

## Appendix B

### **Examples Specific to IUPUI's Principles of Undergraduate Learning (PULs)**

Listed below are the official definitions and outcomes associated with IUPUI's Principles of Undergraduate Learning (PULs). Examples of student learning outcome statements are included below each PUL. These examples are intended to model effective SLO statements that are both measurable and demonstrative of student learning. Examples are intended to describe what students will know, be able to do, or be able to demonstrate upon graduation from an academic program. Possible related program areas and major fields are included in parentheses. Some examples were chosen from existing SLO statements from IUPUI academic schools and programs. Please note that *connecting SLOs to the PULs may be helpful, but it is not essential*.

#### **Core Communication and Quantitative Skills**

*The ability of students to express and interpret information, perform quantitative analysis, and use information resources and technology – the foundational skills necessary for all IUPUI students to succeed.*

**Outcomes:** Core communication and quantitative skills are demonstrated by the student's ability to:

1. Express ideas and facts to others effectively in a variety of formats, particularly written, oral, and visual formats;
2. Comprehend, interpret and analyze ideas and facts;
3. Communicate effectively in a range of settings;
4. Identify and propose solutions for problems using quantitative tools and reasoning;
5. Make effective use of information resources and technology.

#### **Examples of Student Learning Outcomes:**

- Students will demonstrate that they are effective communicators who can share accurate information. (Nursing)
- Students will demonstrate the ability to communicate effectively with a range of audiences. (Computer Graphics Technology).
- Students will prepare a written technical document and deliver an oral presentation relevant to physics. (Physics)
- Students will demonstrate effective speaking skills and writing skills. (Psychology)
- Students will identify, define, analyze, and solve specific computing problems by stating the requirements appropriate to its solution. (Computer Graphics Technology)
- Students communicate orally in their own language using the terminology and techniques accepted in the historiographical profession. (History)
- Students communicate effectively in written and spoken form with clients, colleagues and interdisciplinary health team members through the use of multiple expressive caring modes and through the use of advanced information and communication technologies. (Nursing)
- Majors will analyze and interpret statistical data as they support decision-making processes throughout an organization. (Business)
- Students demonstrate a conceptual and aesthetic awareness of the relationship between audience and artwork. (Art History)
- Given a problem situation students will use calculus to determine whether it is a rate of change problem or a total change problem; and use the appropriate method to accurately solve the problem. (Mathematics)
- Students will demonstrate and apply knowledge of mathematics, science, and engineering that includes:
  - Knowledge in chemistry and calculus-based physics in depth
  - Mathematics through multivariate calculus, differential equations, and linear algebra
  - Probability and statistics
  - Mechanical Engineering sciences: solid mechanics, fluid-thermal science, material science, dynamics. (Engineering and Technology)

## Critical Thinking

*The ability of students to engage in a process of disciplined thinking that informs beliefs and actions. A student who demonstrates critical thinking applies the process of disciplined thinking, remaining open-minded, reconsidering previous beliefs and actions, and adjusting his or her thinking, beliefs and actions based on new information.*

**Outcomes:** *The process of critical thinking begins with the ability of students to remember and understand, but it is truly realized when the student demonstrates the ability to:*

1. Apply;
2. Analyze;
3. Evaluate, and
4. Create knowledge, procedures, processes, or products to discern bias, challenge assumptions, identify consequences, arrive at reasoned conclusions, generate and explore new questions, solve challenging and complex problems, and make informed decisions.

### Examples:

- Students will demonstrate the critical thinking skills of retention, comprehension, application, analysis, synthesis, and evaluation. (Psychology )
- Students will be critical thinkers who demonstrate intellectual curiosity, rational inquiry, problem solving skills, and creativity in framing problems. ( Nursing)
- Students will explain and classify evidence. (Forensic and Investigative Sciences )
- Students will explain, evaluate, and identify characteristics of fingerprints. (Forensic and Investigative Sciences)
- Students can apply principles of scientific inquiry, differentiate a theory from a hypothesis, and differentiate fact from opinion in regard to biological sciences. (Biology)
- Students will read and analyze texts and other primary sources, both critically and empathically, while addressing questions of genre, content, perspective and purpose. Primary sources include visual and material sources like topographical evidence, paintings, coins, medals, cartoons, photographs and films. (History)
- Graduates will apply basic research methods in psychology, including research design, data analysis, and interpretation (Psychology).
- Students will analyze current research findings in the areas of physiological psychology, perception, learning, abnormal, and social psychology. (Psychology)

## Integration and Application of Knowledge

*The ability of students to use information and concepts from studies in multiple disciplines in their intellectual, professional, and community lives.*

**Outcomes:** *Integration and application of knowledge are demonstrated by the student's ability to:*

1. Enhance their personal lives;
2. Meet professional standards and competencies;
3. Further the goals of society; and
4. Work across traditional course and disciplinary boundaries.

