Outcomes for Student Learning - Student Learning Outcomes (SLO)

- The levels of knowledge, skills, and attitudes that a student has attained at the end/as a result of a course, certificate or degree program.
- The essential and significant learning expected of students who complete a course of study.

Format for Writing Student Learning Outcomes

Students will: Verb essential learning.
For example, students will: Diagnose mechanical failures.

Verbs can be selected that represent increasingly complex levels of performance as represented in the Bloom’s cognitive and the psychomotor/skills taxonomies below.

New Bloom’s Taxonomy – Cognitive Levels

<table>
<thead>
<tr>
<th>REMEMBERING</th>
<th>UNDERSTANDING</th>
<th>APPLYING</th>
<th>ANALYZING</th>
<th>EVALUATING</th>
<th>CREATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cite</td>
<td>Associate</td>
<td>Apply</td>
<td>Analyze</td>
<td>Appraise</td>
<td>Arrange</td>
</tr>
<tr>
<td>Count</td>
<td>Classify</td>
<td>Calculate</td>
<td>Appraise</td>
<td>Assess</td>
<td>Assemble</td>
</tr>
<tr>
<td>Define</td>
<td>Compare</td>
<td>Classify</td>
<td>Calculate</td>
<td>Assess</td>
<td>Collect</td>
</tr>
<tr>
<td>Draw</td>
<td>Compute</td>
<td>Demonstrate</td>
<td>Compare</td>
<td>Choose</td>
<td>Compose</td>
</tr>
<tr>
<td>Identify</td>
<td>Contrast</td>
<td>Determine</td>
<td>Classify</td>
<td>Criticize</td>
<td>Construct</td>
</tr>
<tr>
<td>List</td>
<td>Differentiate</td>
<td>Dramatize</td>
<td>Compare</td>
<td>Determine</td>
<td>Create</td>
</tr>
<tr>
<td>Name</td>
<td>Discuss</td>
<td>Employ</td>
<td>Debate</td>
<td>Estimate</td>
<td>Design</td>
</tr>
<tr>
<td>Point</td>
<td>Distinguish</td>
<td>Examine</td>
<td>Diagram</td>
<td>Evaluate</td>
<td>Formulate</td>
</tr>
<tr>
<td>Quote</td>
<td>Estimate</td>
<td>Illustrate</td>
<td>Differentiate</td>
<td>Grade</td>
<td>Integrate</td>
</tr>
<tr>
<td>Read</td>
<td>Explain</td>
<td>Interpret</td>
<td>Distinguish</td>
<td>Judge</td>
<td>Manage</td>
</tr>
<tr>
<td>Recite</td>
<td>Express</td>
<td>Locate</td>
<td>Examine</td>
<td>Measure</td>
<td>Organize</td>
</tr>
<tr>
<td>Record</td>
<td>Extrapolate</td>
<td>Operate</td>
<td>Experiment</td>
<td>Rank</td>
<td>Plan</td>
</tr>
<tr>
<td>Repeat</td>
<td>Interpolate</td>
<td>Order</td>
<td>Inspect</td>
<td>Rate</td>
<td>Prepare</td>
</tr>
<tr>
<td>Select</td>
<td>Locate</td>
<td>Practice</td>
<td>Inventory</td>
<td>Recommend</td>
<td>Prescribe</td>
</tr>
<tr>
<td>State</td>
<td>Predict</td>
<td>Report</td>
<td>Question</td>
<td>Revise</td>
<td>Produce</td>
</tr>
<tr>
<td>Tabulate</td>
<td>Report</td>
<td>Restructure</td>
<td>Separate</td>
<td>Score</td>
<td>Propose</td>
</tr>
<tr>
<td>Tell</td>
<td>Restate</td>
<td>Schedule</td>
<td>Summarize</td>
<td>Select</td>
<td>Specify</td>
</tr>
<tr>
<td>Trace</td>
<td>Review</td>
<td>Sketch</td>
<td>Test</td>
<td>Standardize</td>
<td>Synthesize</td>
</tr>
<tr>
<td>Underline</td>
<td>Tell</td>
<td>Solve</td>
<td></td>
<td>Test</td>
<td>Write</td>
</tr>
<tr>
<td></td>
<td>Translate</td>
<td>Translate</td>
<td></td>
<td>Validate</td>
<td></td>
</tr>
</tbody>
</table>

For a more complete description of new Bloom’s taxonomy:
- [http://www4.uwsp.edu/education/lwilson/curric/newtaxonomy.htm](http://www4.uwsp.edu/education/lwilson/curric/newtaxonomy.htm)
- [http://www.celt.iastate.edu/teaching/RevisedBlooms1.html](http://www.celt.iastate.edu/teaching/RevisedBlooms1.html)
SLO Distinguishing Characteristics

- **Measurable** – the learning can be observed/measured/verified.
- **Meaningful** – describes the significant competencies/essential learning/key ideas.
- **Manageable** – limited to a reasonable number that will be assessed.
- **Readable** – written in plain language that students can understand.

