

## Current Topics in Perception: Multisensory Integration

### I) Course information

Course number: PSYD51H3

Thursdays, 3-5pm  
Place: BV361

Prerequisites: PSYB51, [0.5 credit from the PSYC50-series of courses] or NROC64H3

### II) Instructor:

Dr. Matthias Niemeier  
1265 Military Trail S572  
phone: 416-287-7466  
e-mail: niemeier@utsc.utoronto.ca  
Office Hours: Fri, 12-1 pm. Also, I will have special office hours for everyone to help with preparations for their presentation in class. I request to please approach me about this at least one week before your presentation.

### III) Course coverage and goals

The world around us is multimodal. How do we join our senses (vision, audition, touch, olfaction, balance etc.) together to obtain a coherent percept of the world? In the past few years, multisensory integration has become a topic of major research interest. The course provides a survey of the recent developments. Selected readings will cover neurophysiological results, psychological and neuropsychological findings, synaesthesia, and an introduction to the Bayesian mechanisms of multisensory integration.

On a more general level PSYD51 is modeled after seminar courses in grad school as well as lab meetings in research labs. As such PSYD51 provides training in reading and understanding scientific articles, oral and written scientific communication, critical thinking, and grant writing.

### IV) Web pages

#### Course Web Site: BlackBoard

Here you will find the syllabus, instructions for the papers, the most up-to-date version of the lecture schedule, and announcements.

Please check on a regular basis for announcements.

### V) Evaluation

One aim of this course is to be closer to the real world of science than that is possible in a lecture. That is, **there won't be exams nor a textbook**. There won't even be a regular lecture. Instead, your presence in class and **active** participation in the course is expected and will be a significant part of the grade. We will have a reading list of original research papers (2 per week), and every week there will be presentations and discussions on them. Also, we will have assignments; every week a short thought paper on one of the research papers from the reading list, and at the end of the course there will be a research proposal on a topic of multisensory integration.

**30% Presentation.** On one day you are asked to present one of the research papers for the respective day. The quality of your presentation will be crucial for your own and for everyone else's learning experience. You can earn these 30% within 20-25 min, which is the length of your presentation. To be successful it needs to be a free presentation. You can use notes, but reading from a manuscript just doesn't work for your audience. The exact structure of the presentations will vary from article to article. But it should have the following parts:

- (a) a brief introduction to the topic (up to 5 min)
- (b) a summary of the methods, results and conclusions of the paper. (~15 min)
- (c) a summary of the discussion of the article (up to 5 min)

A group discussion will follow your presentation (not part of your grade).

To choose a topic, please refer to the Schedule and the reading list. Topics will be assigned on a first-come-first-serve basis. Please email me your first 3 choices. Please contact me to set up a 1-hr appointment with me to prepare for your presentation.

**30% Active participation in the group discussions.** Every week you are expected to read the respective literature (2 papers) so that you are properly prepared to engage in discussions on them. The 30% emphasize that I value participation very much. Science lives from discussions. For this seminar it means that you need to say something in class that pertains to the respective topic. No worries, you don't need to make genius comments in class (but it doesn't hurt, of course). It is perfectly fine to convey any kind of thought of your own. For example: Do you agree with the authors? Do you have concerns about confounds or gaps in the study? Or maybe, were you impressed with something about the study? Do you have ideas about how to extend the research? Anything from your thought paper (see below) that you might want to share? Even if there was something in the paper that you didn't understand that could be worth talking about. There is a good chance that others had the same problem (but you get the credit for bringing it up). – Our discussions can be about many different things, and you will get a point for every session during which you contribute to those discussions. Speaking of "every session". Part of participating implies that you are present. Every week. That's the hitch of having no exams and no textbook. For more than one missed session I will need to factor this in, unless I receive medical certificates from you.

**20% Five thought papers (4% each).** Having read the weekly literature (2 papers) you also need to write thought papers about some of these articles. That means **2 double-spaced pages of your own thoughts**. The purpose is (a) to encourage you to read the literature carefully and to prepare for the respective session of course (e.g., you may write a paper about a great idea and bring that same idea up during class), (b) to practice scientific writing, (c) to encourage you to develop your own thoughts on the particular topic. Thought papers need to be submitted for the respective session during which the respective article is being discussed (email submission before the start of the class; a deduction of 10% per every 24h of late submission). Please note that thought papers need to be structured in a specific way, see instructions on BlackBoard ("**How to write a thought paper**").

Also, we cannot have all thought papers submitted towards the end of the course. Neither could I read that many papers all at once, nor could I offer you timely feedback; what is worse, quite a few people would be unable to complete their work. Therefore, please submit thought papers according to the following schedule:

- Thought paper 1: session 2, 3, or 4
- Thought paper 2: session 5 or 6
- Thought paper 3: session 7 or 8
- Thought paper 4: session 9 or 10
- Thought paper 5: session 11 or 12

You can make up for grades for up to 2 thought papers, on the condition that the make-up paper is submitted during the same time period. That is, if you submit a paper for session 7 and another paper for session 8, then I will take the better of the two grades to count as your “thought paper 3 grade.” However, a grade for a paper submitted for session 9 can only count as paper 4 grade, it cannot count as paper 3 grade.

**20% Research proposal.** The proposal is due on the last day of classes. Please go to BlackBoard for tips and instructions on “**How to write a research proposal**”.

## VI) Schedule

The schedule is subject to changes as we go along. The most up-to-date version will be on the Intranet.

Week	Topic	Literature
1	Introduction	--
2	Neural mechanisms of multisensory integration	Hummel & Gerloff (2005), Bremmer et al. (2001)
3	Crossmodal cueing of attention	Spence & Driver (1997) Ward et al. (2000)
4	Multisensory object perception: behaviour	Newell et al. (2001), Lacey et al. (2007)
5	Multisensory object perception: fMRI	Amedi et al. (2001) Amedi et al. (2007)
6	Optimal multisensory integration: psychophysics and models	--- <i>Introduction to Maximum Likelihood Estimation</i> --- Ernst et al. (2002) Deneve et al. (2001)
7	Vision and sound in space	Alais & Burr (2004), Fujisaki et al. (2004)
8	Vision and sound / touch in space	Zwiers et al. (2003), Macaluso et al. (2002)
9	Multisensory integration and action	Tremblay & Nguyen (2010) Juravle et al. (2010)
10	Body schema	Blanke et al. (2005) Rousseaux et al. (2013)
11	Plasticity & development	Wallace et al. (2004), Gori et al. (2008)
12	Plus and minus syndromes of multisensory perception: A crossmodal illusion vs. autism	Dieter et al. (2014), Ross et al. (2015)

## VII) References

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### **VIII) Course Policies**

For academic regulations (such as UTSC's official grading practices policy, petitions, code of behaviour on academic matters etc.) please refer to the UTSC calendar.