**General Education Course Inclusion Proposal**

**SCIENTIFIC INQUIRY**

*This proposal form is intended for departments proposing a course for inclusion in the Northern Michigan University General Education Program. Courses in a component satisfy both the Critical Thinking and the component learning outcomes. Departments should complete this form and submit it electronically through the General Education SHARE site.*

**Course Name and Number: Introduction to Psychology (PY100) *(\*Note: We have a CUP proposal being submitted to change PY100L to PY100 – thus we are submitting this GEC proposal as PY100)***

**Home Department: Department of Psychology**

**Department Chair Name and Contact Information** (phone, email): **Adam Prus, x2941, aprus@nmu.edu**

**Expected frequency of Offering of the course** (e.g. every semester, every fall): **Offered every fall and winter semester**

**Official Course Status**: Has this course been approved by CUP and Senate? **YES (PY100L is approved, revision to PY100 is going through CUP)**

*Courses that have not yet been approved by CUP must be submitted to CUP prior to review by GEC. Note that GEC is able to review courses that are in the process of approval; however, inclusion in the General Education Program is dependent upon Senate and Academic Affairs approval of the course into the overall curriculum.*

**Overview of course** (please attach a current syllabus as well): *Please limit the overview to two pages (not including the syllabus)*

A. Overview of the course content

PY100 provides a broad introduction to the major fields in the psychological sciences. Topics presented include learning, memory, development, personality, consciousness, psychological disorders and treatments, and social psychology with an emphasis on underlying biological processes when possible. Emphases are placed on critical thinking and the scientific study of behavior. The course includes both a lecture component and a 2 hr laboratory component. The laboratory involves conducting basic experiments that apply the scentific method to evaluate important concepts and principles in psychology. Upon successful completion of the course, students will be able to:

1. Demonstrate basic knowledge of theoretical underpinnings of the major areas of psychology, including cognition (thought, memory, perception), learning, personality, social and environmental influences, development, and physiology of behavior.
2. Recognize scientific ways of pursuing questions in Psychology
3. Apply knowledge of Psychology by conducting experiments in laboratory sections of the course

B. Explain why this course satisfies the Component specified and significantly addresses both learning outcomes

**CRITICAL THINKING**

*Evidence:* For the “evidence” dimension of this learning outcome, students must be able to assess the quality of information that may be integrated into an argument.” Students must learn to identify the sources of information, gauge the source on its scientific merit, and employ concepts and models derived from psychological research to interpret the information gathered. Students will demonstrate the ability to discern appropriate peer-reviewed sources (e.g., articles from scientific journals) from inappropriate sources (e.g., statements from noncredible websites) and be able to evaluate multiple hypotheses, identify common obstacles to problem solving (e.g, illusory correlations and biases), and develop conclusions that are best supported by available data.

*Integrate:* For the “integrate” dimension of this learning outcome, students must be able to “integrate insight and/or reasoning with existing understanding to reach informed conclusions and/or understanding.” Students must be capable of identifying what they are being asked to believe about this information and what available evidence is being presented to support the claim. They must also ask if there is another way in which the evidence could be interpreted and what evidence would be necessary for an alternative interpretation. Given a scenario, the student will be able to generate alternative interpretations, multiple hypotheses, and ways to test them in experimental settings.

*Evaluate:* For the “evaluate” dimension of this learning outcome, students must be able to “evaluate information, ideas, and activities according to established principles & guidelines.” Students must be capable of drawing conclusions based on available scientific evidence and connect evidence to theories and models in the field of Psychology. Based on existing evidence, students will be able to identify the most reasonable conclusion from an array of possible conclusions.

**SCIENTIFIC INQUIRY**

*Research Question:* For the “research question” dimension of this learning outcome, students must be able to “develop a manageable and appropriate research question that is tied to testable hypotheses.” The field of psychology relies on empirical research. During laboratory activities, students must be able to create specific and testable research questions and hypotheses in different areas of the psychological sciences.

*Methodology/Data Collection:* For the “methodology/data collection” dimension of this learning outcome, students must be able to “select and/or develop appropriate scientific methodologies.” During laboratory activities, students will design strategies for carrying out scientific experiments, including developing appropriate experiment methods and data collection plans.

*Analysis, Results and Presentation:*  For the “analysis, results, & presentation” dimension of this learning outcome, students must demonstrate that “collected data [are] appropriately analyzed and presented.” During laboratory activities, students will employ data analysis methods for data collected from observations. Students must also be able to describe data and analysis results as well as construct various forms of data presentation (e.g., graphs, tables, diagrams) from analyzed data.

*Discussion/Conclusions:* For the “discussion/conclusion” dimension of this learning outcome, students must demonstrate that “conclusions are linked to evidence and are in the context of scientific limitations and implications.” During laboratory activities, after results have been analyzed, students will interpret results, identify limitations in the conduct of the experiment, and provide reasonable conclusions about the data.

