Measuring Behavior Lab Course Syllabus
(3LA3)

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Teaching Assistants:
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Prerequisite: Measuring Behavior (3PA3) course and CAF key card (involving mandatory CAF courses, Environmental & Occupational Health Support Services on-line course, as well as Workplace Hazardous Materials Information System and Fire Safety courses)

Office hours: by appointment via e-mail
Term 2: January 15 – March 27, 2014
Lab: Wednesdays, Thursdays 11:30a.m.-2:30p.m., 2:30 p.m. – 5:30p.m. (B127B, B112)

Course Description:
The lab course “Measuring Behavior” is aimed at undergraduate psychology students who are in position to apply their theoretical knowledge from the 3PA3 course and embark upon experimental studies of animal behavior. This course covers basic methods of quantitative behavioral analysis in rodents, with an emphasis on contemporary techniques of observation, recording, and inferential statistics. Moreover, it provides methodological basis for behavioral phenotyping of experimental animals and development of disease models, both in academic and industrial settings.

Practical, hands-on approach will include:

A. Designing of a behavioral battery from selected behavioral protocols,
B. Animal marking / tattooing,
C. Use of behavioral apparatus and video-tracking software,
D. Statistical analysis and interpretation of behavioral data.

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

• Understand terminology in contemporary behavioral research and become familiar with equipment / software packages required for collection, analysis, and presentation of behavioral results;
• Design and execute behavioral protocols for measuring neurological function, locomotor activity, emotional reactivity, and learning/memory capacity in experimental mice;
• Develop awareness about richness of raw behavioral data, as well as complexity of
statistical analysis and interpretation of behavioral results.

**Required accessories:** Lab coat (*protective gloves and masks will be provided*)

**Textbooks used in the course preparation** (*not mandatory, available in Thode Library*):


**Course Format**

All procedures will be initially demonstrated by the instructor and his TA. It is expected that students develop their own technical and critical thinking skills by the end of the course. Students are responsible for taking notes and collecting / saving raw data in series of behavioral paradigms.

<table>
<thead>
<tr>
<th>Measuring Behavior - Winter 2014</th>
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<tr>
<td><strong>List of Topics</strong></td>
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<td><strong>Week 1.</strong> Lab orientation/forms, housing, handling, mouse identification: marking &amp; tattooing (homework: prepare data templates and flowchart of the experiment)</td>
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<td><strong>Week 2.</strong> Pre-lab (Chapter 3, p 43-60), Handling/Weighing/Food/Water, rectal temperature, experimental set up, EthoVision XT 8 overview. (tattooing cadavers)</td>
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**Week 3.** Pre-lab (Chapter 4, p 63-84), Handling/Weighing/Food/Water, Neurological function: reflexes (righting reflex, placing reflex, postural reflex, clasping reflex, basket test, geotaxis), and WM Cue, use of video equipment including MedPC IV. (tattooing cadavers)

**Week 4.** Pre-lab (Chapter 5, p 87-109), Handling/Weighing/Food/Water, & locomotion: beam walking, Rota-rod, olfactory tests, Observer XT, SAB1, WM Aq1. (light gaseous anesthesia, tattooing cadavers)

**Week 5.** Pre-lab (Chapter 10, p226-265), Handling/Weighing/Food/Water, Emotional reactivity (open-field, step-down, novel object), SAB2, WM Aq2 (light gaseous anesthesia, tattooing live animals)

**Week 6.** Reading week: voluntary practice – if required, instructors will be available at regular class times.

**Week 7.** Midterm exam; Pre-lab (Chapter 11, p267-289), Handling / Weighing/Food/Water, Motivated behavior (sucrose preference, running wheel), SAB3, WM Aq3

**Week 8.** Pre-lab (Chapter 6, p 111-163), Handling/Weighing/Food/Water, Learning and memory SAB4, WM Aq4

**Week 9** Pre-lab, Handling/Weighing/Food/Water, Computerized assessment of home cage behavior and locomotion; SAB5; WM Probe/Extinction

**Week 10.** Pre-lab, Handling/Weighing/Food/Water, data collection, analysis and graphing (FigP), report preparation, SAB Rev, WM AqCue

**Week 11.** WM AqReversal, (TBD: Demonstrations: blood and tissue collection vs. RefMan, SPSS, Scientific inference)

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**Final exam (March 28th, 2014, location: B127A, times to TBD)**

**Final report (uploaded to Avenue to Learn by 11:59 p.m. April 11th, 2014)**

**Evaluation:** The course focuses on development of practical skills required in measuring animal behavior. At midterm, students are expected to show competence in assessing reflexes, ambulatory levels, and emotional reactivity. At the final exam, students are expected to show proficiency in designing a behavioral battery, perform the testing, and analyze / interpret observed results.

*The final mark will consist of:*

- **10%** pre-labs, **15%** attendance, **15%** participation, **15%** midterm, **25%** final exam, **20%** final report (MS Word format).

The final report should be divided into sections: *Rationale, Methods, Results and Discussion.* To have a better grasp of experimental design, students are encouraged to present the study visually, either as a diagram, flow chart, or figure. The space limit for the body of the essay is 2 single-spaced pages, which does not include the Title page, bibliography, or figures/diagrams. Print format for the essay is single-spaced, 1" margins all around, pages numbered, and 12-point font.
The Title Page should contain:

- Title of the report
- Course name and number
- Student’s name and ID
- Date

**Characteristics of a Good Report**

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). The style, grammar, ease of reading, and tightness of logic will influence the overall impression of the essay and its evaluation.

**McMaster's Grading Scale**

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<th>Grade</th>
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<td>A+</td>
<td>90–100</td>
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<td>A</td>
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<td>A–</td>
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<td>B+</td>
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<td>B</td>
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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.

**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 TAs.

**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. This course 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 ask the course Instructor or TAs for help at any time if needed. In particular, students should contact their own TA for questions regarding material and Alejandra for administrative purposes and logistics.

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: Students should attend all tutorials. Students will not be allowed to access the lab 20 minutes after the beginning of the class. 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 tutorials and develop proper practical skills. If lecture/tutorial is missed, it is the student’s responsibility to obtain the notes on this material from a classmate. 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.

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.