled). Late MCs will not be accepted. The instructor will inform you of the follow-up arrangement if you have provided a valid MC for a missed test on time.

## **Academic Integrity**

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

**Planned Weekly Schedule**

| <b>Week</b> | <b>Topic</b>   | <b>ILO</b> | <b>Readings/ Activities</b> |
|-------------|--|------------|-----------------------------|
| 1           | Introduction<br>Light, Optics, & Eyes                  | 2, 3, 4    | Chapter 1, 2                |
| 2           | Retina<br>Neurons & Neural Codes                       | 1, 2, 3    | Chapter 2                   |
| 3           | Modules & Maps<br>Patterns & Shapes                    | 1, 2, 3    | Chapter 3                   |
| 4           | Surfaces & Objects<br>Lights & Shadows                 | 1, 2, 3    | Chapter 4                   |
| 5           | Object Recognition                                     | 1, 2, 3, 4 | Chapter 4                   |
| 6           | Scene Depth<br>Binocular Vision                        | 1, 2, 3, 4 | Chapter 6                   |
| 7           | <b>Test 1</b><br>Motion                                | 1, 2, 3, 4 | Chapter 8                   |
| 8           | Colour   | 1, 2, 3, 4 | Chapter 5                   |
| 9           | Hearing<br>Music                                       | 1, 2, 3, 4 | Chapter 9-11                |
| 10          | Touch & Haptics  | 1, 2, 3, 4 | Chapter 13                  |
| 11          | Multisensory Integration                               | 1, 2, 3, 4 | Chapter 13                  |
| 12          | Attention & Consciousness<br><b>Project report due</b> | 1, 2, 3, 4 | Chapter 7                   |
| 13          | <b>Test 2</b><br>Recap and Summary                     |            |                             |