



## **Key Performance Indicators (KPI) of the Student Outcomes Metallurgical Engineering**

### **Student Outcome 1**

**An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.**

The Key Performance Indicators of the Student Outcome 1 are:

- 1.1 Identify the components of a complex problem and relevant mechanisms.
- 1.2 Formulate and express complex problems within the field of metallurgical engineering using mathematical or computational tools.
- 1.3 Solve or identify solutions for complex problems applying tools of engineering.

### **Student Outcome 2**

**An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.**

The Key Performance Indicators of the Student Outcome 2 are:

- 2.1 Conceive, design, implement and/or operate industrial processes relevant to metallurgical engineering, to create products and solutions by combining the tools of science and technology.
- 2.2 Evaluate investment and operation costs in projects associated within the extractive metallurgical industry.
- 2.3 Evaluate operational risks associated within the extractive metallurgical industry.
- 2.4 Apply criteria for safe design and operation, considering aspects of safety, health and the environment.

### **Student Outcome 3**

**An ability to communicate effectively with a range of audiences.**

The Key Performance Indicators of the Student Outcome 3 are:

- 3.1 Communicate effectively through writing abilities.
- 3.2 Communicate effectively through speaking abilities.
- 3.3 Communicate effectively through graphic or drawing abilities.
- 3.4 Communicate effectively to a wide range of audiences.

#### **Student Outcome 4**

**An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.**

The Key Performance Indicators of the Student Outcome 4 are:

- 4.1 Understand the economic impacts of decisions associated with the engineering practice.
- 4.2 Understand the environmental impacts of engineering practice.
- 4.3 Understand ethical implications and social responsibility of engineering practice.

#### **Student Outcome 5**

**An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.**

The Key Performance Indicators of the Student Outcome 5 are:

- 5.1 Demonstrate capacity for teamwork and leadership.
- 5.2 Function in a team characterized by a collaborative and inclusive environment.
- 5.3 Formulate and execute a work plan with objectives and goals.

#### **Student Outcome 6**

**An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.**

The Key Performance Indicators of the Student Outcome 6 are:

- 6.1 Conduct research on the state of the art of the disciplines associated with metallurgical engineering.
- 6.2 Formulate work goals.
- 6.3 Design and conduct experiments.
- 6.4 Analyze and interpret results.

### **Student Outcome 7**

**An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.**

The Key Performance Indicators of the Student Outcome 7 are:

- 7.1 Select scientific and technological information.
- 7.2 Identify emerging topics relevant to metallurgical engineering.
- 7.3 Apply critical thinking, creative ability, and scientific and technological curiosity.
- 7.4 Update and improve engineering skills.

### **Student Outcome 8**

**An ability to manage human, material, and financial resources.**

The Key Performance Indicators of the Student Outcome 8 are:

- 8.1 Manage financial resources.
- 8.2 Manage human resources.
- 8.3 Manage material resources.