Description: This course provides students with hands-on experience in the design, implementation, and analysis of research in experimental psychology. Issues of psychophysical scaling, counterbalancing, event timing, and randomization as well as display calibration, image formats, and hardware limitations relevant to experiment control will be considered. Some programming in Python and data visualization with GLX/GLE will be required.

Prerequisites: Minimum 65% average in completed PSYC courses; PSYC 3015 (315). At least one .5 credit from A3 category.

Format: This course consists of a weekly three hour lecture/workshop held on Tuesdays from 10:10am – 2:00 pm including project time and group discussion. http://www.trentu.ca/admin/mytrent/AcademicTimetable.htm

Required Resources:
- http://www.trentu.ca/academicintegrity
- see Readings and external Resources list below

Evaluation:

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Description</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test 1</td>
<td>(in class, paper &amp; pencil) Feb. 11: Weeks 1,2,3,4</td>
<td>30%</td>
</tr>
<tr>
<td>Project 1</td>
<td>(WebP) Image manipulation and Rating Collection</td>
<td>10%</td>
</tr>
<tr>
<td>Project 2</td>
<td>Classic Experiment Programming and analysis</td>
<td>15%</td>
</tr>
<tr>
<td>Project 3</td>
<td>Formal Methods Section for Project 2</td>
<td>15%</td>
</tr>
<tr>
<td>Final Project</td>
<td>Take-Home (DUE April 4, 10:00am)</td>
<td>30%</td>
</tr>
</tbody>
</table>

**Learning Outcomes:** Successful students in this course will be able modify sample programs and create new psychological test instruments using common computer-based experiment generation tools as is recommended for entrance in behavioural psychology graduate programs. Students will be able to perform multidimensional scaling analysis (up to 3 dimensions) to recover psychological concept maps and articulate scaling issues associated with non-metric data analysis. The psychophysical background of common audio and video storage formats as well as vision-science implications of fundamental differences in display technologies will be understood. Measurement theory and sampling issues surrounding data acquisition in social and psychological research will be explainable by successful students in clear and appropriate language.

**Withdrawal:** Mark from Test 1 will be available by Feb. 28 (one week prior to deadline for withdrawal without academic penalty)
## Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Coverage</th>
<th>notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan.  7</td>
<td>Psychological Sci. Measurement/Theory</td>
<td>ER2</td>
</tr>
<tr>
<td>2</td>
<td>Jan. 14</td>
<td>Computers In Experimentation, Python</td>
<td>ER1, ER4</td>
</tr>
<tr>
<td>3</td>
<td>Jan. 21</td>
<td>PsychoPy &amp; Psych Measurement</td>
<td>Pierce, ER9</td>
</tr>
<tr>
<td>4</td>
<td>Jan. 28</td>
<td>Using Images/Sounds in Experiments</td>
<td>ER6, ER7, ER8(CH22,23), ER12</td>
</tr>
<tr>
<td>5</td>
<td>Feb.  4</td>
<td>Using Images/Sounds in Python</td>
<td>ER10, ER11</td>
</tr>
<tr>
<td>6</td>
<td>Feb. 11</td>
<td>TEST 1 30%(2hr) [ Weeks 1,2,3,4] lecture (1hr)</td>
<td>Project 1 assigned</td>
</tr>
<tr>
<td>7</td>
<td>Feb. 18</td>
<td>--- READING WEEK ---</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Feb. 25</td>
<td>Loops, Randomization, Balancing</td>
<td>Project 2 assigned</td>
</tr>
<tr>
<td>9</td>
<td>Mar.  4</td>
<td>Data Analyses with Numpy, PsychoPy</td>
<td>Project 1 due</td>
</tr>
<tr>
<td>10</td>
<td>Mar. 11</td>
<td>Psychophysical Curve Fitting</td>
<td>ER3</td>
</tr>
<tr>
<td>11</td>
<td>Mar. 18</td>
<td>Graphing and Presentation</td>
<td>Project 2 due ER3</td>
</tr>
<tr>
<td>12</td>
<td>Mar. 25</td>
<td>Adaptive Experiments</td>
<td>Project 3 assigned</td>
</tr>
<tr>
<td>13</td>
<td>Apr.  1</td>
<td>Visualization and item analysis</td>
<td></td>
</tr>
</tbody>
</table>

--- Final project due April 4, 10:00am ---

The projects will be assessed according to: 1) the commenting in the code, 2) successful implementation, 3) robustness, 4) efficiency. Test 1 will be a written test to demonstrate mastery of the computing issues as relevant to psychological measurement. The final project may involve 1) troubleshooting/modifying an existing program, 2) modification of audio or video content, and 3) some written components. Evidence of code-sharing or queries in newsgroups, BBS etc., to acquire code for the Projects will result in assessment as academic misconduct under rules set in http://www.trentu.ca/academicintegrity.

Order and coverage of the following resources will be established by the second class in response to number of students, interest, and method of delivery.

