

# Measuring Behavior - PSYCH 3PA3

## Course Syllabus

**Instructor:** Boris Sakic, *Associate Professor*  
Psychology building, PC303  
e-mail: [sakic@mcmaster.ca](mailto:sakic@mcmaster.ca)

**Teaching Assistant:** James Morrison, *MSc Candidate*  
[morrija3@mcmaster.ca](mailto:morrija3@mcmaster.ca)

**Office hours:** Wednesdays after 6 p.m. (by appointment via e-mail)

**Term 1:** September 9 – December 4, 2013

**Lectures:** Mondays 15:30-17:20 (ABB162); **Tutorials:** Wednesdays 16:30-17:20 (ABB162)

### Course Description:

“Measuring Behavior” is aimed at undergraduate psychology students who are about to embark upon experimental and clinical studies of behavior. This course covers basic principles and methods of quantitative behavioral analysis, with an emphasis on techniques of observation, recording, and inferential statistics. Moreover, it provides theoretical framework for further, direct involvement in behavioral experiments related to biomedical and social sciences. A didactic, multimedia-rich approach will be combined with thematic discussions from selected scientific literature. To facilitate the learning process, we will also review animal and human studies that employ different methods in behavioral analysis. We will test our knowledge by discussing methodological approaches and implications of these studies for better understanding of behavior in health and disease.

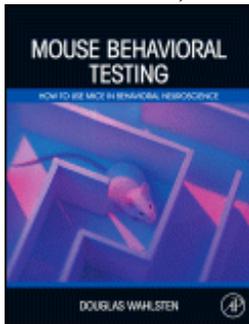
### Course Objectives:

By the end of this course students should be able to:

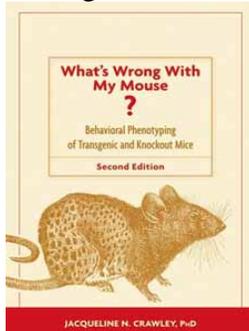
- recognize general principles of measuring behavior in experimental animals;
- develop awareness about the complexities of data collection and the interpretation of behavioral results;
- design behavioral methodologies, understand research terminology and become acquainted with equipment and software packages required for collection, analysis, and presentation of behavioral results;
- develop presentation skills using the PowerPoint software.

**Textbooks used in the course preparation (not mandatory):**

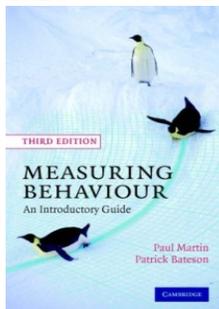
1. Douglas Wahlsten (2011). Mouse Behavioral Testing: How to Use Mice in Behavioral Neuroscience, Elsevier/Academic Press. ISBN: 978-0-12-375674-9



2. Crawley J.N. (2007). What's Wrong With My Mouse? Behavioral Phenotyping of Transgenic and Knockout Mice, John Wiley & Sons. ISBN: 978-0-471-47192-9



2. Martin P & Bateson P. (2008). Measuring Behavior, Cambridge University Press. ISBN: 978-0-521-82868-0



### Course Format

A significant portion of the material will be presented in a didactic manner. However, the course format is designed to facilitate self-directed learning, critical thinking, and independent inquiry. Therefore, the lectures will be interactive; the instructor will ask you questions related to a given topic and encourage you to ask questions. Similar to students, the instructor may not be able to answer a question posed during the lecture. In those cases, he will take it as a challenge to have an answer for the next session.

Students are responsible for collecting the material presented in lectures and in tutorial sessions. Tutorials will be used to supplement lectures and to provide more detailed examples, problems and demonstrations of relevant course material.

Measuring Behavior (PSYCH 3PA3) - Fall 2013	
<i>List of Topics</i>	
<b>Week 1 (Sept. 9)</b>	Intro, course outline, why measure behavior, ethical considerations
<b>Week 2 (Sept. 16)</b>	The steps involved in studying behavior
<b>Week 3 (Sept. 23)</b>	Laboratory mouse - physiology, behavior, & procedures
<b>Week 4 (Sept. 30)</b>	Assessments of neurological functions
<b>Week 5 (Oct. 7)</b>	Assessments of emotional reactivity and motivated behavior
<b>Week 6 (Oct. 14)</b>	<i>Thanksgiving Monday</i> and Assessments of learning / memory
<b>Week 7 (Oct. 21)</b>	Assessments of learning / memory and <i>Essay 1 due Oct. 23<sup>rd</sup></i>
<b>Week 8 (Oct. 28)</b>	Computerized measurement of behavior
<b>Week 9 (Nov. 4)</b>	Fever, neuroinflammation, and sickness behavior
<b>Week 10 (Nov. 11)</b>	Behavioral research design and data analysis
<b>Week 11. (Nov. 18)</b>	Critical Reasoning Exercise 1
<b>Week 12. (Nov. 25)</b>	Critical Reasoning Exercise 2
<b>Week 13. (Dec. 2)</b>	<i>Preparations for the final exam and Essay 2 due Dec. 4<sup>th</sup></i>