C. Describe the target audience (level, student groups, etc.)

The target audience for PY100 consists of first-year undergraduate students. The course is not designed only for students majoring or minoring in Psychology.

D. Give information on other roles this course may serve (e.g. University Requirement, required for a major(s), etc.):

As noted earlier, a CUP proposal will be submitted for inclusion in the 17-18 bulletin to have PY100L changed to PY100; further, we are deleting PY100S and PY100G. Therefore, this GEC proposal refers to the proposed revision for PY100. PY100 is a prerequisite for nearly all undergraduate courses in Psychology, and is therefore required Psychology majors and minors. PY100 is also required for the Integrative Neuroscience Major. A number of other departments use a PY100 course in an “other required courses” category for their majors. These programs include:

Athletic Training Major
Entrepreneurship Major
Finance and Risk Management Major
Information Assurance/Cyber Defense Major
Information Systems Major
Management Major
Management of Health and Fitness Major
Marketing Major
Nursing Major
Ski Area Business Management Major
Speech, Language and Hearing Sciences Major

E. Provide any other information that may be relevant to the review of the course by GEC.

This course serves over 300 students each semester, but we offer multiple laboratory sections that are capped at 30 students. The lecture portion of the course generally provides 3 or 4 exams, which are used to evaluate Critical Thinking and Scientific Inquiry learning objectives. The laboratory portion of the course provides 12-14 laboratory activities, which are also used to evaluate Critical Thinking and Scientific Inquiry learning objectives.

In the required laboratory experience for this course, students develop hands on experience conducting and evaluating laboratory research. In small groups of 3-4 students, each will:

* Conduct experiments germane to pertinent content areas of psychology including physiological psychology, sensation/perception, learning, cognition, standardized testing, development and statistical analysis.
* Collect and record behavioral data, prepare graphical analyses, and compute and interpret descriptive and inferential statistics; interpret findings to provide written discussions and conclusions
* Utilize various research procedures including simple observation, collection of survey data, and within- and between-subject experimental comparisons

**PLAN FOR LEARNING OUTCOMES
CRITICAL THINKING**

*Attainment of the CRITICAL THINKING Learning Outcome is required for courses in this component. There are several dimensions to this learning outcome. Please complete the following Plan for Assessment with information regarding course assignments (type, frequency, importance) that will be used by the department to assess the attainment of students in each of the dimensions of the learning outcome. Type refers to the types of assignments used for assessment such as written work, presentations, etc. Frequency refers to the number of assignments included such as a single paper or multiple papers. Importance refers to the relative emphasis or weight of the assignment to the entire course. For each dimension, please specify the expected success rate for students completing the course that meet the proficiency level and explain your reasoning. Please refer to the Critical Thinking Rubric for more information on student performance/proficiency in this area. Note that courses are expected to meaningfully address all dimensions of the learning outcome.*