Ask yourself:

- Do the outcomes address what every student will be able to do at the completion of the course.
  - Do the SLOs address the expected level of learning for the course? See Bloom’s Taxonomy; consider content level and/or desired proficiency.
  - Do the SLOs address multiple domains (cognitive, psychomotor, and affective) as appropriate?
- Do the outcomes address competency and essential learning rather than content coverage.
  - Are these the main ideas in an outline of the course?
  - Are the outcomes important overarching concepts rather than the small nuts and bolts presented in a lesson?
  - Are these outcomes that are meaningful/useful in the “real world” (and/or for subsequent courses in a program/certificate/degree)
  - Are there a manageable number (3-7)?
- Can the outcome be observed/measured/verified? What is the evidence that demonstrates the level and proficiency of the learning.
- Will students know what they are expected to do?
How would each SLO be assessed/graded?

Student Learning Outcomes (SLOs) are the single most important component of a course syllabus or program/certificate/degree because:

- Well-written SLOs describe what students will know and be able to do as a result of completing the course/program/certificate/degree.
- Well-written SLO’s therefore indicate how the instructor can assess & grade the student’s progress.
- Knowing how to assess learning is a precursor for designing instruction/teaching. Teaching involves preparing students to be successful on the assessment. (Learning is practice for the performance described in the SLO.)

<table>
<thead>
<tr>
<th>SLO Students will</th>
<th>ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthesize a specified product from a list of starting materials.</td>
<td>Student writes or orally describes the process, or performs the process.</td>
</tr>
<tr>
<td>Form reasoned and well-informed judgments on current issues involving the development of peace and the nonviolent resolution of conflict both within and between individuals and social groups.</td>
<td>Student writes an essay or gives an oral presentation.</td>
</tr>
<tr>
<td>Write a multi paragraph persuasive essay containing a thesis statement supported by details and evidence organized in unified, coherent, and adequately developed paragraphs.</td>
<td>Student writes an essay.</td>
</tr>
</tbody>
</table>

Some SLO Examples by Discipline/Subject

Ag/Horticulture students will
- Judge cut flower quality based on industry standards.
- Create a saleable corsage and boutonniere.
- Develop a one-year production plan for one of the following species: beef cattle, swine, goats, horses, poultry, dairy cattle.

Art History students will
- Identify significant works of art created during the XXXX period
- Describe these works, using terminology appropriate to the discipline of art history.
- Analyze the works, using relevant information to place them within an accurate cultural context.

Computer Science students will
- Produce tables, queries, reports and forms using a database management program.
- Create complete C++ programs using objects, classes, polymorphism, and inheritance.
- Debug Java programs using Java compiler with IDE and debugger.
- Implement programs using selection statements, repetition statements, arrays, records, and pointers.
Culinary students will
• Enter an inventory sheet into a computer spreadsheet.
• Convert recipes from small to large and large to small, both by hand and by calculator.
• Price out a recipe and a menu with 100% accuracy.

Mathematics students will
• Calculate descriptive statistics for a data set.
• Use tables, transformations, critical points, and other characteristics to graph functions, conic sections and parametric equations.
• Solve second order difference equations with constant coefficients.
• Use graphing technology to visualize various functions and their derivatives, and verify solutions to problems in differential calculus.
• Demonstrate the relationship between the derivative and integral.
• Apply the theory of infinite series to approximate functions of one variable.

Psychology students will
• Define behavior, normal and abnormal, utilizing psychological concepts and appropriate terminology.
• Explain the basic goals of psychology and the various scientific and applied methods to attain these goals.
• Describe how the interactions of cognitive, social-environmental, and biological factors affect behavior.
• Critically evaluate research findings and psychological theories.

Science students will
• Identify plant tissues and structures using a compound microscope.
• Explain the ecological dependence of all life on plants including food chains and nutrient cycles.
• Use appropriate instrumentation and computational tools to collect, analyze and interpret data.
• Explain simple harmonic motion, general behavior of waves and how they relate to sound production and propagation.

Speech students will
• Engage in interpersonal communication orally and in writing on topics about their personal lives and immediate environment. (Interpersonal mode)
• Interpret written and spoken language on topics about their personal lives and immediate environment. (Interpretive mode)
• Present information, concepts, and ideas to an audience of listeners or readers on topics about their personal lives and immediate environment. (Presentational mode)

Technical students will
• Produce assembly drawings conforming to current ANSI/ASME standards.
• Dimension assembly drawings according to current industrial standards.
• Calculate the cost of work they perform using flat-rate manuals and computerized service literature.
• Perform service tasks to professional standards of quality using accepted methods and tools. (Program level)
• Identify the components of the criminal justice system.
• Explain the difference between trial and appellate courts.