### Examples:

- Students will demonstrate the ability to apply their skills to other areas or problems. (Physics )
- Students will demonstrate the ability to conduct accurate, comprehensive and focused scientific investigations and apply appropriate rules of evidence. (Forensic and Investigative Sciences)
- Students will generate applications of psychology to individual, social, and organizational issues. (Psychology)
- Students will apply knowledge of forensic science to case scenarios. (Forensic and Investigative Sciences)
- Students will assess and describe aspects of sustainability, including economic, societal and environmental factors, especially in relation to biological systems. (Biology)
- Students will use an appropriate analytic frame to predict the impact of policy proposals on social welfare. (Economics)
- Students will identify and define the social, political, and economic institutions that influence modern society. (History)

### **Intellectual Depth, Breadth, and Adaptiveness**

*The ability of students to examine and organize disciplinary ways of knowing and to apply them to specific issues and problems.*

**Outcomes:** Intellectual depth, breadth, and adaptiveness are demonstrated by the student's ability to:

1. Show substantial knowledge and understanding of at least one field of study;
2. Compare and contrast approaches to knowledge in different disciplines;
3. Modify one's approach to an issue or problem based on the contexts and requirements of particular situations.

#### **Examples:**

- Students will demonstrate that they can apply the major concepts, theoretical perspectives, empirical findings and historical trends in psychology. (Psychology).
- Students will design, implement, and evaluate computer-based systems, processes, components, or programs to meet desired needs (Computer Graphics Technology).
- Students will apply principles of forensic science in crime scene investigation. (Forensic and Investigative Sciences)
- Students will compare and contrast the meaning of major texts from both the Western and non-Western cultures.(English)
- Students will apply the humanistic perspective to values, experiences, and meanings in their own lives. (English)
- Graduates will use a variety of performance-based assessment tools and techniques to inform instruction. (Education)
- Students will apply a body of anthropological theory to the analysis of a linguistic, cultural, or archeological phenomenon. (Anthropology)
- Students will describe how the techniques and methods of processing images are used on photographic evidence obtained at a crime scene. (Forensic and Investigative Sciences)

### **Understanding Society and Culture**

*The ability of students to recognize their own cultural traditions and to understand and appreciate the diversity of the human experience.*

**Outcomes:** Understanding society and culture is demonstrated by the students' ability to

1. Compare and contrast the range of diversity and universality in human history, societies, and ways of life;
2. Analyze and understand the interconnectedness of global and local communities; and
3. Operate with civility in a complex world.

#### **Examples:**

- Students will demonstrate that they are culturally competent persons who provide holistic nursing care to a variety of individuals, families, and communities. (Nursing)
- Students will explain diverse opinions in regard to professional, ethical, legal, and social issues in a global perspective. (Computer Graphics Technology)
- Students will demonstrate an ability to analyze and explain the impact of computing on individuals, organizations, and societies in both domestic and international environments. (Computer Graphics Technology)
- Students demonstrate the impact of engineering solutions in a global and societal context. (Engineering and Technology)
- Students utilize leadership skills to critically examine and advocate for the improved health care of clients. (Nursing)
- Students approach problems and issues from multi-ethnic, multi-racial, multi-cultural, and multi-religious points of view. (University College First-Year Seminars)
- Students deal effectively with conflicts among co-workers and friends. (Student Life and Co-curricular Experiences)
- Students describe the relationships among local, national, and global issues. (Student Life and Co-curricular Experiences)

## Values and Ethics

*The ability of students to make sound decisions with respect to individual conduct, citizenship, and aesthetics.*

**Outcomes:** *A sense of values and ethics is demonstrated by the student's ability to*

- 1. Make informed and principled choices and to foresee consequences of these choices;*
- 2. Explore, understand, and cultivate an appreciation for beauty and art;*
- 3. Understand ethical principles within diverse cultural, social, environmental, and personal settings.*

### Examples:

- Students will describe how ethics are applied to the presentation of expert testimony in court. (Forensic and Investigative Sciences)
- Students will develop self-awareness by identifying their own personal strengths, weaknesses, values, goals. (Psychology)
- Students will demonstrate an understanding of professional, ethical, legal, security and social issues and responsibilities. (Computer Graphics Technology)
- Students will explain why there is a constant need to engage in continuing professional development. (Computer Graphics Technology)
- Students will describe the major features of the Code of Ethics of the American Academy of Forensic Sciences and of other major forensic science organizations. (Forensics and Investigative Sciences)
- Psychology graduates will weigh evidence, tolerate ambiguity, act ethically, and reflect other values that are the underpinnings of psychology as a discipline. (Psychology)
- Students will describe the five fundamental values that this academic community expects: honesty, fairness, respect, responsibility and trust. (University College First-Year Seminars)
- Students assume responsibility and accountability for personal and professional behavior, ethical practice, and client advocacy, especially for vulnerable clients. (Nursing)