**Final exam: Dec. 6<sup>th</sup>, 2013, 12:30 pm**

**Evaluation:** The course will focus on promoting creative thinking and curiosity required for measuring animal behavior. Students will select a behavioral report of their choice, which will constitute the conceptual basis for two take-home essays (**copy of the report needs to be stapled to both essays**). The essays aim to develop the students' analytical skills in the context of experimental design, methodology used, and interpretation of results. The first essay is due October 23<sup>th</sup> (by 5:20 p.m.) and focuses on critical analysis of behavioral measures and paradigms in the report selected. Although this first essay will be critically appraised, the mark will not carry any weight. However, it will be used as a starting point for improvements in the second essay, which is due December 4<sup>th</sup> (by 5:20 p.m.). The second essay will address issues from Essay 1 (as per feedback from the instructor), while further focusing on data analysis, statistical tests employed, and interpretation of the results. The final, written examination (December 6<sup>th</sup>, 2013) will consist of twenty short answer questions related to course material and five questions that will probe experimental design skills. The use of calculators, books, and notes is prohibited during the final exam; a pencil and eraser are all that will be required.

**Essay 1 - focus on experimental design and methodology****Essay 2 - focus on data analysis and interpretation****Part 1 (paper summary, ~ 2 pages)**

1. **Rationale / Hypothesis:** What was the health/research problem and what evidence led to working hypothesis?
2. **Methodology:** Briefly describe subjects, techniques, paradigms, and measures used to assess biological phenomenon studied.
3. **Results:** Summarize key findings and observations.
4. **Conclusions:** What inference was drawn from the results obtained? What is the position of authors with respect to importance and applicability of their findings?

**Part 2 (your critical feedback, ~ 2 pages) You may address the following questions:**

1. Is working hypothesis well defined? Is this health/research problem legitimate, with clear implications to human disease or a better understanding of brain function?
2. Who were the subjects and what behavioural measures were selected? Is rationale for selection of subject and measures, as well as **sample size**, clearly stated and justified? Are **dependent variables qualitative or quantitative**? **Is statistical analysis (i.e., choice of statistical tests) in accordance with experimental design and data distribution**? If other behavioural measures were employed, would they further contribute to a deeper understanding of behavioural phenomena studied?
3. How were behavioural tests performed? Are effects strain-, sex- or test-specific? Are there better models or methodological alternatives? Would a **larger sample**, other paradigms, or additional studies further improve scientific merit of the study?
4. **What inference was drawn from the results obtained? Are authors critical and unbiased in their discussion? Are there alternative interpretations and if so, what evidence is needed to corroborate alternative explanations and generate new hypothesis?**

**Part 3 – Study diagram (1 page), presenting the study visually (as a diagram or a flow chart)**

The essay should be divided into the following sections: *Title page, Rationale / Hypothesis, Methodology, Results, Conclusions Study Diagram and References*. The APA format should be used for in-text citations and bibliography (e.g., see the McMaster library <http://library.mcmaster.ca/guides/apa.htm>). The page limit for the text body is **4 double-spaced pages (an essay longer than 4 pages will be disqualified) and 1 page for Study diagram**. This restriction does not include the Title page, as well as unlimited space for References. In brief, print format is double-spaced, numbered pages with 1-inch margins and 12-point Times New Roman font used.

(For a more detailed description of how to critically analyse scientific papers please check this link: <http://www.science.mcmaster.ca/biopharm/images/files/undergraduate/critanal.pdf>).

**The Title Page needs to contain:**

- Title of the essay and essay number (1 or 2)
- Course name and number
- Student's name, ID number, and program
- Date

*Characteristics of a Good Essay*

These include: correct use of grammar and syntax; organization; clear, lucid and concise exposition of ideas (i.e. meaningful sentences); no repetitions, redundancies, or irrelevant details; logical flow of arguments (links are stated explicitly and make sense); literature review that demonstrates critical and imaginative reading (look at pro and con; proposal of own alternatives). The style, grammar, ease of reading, and tightness of logic will influence the overall impression of the essay and its evaluation (For a short book on good writing, consult: *The Elements of Style* by William Strunk, Jr., free online at <http://www.bartleby.com/141>).

