



# Key Performance Indicators of the Student Outcomes

## Student Outcome 1

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability to identify, formulate and solve engineering complex problems applying math and science.	An ability to solve complex problems, within the field of chemical engineering, by applying the tools of math, science and principles of engineering.

The Key Performance Indicators of the Student Outcome 1 are:

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

## Student Outcome 2

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability to apply engineering design to produce solutions considering public health, safety and welfare, and global, cultural, social, environmental and economic factors.	Ability to conceive, design, install and operate industrial processes relevant to chemical engineering and similar disciplines, to create products and solutions by combining the tools of science and technology, as well as economic and environmental evaluation of physical, chemical and biological transformations of matter, while at the same time considering techno-economic, social and environmental criteria.

The Key Performance Indicators of the Student Outcome 2 are:

- 2.1 Conceive, design, install and/or operate industrial processes relevant to chemical engineering and similar disciplines, to create products and solutions by combining the tools of science and technology

- 2.2 Evaluate investment and operation costs in projects associated with the chemical process industry
- 2.3 Evaluate operational risks associated with the chemical process industry
- 2.4 Apply criteria for safe design and operation, considering aspects of safety, health and the environment
- 2.5 Understand the social implications of chemical processes industry

## Student Outcome 3

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability to communicate effectively with a range of audiences	Ability to communicate effectively in the professional field with a wide 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

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability to recognize and judge ethical and professional responsibilities considering impact of economic, environmental and societal contexts.	Ability to understand ethical and social responsibility in the context of professional practice, including economic and environmental impact of engineering in the global society.

The Key Performance Indicators of the Student Outcome 4 are:

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

## Student Outcome 5

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability for teamwork providing leadership, collaborative and inclusive environment with goals, plan tasks and objectives.	Ability to function in a team characterized by a collaborative and inclusive environment that formulates and executes a work plan with objectives and goals.

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

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability to develop and conduct appropriate experimentation, data analysis and interpretation and use engineering judgement to draw conclusions	Ability to carry out research and detailed studies of technical aspects of the profession by designing and conducting experiments while analyzing and interpreting their results

The Key Performance Indicators of the Student Outcome 6 are:

- 6.1 Carry out research about the state of the art of disciplines associated with chemical engineering.
- 6.2 Formulate working objectives.
- 6.3 Design and conduct experiments.
- 6.4 Analyze and interpret results.

## Student Outcome 7

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability to acquire and apply new knowledge using appropriate learning strategies	Ability to acquire and apply new knowledge and thus engage in continuous learning to update and improve professional skills in engineering

The Key Performance Indicators of the Student Outcome 7 are:

- 7.1 Select scientific and technological information
- 7.2 Identify emerging issues relevant to chemical engineering
- 7.3 Apply critical thinking, creative capacity and scientific technological curiosity
- 7.4 Update and improve engineering skills

## Student Outcome 8

<b>ABET Student Outcome</b>	<b>Chemical Engineering Student Outcome at the University of Concepción</b>
An ability for teamwork providing leadership, collaborative and inclusive environment with goals, plan tasks and objectives.	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.