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| **DIMENSION** | **WHAT IS BEING ASSESSED** | **PLAN FOR ASSESSMENT**  |
| **Evidence** | Assesses quality of information that may be integrated into an argument | **Type:** Selected questions from course exams and laboratory activities will be used to evaluate the “evidence” dimension of this learning outcome. All lecture instructors will issue exams and laboratory instructors will give assignments with question items written to evaluate students’ ability to discriminate and identify the quality of the information (source, data usage, etc.). An example of a question used in a course exam before is:Alex is trying to decide whether he should buy a magnetic bracelet to help him concentrate and improve his memory. He saw an advertisement for one in a magazine for $29.99. To evaluate the evidence supporting the claims that the bracelet will “help his concentration and memory,” Alex should look for …a. personal testimonials that claim the bracelet worksb. a bracelet from a company whose advertisements contain a lot of scientific jargonc. empirical evidence from a peer-reviewed journal d. irrefutable or nonfalsifiable claimsAn example of a laboratory exercise that evaluates the evidence dimension is:Students are asked to explain, by providing evidence from collected data, how one procedure is more or less effective than another in a laboratory report. In one laboratory exercise, students train a “computerized rat” to perform a behavioral bar press task using trial-and-error versus shaping procedures. For this particular task, students must use the data collected as evidence for stating why one training method was more effective than the other.**Frequency:** The number of exams used for the course might range from 2-4 per semester depending on the instructor. Most laboratory activities have a laboratory report due each week. **Expected success:** Instructors will identify items from these exams and reports that address the “evidence” dimension for this learning outcome. We expect 70% of students to be rated as “proficient” on these items. |
| **Integrate** | Integrates insight and or reasoning with existing understanding to reach informed conclusions and/or understanding | **Type:** Selected questions from course exams and laboratory activities will be used to evaluate the “integrate” dimension of this learning outcome. All lecture instructors will select exam questions and laboratory instructors will give assignments that evaluate how well students use critical thinking to integrate and analyze evidence. An example of a question used in a course exam before is:Rebecca swears by a new herbal supplement that made her most recent cold completely disappear. She thinks that everybody should take the supplement when they start to feel sick. Since you are practicing being a critical thinker, you know that you must evaluate alternative explanations. Which of the following alternatives would be least credible?a. Rebecca’s outcome could be the result of the placebo effect.b. Rebecca has a long history of relying on supplements to feel better.c. Rebecca’s cold may have gone away just because of the passage of time.d. Rebecca may have started eating healthier and exercising.An example of a laboratory exercise that evaluates the integrate dimension is:Students are asked to describe how their computed reliability score on a mock intelligence test compares to established standards, including considering whether or not this test would be a suitable instrument for the assessment of intelligence. Prior to this assignments, students were taught that the best intelligence tests have reliability coefficients of about .95 or better.**Frequency:** The number of exams used for the course might range from 2-4 per semester depending on the instructor. Most laboratory activities have a laboratory report due each week. **Expected success:** Instructors will identify items from these exams and reports that address the “integrate” dimension for this learning outcome. We expect 70% of students to be rated as “proficient” on these items.  |
| **Evaluate** | Evaluates information, ideas, and activities according to established principles and guidelines | **Type:** Selected questions from course exams and laboratory activities will be used to evaluate the “evaluate” dimension of this learning outcome. All lecture instructors will select exam questions and laboratory instructors will give assignments that evaluate how well students evaluate the quality of information and develop reasonable conclusions from information. An example of a question used in a course exam before is:A positive correlation was found between the rate of obesity reported in a particular neighborhood and the number of outdoor billboards/signs advertising food and non-alcoholic beverages in that same neighborhood (Lesser, et al., 2013). From this finding, it would be most reasonable to conclude that …a. obesity causes an increase in food and beverage billboards/signsb. there is no relation between the billboards/signs and obesityc. neighborhoods with more billboards/signs have higher levels of obesityd. food and beverage billboards/signs cause obesityAn example of a laboratory exercise that evaluates the evidence dimension is:Students are asked to describe the strength of a correlation between a reliability coefficient for a mock intelligence test and current grade in their laboratory section for PY100. From this correlation, students are also asked how well they could predict one’s grade or intelligence score, based upon whether or not statistical significance for the correlation was found. Finally, students would be asked conclude how these findings correspond with hypotheses developed at the beginning of the laboratory activity.**Frequency:** The number of exams used for the course might range from 2-4 per semester depending on the instructor. Most laboratory activities have a laboratory report due each week. **Expected success:** Instructors will identify items from these exams and reports that address the “evaluate” dimension for this learning outcome. We expect 70% of students to be rated as “proficient” on these items. |

**PLAN FOR LEARNING OUTCOMES
SCIENTIFIC INQUIRY**

*Attainment of the SCIENTIFIC INQUIRY Learning Outcome is required for courses in this component. There are several dimensions to this learning outcome. Please complete the following Plan for Assessment with information regarding course assignments (type, frequency, importance) that will be used by the department to assess the attainment of students in each of the dimensions of the learning outcome. Type refers to the types of assignments used for assessment such as written work, presentations, etc. Frequency refers to the number of assignments included such as a single paper or multiple papers. Importance refers to the relative emphasis or weight of the assignment to the entire course. For each dimension, please specify the expected success rate for students completing the course that meet the proficiency level and explain your reasoning. Please refer to the Rubric for more information on student performance/proficiency in this learning outcome. Note that courses are expected to meaningfully address all dimensions of the learning outcome.*

