

# Sensory Processes

Fall 2007

## Course Outlines

**Course Instructor:** Dr. Ullal, G.

**Contact:** Department of Psychology, Neuroscience and Behaviour.

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Office Hours: *There are no specific “Office Hours”. Please feel free to email any one of us and make an appointment for any day during the week. Around the mid-term examinations and before the final examination special time-slots will be provided.*

**Lectures:** Tue, Thu and Fri 8:30 am -9:20 am

**Teaching Assistants (Email and office-contacts will be provided):**

1. Sayegn Riziq email: [sayeghr@mcmaster.ca](mailto:sayeghr@mcmaster.ca)
2. Aruffo Chris: [nospam@aruffo.com](mailto:nospam@aruffo.com)
3. Depape Ann Marie: [depape@yorku.ca](mailto:depape@yorku.ca)

### **Course Description and Objectives:**

Basic survival of an organism relies upon its knowing the world that surrounds it. The fundamental system that underlies this knowing is what “Sensory Processes” is all about. Perhaps, it may not be an exaggeration to state that in sensory mechanisms one sees the ‘constant endeavor’ of human consciousness to explore the world around. Exploring this is indeed an exciting task. The ever-growing tools of investigation make this attempt even more fascinating. Further, the clinical vignettes serve as ‘road-maps’ for our exciting and ambitious journey towards understanding the brain through Sensory Processes.

### **Textbook:**

The text that may offer a helpful support for the course is “*Sensation and Perception*” –E B Goldstein (7<sup>th</sup> Edition) Wadsworth Publication.

**NOTE:** Examinations are based on lectures. The lectures will cover material from the textbook as well as from outside sources. Important PowerPoint slides for the lecture will be posted prior to every class. Students are advised to make their own notes in class.

**Journal Articles for Home-Assignment:** Besides the textbook, two journal articles will be reviewed in the course. The PDF format of the papers will be posted at an appropriate time during the course.

**Assignment #1:** Gerald H Jacobs, Gary A Williams, Hugh Cahill and Jeremy Nathans. Emergence of novel color vision in mice engineered to express a human cone photopigment. *Science*, 315, 1723-1725, (2007).

**Assignment #1 is due on: 23<sup>rd</sup> October 2007**

**To be submitted to: (Will be announced)**

**Assignment #2:** Zhihua Zou, Fusheng Li, Linda B Buck. Odor maps in the olfactory cortex. *Proceedings of National Academy of Sciences*, 102, 7724-7729, (2005).

**Assignment #2 is due on: 23<sup>rd</sup> November 2007**

**To be submitted to: (Will be announced)**

**NOTE:**

- a. Students are required to study the article and address a few questions pertaining to it in the form of home-assignments. The questions will be provided.
- b. Both the assignments **together**, will be worth **20%** of the final grade.
- c. **The assignments must be submitted to the allotted TA prior to the specified dates.** A penalty of 10% /day will be applied for delayed submission. By 3<sup>rd</sup> day, the assignment will get a zero. In the event of an illness or any legitimate reasons, an official permission should be routed through the Administration excusing the delayed submission.
- d. The assignments must be typed, with double-line spacing. Emailing of assignments is not permitted.
- e. Language will not be an issue in the marking. Point-form of answers would do.

## Evaluations

1. **First midterm examination:** The midterm examinations will be worth **20%** of the final grade. Only material covered in class in all the lectures prior to 1<sup>st</sup> midterm examination will be on 1<sup>st</sup> midterm examination. Besides **multiple choice questions** there will be a few **short answer** type questions comprising of definitions and some important concepts discussed in class.
2. **Second midterm examination:** The midterm examinations will be worth **20%** of the final grade. Only material covered in class in all the lectures after the 1<sup>st</sup> midterm examination and prior to 2<sup>nd</sup> midterm examination will be tested. Besides **multiple choice questions** there will be a few **short answer** type questions comprising of definitions and some important concepts discussed in class.
3. **Final examination:** It will be worth **40%** of final grade. It will test the material covered in the entire course with a greater emphasis on what is covered after the 2nd midterm examination. This will be entirely based on **multiple-choice questions (there will not be short-answers on the final examination)**. Dates for the midterm examinations are indicated in the List of Lectures below. Date for the final examination will be determined by the Registrar's Office.
4. **Assignments:** There will be **TWO** home assignments, **together** worth **20%** of the final grade. They will be based on two journal articles listed below. **They have to be submitted to the TAs by the absolute deadline indicated above as well as in the table of schedule provided below.**

**NOTE:** A penalty of 10% /day will be applied for delayed submission. By 3<sup>rd</sup> day, the assignment will get a zero. In the event of an illness or any legitimate reasons, an official permission should be routed through the Administration excusing the delayed submission.