### Reading List:


**External Resources:**

ER1 http://visionscience.com/documents/strasburger/strasburger.html


ER4 http://computingforpsychologists.wordpress.com/

ER5 http://psy.swan.ac.uk/staff/freegard/Response%20Box%20Report.pdf

ER6 http://www.aivosto.com/vbtips/imageformats.html

ER7 http://www.jiscdigitalmedia.ac.uk/digitisation

ER8 http://www dspguide.com/pdfbook.htm

ER9 http://www.youtube.com/watch?v=VV6qhuQgsl

ER10 http://docs.gimp.org/2.8/en/

ER11 http://audacity.sourceforge.net

ER12 https://developers.google.com/speed/webp/

for up-to-date classroom locations see:
   https://scheduler.trentu.ca/AcademicTimetable/Peterborough/FallWinter/
   https://scheduler.trentu.ca/AcademicTimetable/Oshawa/FallWinter/
University Policies

ACADEMIC INTEGRITY:
Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from a 0 grade on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University’s Academic Integrity Policy. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent’s Academic Integrity website to learn more – www.trentu.ca/academicintegrity.

ACCESS TO INSTRUCTION:
It is Trent University’s intent to create an inclusive learning environment. If a student has a disability and/or health consideration and feels that he/she may need accommodations to succeed in this course, the student should contact the Disability Services Office as soon as possible – in Peterborough (Trent Disability Services, 100 College Drive, Suite 139, 705-893-4178) or in Oshawa (Student Accessibility Services Office Room 111, nancyhempel@trentu.ca, 905-435-5102, ext. 5024).

A. MIDTERMS & FINAL EXAMINATIONS
Midterm examinations for half courses within the Psychology Department are scheduled by the instructor of the course. Midterm examinations for full courses and final examination for all courses are scheduled by the Registrar’s Office. Students are strongly urged NOT to make any commitments (i.e., vacation, job related, or other travel plans) during either the term as a whole or the final examination period. Students are required to be available for all examinations during the periods for which they are scheduled (as published in course syllabi).

B. DEFERRAL OF MIDTERM / FINAL EXAMINATIONS and/or TERM WORK
Extensions of deadlines for completion of assignments or writing of midterms/final examinations may be granted to students on the basis of illness, accident, or other extreme and legitimate circumstances beyond their control. Consideration for deferrals will not normally be granted on the basis of vacation/travel plans or job-related obligations.

C. SUPPORTING DOCUMENTATION
Students should expect that supporting documentation will be required and must be submitted before a deferral is approved. For illness or accident, supporting documentation will take the form of: (1) the Trent University Medical Certificate from Health Services: (http://www.trentu.ca/healthservices/medical.html), or (2) a certificate or letter from the attending physician clearly indicating the start and end dates of the illness and the student’s inability to write an examination, complete assignments, and/or attend classes, as relevant to the particular request. For other circumstances, students should consult the individual Psychology faculty member about acceptable forms of documentation.

Notes
1. Academic Integrity:
For the purpose of interpreting and applying the University policy on academic dishonesty, the Department of Psychology has adopted the following:

   When a student submits a piece of written work in fulfillment of an assignment, he/she implicitly acknowledges the following: a) that she/he is the sole author of the work; b) that the wording and organization of the work, apart from acknowledged quotations, is her/his own; and c) that she/he has and will not submit this work, either as a whole or in part, to satisfy another course requirement. These basic assumptions will be reasonably interpreted. They do not preclude collaboration between students upon a single project, by prior arrangement with the instructor, for shared academic credit (either for written or oral presentation).

   For an elaboration of the Department’s policy on, and for specific examples of, plagiarism, students should consult p. 178 in the APA (2010) and the sections on academic honesty (pp. 6-8), and appropriate citing and referencing (pp. 135-137, 169) in Mitchell et at. (2010) on reserve in the library. Students who have doubts about what might be considered academic dishonesty are urged to consult the instructor of the course. Ignorance of the University or Department policy does not excuse academic dishonesty. Submissions that fail to meet one or more of these considerations will be subject to procedures laid down in the policy on academic dishonesty as stated in the University calendar.

2. It is the policy of the Department NOT to accept faxed assignments.

3. The same assignment cannot be submitted in more than one course without the prior written permission of all instructors concerned. The written approval must be attached to the work when it is submitted.


5. Please see the Trent University academic calendar for University Diary dates, Academic Information and Regulations, and University and departmental degree requirements.

6. Last date to withdraw without academic penalty March 7, 2014 for Winter half courses and Feb. 6, 2014 for FA/WI full year courses.

7. Students will be notified of the first test score (out of 30% of total course mark) and Project score (out of 10% of total course mark) by March 7, 2014.

8. Policy for Late Submission/Presentation: Unexcused tardy submissions are subject to a recorded score of 0 (zero).

It is the responsibility of each student to read and accept the due dates outlined on the syllabus.