**The final mark will consist of:**

Lecture attendance	35%
Essay 1	0%
Essay 2	40%
Final Exam	25%

**Note:** “Bonus points” (max. 9%) can be collected by participating in a weekly “Jeopardy” quiz (given before each new topic) and 2% for a **presentation of selected reading (maximum 1 presentation / student)**.

**McMaster's Grading Scale**

90–100	85–89	80–84	77–79	73–76	70–72	67–69	63–66	60–62	57–59	53–56	50–52	0–49
A+	A	A–	B+	B	B–	C+	C	C–	D+	D	D–	F

The instructor reserves the right to adjust the final marks up or down, on an individual basis, in the light of special circumstances and/or the individual's overall performance in the course. Students who are not satisfied with their final mark should approach the professor by submitting a two-page statement that explains the grounds of the appeal.

**Dates and deadlines:** The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with an explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email regularly during the term and to note any changes.

**Late assignments:** Assignments submitted beyond the deadline will not be accepted unless prior arrangements have been made with the instructor or TA.

**Makeup Exams:** If a student misses an exam, she/he will need to have a valid reason and be able to document this excuse in order to qualify for a makeup examination. Examples of legitimate excuses include sickness, religious holiday, and conflict with another McMaster University academic or sporting event. If a student skips an exam, hoping that an eventual excuse will become acceptable, she/he will receive a zero for that exam. Psych 3PA3 does not subscribe to proposals for “extra work” in mitigation of exam delinquencies. Except in the case of illness, a makeup exam will not be given unless arrangements are made with the course Instructor in advance of the regularly scheduled examination. In the case of minor medical illness lasting fewer than five days, student must report the illness using the McMaster Student Absence Form (MSAF) and contact the course instructor within 2 working days of the missed exam in order to qualify for a makeup exam. Note that the MSAF may only be used once per term and may not be used for the final exam. In the case of major medical illness, the student must submit a medical note to the Faculty office within 5 working days of the missed exam in order to qualify for a makeup exam.

**E-mail:** All students should have McMaster e-mail accounts. If another e-mail address is preferred, we will try to accommodate your request, but we cannot be responsible for the non-receipt of messages to students using non-McMaster e-mail addresses. Neither can the instructors be responsible for returning long distance calls from students. Any student wishing to reach an instructor should use e-mail.

**Seeking Help:** Students are encouraged to seek help from the Instructor and TA at any time.

**The following policies are necessary in order to be fair and equitable to all students:**

**Audio and Video Recordings:** The recording of lectures and exams (video or audio) is prohibited.

**Attendance:** Because the majority of the course will be based on discussion and presentations compiled from different readings, students are encouraged to attend all classes. If late, a student should not disrupt and/or disturb other students who are already seated. Talking during lecture or tutorials, and related disturbing behaviour, is inconsiderate and will not be tolerated. Students are not expected to schedule any travels during lectures, tutorials, or exams.

**Readings.** Students are expected to go beyond the memorization of facts in order to display an understanding of the material. They are also strongly encouraged to read the relevant text chapters and review articles after the lecture/tutorial devoted to that topic. The follow-up readings will help students to recall, synthesize and consolidate the material that was presented.

**Notes:** It is essential that students attend classes and develop proper note-taking skills. If lecture/tutorial is missed, it is the student’s responsibility to obtain the notes on this material from a classmate. Most of the material discussed in class can be found in the textbooks or by searching the web, albeit presented from a different perspective. Slides shown in class will not be posted on the web because of copyright restrictions. To consolidate their knowledge, students are encouraged to search the web to obtain additional information and/or pictures pertinent to a particular topic.

**Academic Dishonesty Policy Reminder:** Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and 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 kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at <http://www.mcmaster.ca/academicintegrity>.

The following illustrates (but it is not limited to) 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.

**Logistics:** McMaster University reserves the right to change course dates, assignments and their grading weights, and deadlines in case of an emergency, labor disruption, civil unrest/disobedience, etc.

### **Important Dates**

13 September 2013 (Friday): Last day for registration and adding or dropping courses

23 October 2013 (Wednesday): **Essay I due**

15 November 2013 (Friday): Last Day for cancelling the course without academic penalty

4 December 2013 (Wednesday, 4:00 p.m.): **Essay II due**

6 December 2013 (Wednesday, 12:30 – 3:30p.m.): **Final Exam** (room TBA)