**Remarking of Assignments or Short Answers:** Requests for remarking of an Assignment or a Short Answer is only considered after a student provides a written request giving the reasons for the request to either, Dr. Ullal or the concerned TA.

**MISSED EXAMINATIONS:** There will **NOT** be a re-examination for missing any of the midterm examinations. However, if a student misses any examination owing to an illness or any other legitimate reason, the final examination will be rated proportionately higher provided an official permission is routed through the University Administration. No examination will be re-scheduled unless there is cancellation of the class by the University.

**CONFLICT OF EXAMINATIONS:** Both the midterm examinations are conducted during the regular class-hour. If any other examination conflicts with this examination, please contact the authorities conducting the other examination.

**“IMPORTANT ANNOUNCEMENTS”:** Important announcements regarding the course will be periodically posted in the **Announcement Box** of the course. Please remain updated.

**MCMASTER UNIVERSITY GRADING SCALE:**

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49

## Schedule of lecture topics and reading

### NOTE

1. **First midterm examination will cover all material taught in class from first day of class till the last lecture (inclusive) before the 1<sup>st</sup> midterm examination.**
2. **Second midterm examination will cover all material taught after the 1<sup>st</sup> midterm examination till the last lecture (inclusive) before the 2<sup>nd</sup> midterm.**
3. **Final examination is cumulative of entire material taught in the course.**
4. **The topics listed below will follow the dates against them approximately.**

- 7<sup>th</sup> September: Course Outline
- 11<sup>th</sup> –14<sup>th</sup> September: Introduction to the study of sensory and perceptual processes.  
Chapter 1
- 18<sup>th</sup> September: Organization of the Sensory system (partly Chapter 2)
- 20<sup>th</sup> September: Investigating the Sensory function (partly Chapter 1)
- 21<sup>st</sup> –27<sup>th</sup> September: Introduction to the Visual System Receptors and Neural Processing. Chapter 2
- 28<sup>th</sup> -September –4<sup>th</sup> October: The Lateral Geniculate Nucleus and Striate Cortex-- anatomy, physiology, and perceptual processing of the central visual system. Chapter 3
- 5<sup>th</sup> –9<sup>th</sup> October: Higher Level Visual Processing -- parallel processing streams and specialized neural processing of visual stimuli. Chapter 4.
- 11<sup>th</sup> October: **1<sup>st</sup> Midterm examination** 8:30 am to 9:30 am
- 12<sup>th</sup> –16<sup>th</sup> October: Colour vision- Physiological and psychophysical studies Chapter 7.

### **(Introducing the paper for Assignment #1)**

- 18<sup>th</sup> October: Perceiving Objects-extraction and recognition of features and objects in the visual environment. Chapter 5
- 19<sup>th</sup> October: Visual Attention. Chapter 6
- 23<sup>rd</sup> October: Perceiving Depth and Size -- various cues to depth and the underlying physiological mechanisms. Chapter 8

### **Assignment #1 is due on 23<sup>rd</sup> October**

- 25<sup>th</sup> October: Perceiving Movement -- eye movements, vestibular system; the detection and discrimination of objects moving in the environment. Chapter 9

- 26<sup>th</sup> October: Physiological link between sensory inputs and motor functions Chapter 10
- 30<sup>th</sup> October-2<sup>nd</sup> November: Auditory system -- sound; structure of the ear and arrangement of the central auditory pathways. Chapter 11
- 6<sup>th</sup> November: Sound Localization and the Auditory scene. Chapter 12
- 8<sup>th</sup> November: Speech Perception. Chapter 13
- 9<sup>th</sup> November: Vestibular system and sense of posture (Not in text)
- 13<sup>th</sup> November: **2<sup>nd</sup> Midterm examination** 8:30 am to 9:30 am
- 15<sup>th</sup> –16<sup>th</sup> November: The Chemical Senses -The anatomy, physiology, and psychophysics of the sensations of taste and smell. Chapter 15

**(Introducing the paper for Assignment #2)**

- 20<sup>th</sup> – 22<sup>nd</sup> November: The Cutaneous Senses-- the receptors, neural pathways, thresholds, and adaptation of the sensations of touch. Chapter 14
- 23<sup>rd</sup> November: Pain sensation. Chapter 14

**Assignment #2 is due on 23<sup>rd</sup> November**

- 27<sup>th</sup> November: Catch-up topics
- 29<sup>th</sup> and 30<sup>th</sup> November: Review of all material

**ACADEMIC INTEGRITY LANGUAGE FOR COURSE OUTLINES**

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at <http://www.mcmaster.ca/academicintegrity>

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group-work.
3. Copying or using unauthorized aids in tests and examinations.

**Message from the Chair of Psychology**

The Instructor cannot be responsible for returning long distance calls from students. Any student wishing to reach an Instructor is invited to e-mail the instructor.