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| **DIMENSION** | **WHAT IS BEING ASSESSED** | **PLAN FOR ASSESSMENT**  |
| **Research Question** | Develop a manageable and appropriate research question that is tied to testable hypotheses. | **Type:** Selected questions from course exams and laboratory activities will be used to evaluate the “research question” dimension of this learning outcome. All lecture instructors will select exam questions and laboratory instructors will give assignments that evaluate how well students can develop a manageable and appropriate research question that is tied to a testable hypothesis.An example of a question used in a course exam before is:Suppose you are interested in the effects of stress on exam performance. Which of the following would be the best example of an appropriate hypothesis?a. in comparing individuals, some will experience higher levels of stress hormones than othersb. some individuals will have lower exam scoresc. because younger people experience more stress than their parents, they will do worse on examsd. students with higher levels of stress hormones will have lower exam scoresAn example of a laboratory exercise that evaluates the research question dimension is:Students will develop a research question and a testable hypothesis (as part of a larger assignment), to extend upon the classic experimental findings of von Helmholtz examining the speed of nerve conduction. In this activity, students will read about the procedure and classic findings using the procedure. With this background information in mind, students will develop a plan to use a multi-subject procedure that assists in a reduction in measurement error.**Frequency:** The number of exams used for the course might range from 2-4 per semester depending on the instructor. Most laboratory activities have a laboratory report due each week; several of these laboratory activities require students to develop research questions and testable hypotheses. **Expected success:** Instructors will identify items from these exams and reports that address the “research question” dimension for this learning outcome. We expect 70% of students to be rated as “proficient” on these items.  |
| **Methodology/Data Collection** | Select and/or develop appropriate scientific methodologies  | **Type:** Selected questions from course exams and laboratory activities will be used to evaluate the “methodological/data collection” dimension of this learning outcome. All lecture instructors will select exam questions and laboratory instructors will give assignments that evaluate how well students can select and/or develop a manageable and appropriate scientific methodologies.An example of a question used in a course exam before is:A researcher has uncovered a very unusual and rare behavioral disorder. The most appropriate type of design for better understanding this phenomenon would bea. naturalistic observationb. a case studyc. a between-group experimentd. a correlational studyAn example of a laboratory exercise that evaluates the methodology/data collection dimension is:In a sample item given earlier (the “integrate” dimension of Critical Thinking), students must evaluate whether certain types of behavioral evaluations are reliable and valid measures of the construct being considered for a mock intelligence test. Intelligence is a widely used construct that is difficult to define and even more difficult to measure. Students are asked to develop an appropriate scientific methodology for something as complex as “intelligence,” including a plan for data collection. **Frequency:** The number of exams used for the course might range from 2-4 per semester depending on the instructor. Most laboratory activities have a laboratory report due each week; several of these laboratory activities require students to develop appropriate scientific methodologies. **Expected success:** Instructors will identify items from these exams and reports that address the “research question” dimension for this learning outcome. We expect 70% of students to be rated as “proficient” on these items. |
| **Analysis, Results and Presentation** | Collected data [are] appropriately analyzed and presented | **Type:** Selected questions from course exams and laboratory activities will be used to evaluate the “analysis, results and presentation” dimension of this learning outcome. Lecture instructors will select exam questions and laboratory instructors will give assignments that evaluate how well students can appropriately collect, record, analyze and present data. An example of a question used in a course exam before is:Todd hypothesizes that the students in school A are more intelligent than the students in school B. To test his hypothesis, Todd samples students from each school and administers an intelligence test to the two groups. He finds there is a statistically significant difference in the scores of the two groups, which means that thea. students in one school are definitely more intelligence than those in the otherb. difference between the groups is due to chancec. students in the two schools are of equal intelligenced. difference between the groups is probably not due to chanceAn example of a laboratory exercise that evaluates the methodology/data collection dimension is:Since a completed laboratory report is required for each and every laboratory experiment, students must be able to demonstrate in their lab reports that they can compute descriptive and inferential statistical analyses and create a graphical presentation of the data.**Frequency:** The number of exams used for the course might range from 2-4 per semester depending on the instructor. Most laboratory activities have a laboratory report due each week; each of these laboratory activities require students to develop collect, record, analyze and graphically present data. **Expected success:** Instructors will identify items from these exams and reports that address the “analysis, results and presentation” dimension for this learning outcome. We expect 70% of students to be rated as “proficient” on these items. |
| **Discussion/Conclusions** | Conclusions are linked to evidence and are in the context of scientific limitations and implications. | **Type:** Selected questions from course exams and laboratory activities will be used to evaluate the “discussion/conclusions” dimension of this learning outcome. Lecture instructors will select exam questions and laboratory instructors will give assignments that evaluate how well students can appropriately develop conclusions that are linked to evidence and are in the context of scientific limitations and implications. An example of a question used in a course exam before is:Mario tested the statistical relationship between violence and population density. He found a correlation coefficient of -0.75. What can you conclude?a. Population density and violence are not related.b. a higher population density causes more violence.c. a higher population density is associated with more violence.d. a higher population density is associated with less violence.An example of a laboratory exercise that evaluates the methodology/data collection dimension is:Students are asked to evaluate, through written dicussion, and draw conclusions from their findings as they might relate to their ability to drive at dusk versus during the middle of the day after recording and analyzing data from a laboratory experiment designed to measure the absolute visual recognition threshold of stimuli under two different lighting conditions.**Frequency:** The number of exams used for the course might range from 2-4 per semester depending on the instructor. Most laboratory activities have a laboratory report due each week; each of these laboratory activities require students to develop discussions and conclusions from recorded and analyzed data. **Expected success:** Instructors will identify items from these exams and reports that address the “discussion/conclusion” dimension for this learning outcome. We expect 70% of students to be rated as “proficient” on these items. |