



STUDENT OUTCOMES

SYSTEMS ENGINEERING PROGRAM

(1) Engineering Design

Definition	Design information systems satisfying requirements and needs as well as given technical, economic, social and legal constraints.
Criteria	Interpret requirements and needs and translate them into the formulation of a systems engineering project.
	Formulate the specifications of a design project considering technical variables, realistic economic and social restrictions, as well as the own characteristics of the course of the business.
	Propose and evaluate different architectures and solution alternatives to select the most adequate satisfying requirements and constraints.
	Develop the elements of an information system and integrate them applying proper methodologies according to project characteristics.
	Present and describe the solution through specifications, planes, engineering drawings, diagrams and virtual simulations.
	Develop, configure and integrate technology and communication technologies.



(2) Problem Solving

Definition	Identify, formulate and solve engineering problems properly using the methods, techniques and tools of systems engineering.
Criteria	Identify and diagnose problems and prioritize them according to their impact and relevance.
	Propose adequate and realizable solutions applying engineering criteria and systemic approach taking into account the own characteristics of the application domain.
	Model and simulate systems and processes for evaluating and optimizing their behavior and predict outcomes.
	Implement and maintain information systems satisfying requirements.
	Formulate algorithms, define structures for data processing and develop computer programs using proper methods and techniques.
	Operate and use equipment, instruments and software required for systems engineering practice.

(3) Sciences Application

Definition	Apply the knowledge and skills of mathematics, sciences and engineering to solve systems engineering problems.
Criteria	Identify the relevant variables of a system, define their metrics and formulates dependence relationships.
	Apply mathematical tools for modeling, simulating and analyzing the behavior of diverse complexity systems, as well as the process of an organization.
	Apply knowledge of mathematics for developing algorithms and information systems efficient in terms of execution times and resources demand.
	Interpret physical phenomena from the fundamental laws that govern them.



(4) Experimentation

Definition	Conceive and conduct experiments and tests, analyze data and interpret results.
Criteria	Determine the tests and experiments to be done, as well as the necessary infrastructure according to the required quality standards.
	Identify and relate the relevant parameters and variables of a system and properly estimate or measure them.
	Compile relevant information of similar tests and experiments.
	Analyze and process data and results using proper statistical methods and criteria.

(5) Modern Engineering Practice

Definition	Use and apply techniques, methods and tools of modern engineering necessary for the practice of systems engineering.
Criteria	Use modern and specialized software typical of professional practice.
	Apply modern techniques and methods for the analysis, design and implementation of information systems.
	Apply norms and standards to develop systems engineering projects.
	Use last generation information and communication technologies.

(6) Engineering Impact

Definition	Understand the impact of engineering solutions on people and society in local and global contexts.
Criteria	Understand the application of systems engineering in processes optimization and the efficient use of an organization resources.
	Appraise the economical and social benefits of systems engineering works on the progress of society and the wellbeing of people.
	Recognize the importance of systems engineering for the creation and innovation of products, processes and services.
	Understand the impact of systems engineering solutions in labor and social environments.



(7) Project Management

Definition	Plan and manage systems engineering projects taking into account quality, efficiency and productivity criteria.
Criteria	Formulate the objectives and restrictions of a systems engineering project and propose strategies for implementation.
	Determine the technical, economic and legal feasibility of a systems engineering project as well as its viability in the organization.
	Determine the scope of a project, its activities and priorities, and propose execution and control schedules.
	Identify the functional areas of an organization, relate them, and systematize its information processing systems.
	Manage the resources and activities of a systems engineering project considering aspects of quality, productivity, effectiveness and safety.

(8) Environmental Appraisal

Definition	Takes into account the importance of preserving and improving the environment in the development of their personal and professional activities.
Criteria	Promote the use of materials, technologies and processes that are environmentally adequate.
	Make a rational use of natural resources understanding their importance in the life of people and society.
	Participates in activities and campaigns for environment and ecosystems conservation and improvement.



(9) Lifelong Learning

Definition	Recognize the need to keep their knowledge and skills up to date according to advances of systems engineering and engage in lifelong learning.
Criteria	Identify relevant areas for the development of their professional career.
	Keep themselves up to date on new tendencies and technologies of systems engineering as well as their diverse applications.
	Be autonomous in their learning process.
	Be part of research groups and students branches of professional associations.
	Attend and participate in events of professional development.

(10) Contemporary Issues

Definition	Know and analyze relevant contemporary issues in local, national and global contexts.
Criteria	Be informed and emit opinion about the main social, economical and political facts in local and global contexts.
	Understand relevant social and economical issues affecting his/her professional career and working environment.

(11) Ethical and Professional Responsibility

Definition	Evaluate their decisions and actions from a moral perspective and assume responsibility for the executed projects.
Criteria	Anticipate the implications of their decisions as well as the results of their actions and projects
	Appraise the punctual and responsible fulfilling of their personal and professional duties.
	Respect the intellectual property and acknowledge the contribution of others.
	Takes into consideration community interests and the social benefit.
	Knows and act according to the professional code of ethics.



(12) Communication

Definition	Communicate clearly and effectively in oral, written and graphical formats, interacting with different types of audiences.
Criteria	Express their ideas clearly and concisely using the adequate technological support.
	Elaborate clear and precise technical documentation using norms, symbology and terminology proper of systems engineering.
	Adjust their speech according to the type of audience for getting a proper understanding and interpretation.
	Read technical documentation in English.

(13) Teamworking

Definition	Effectively participate and integrate in multi-disciplinary teams aiming to the achievement of goals and objectives.
Criteria	Appraise the importance of teamworking and promote the formation of work teams.
	Can perform as leader or active member of a working team effectively participating to achieve the proposed goals and results.
	Propose and accepts ideas conducting to the achievement of objectives and results.
	Appraise the differences of opinion, is tolerant and respect agreements.