

## COMPUTER SCIENCE CAREER

### Graduate Profile

The Graduate profile will enable the development of the capacities and attitudes of future professionals to consolidate their values regarding bioscience, responsible participation, honesty, and others.

<b>Profile</b>	<b>Learning outcomes</b>
<p>1. <i>Works cooperatively within the framework of respect for diversity.</i></p> <p>1. <i>Proceeds under ethical principles, defends rights and promotes the exercise of free citizenship.</i></p>	<p>1.1 Values the point of view of others.</p> <p>1.2 Expresses ideas and points of view for the achievement of learning.</p> <p>1.3 Promotes agreements with a positive, respectful attitude and a critical perspective.</p> <p>1.4 Assumes responsibilities within the group.</p> <p>2.1 Supports the axiological dimension of the human being.</p> <p>2.2 Reflects the presence of values in its performance.</p> <p>2.3 Knows about fundamental human rights.</p> <p>2.4 Identifies the regulatory framework and the institutions and procedures that ensure rights.</p> <p>2.5 Exercises and demands the exercising of rights.</p> <p>2.6 Responsibly assumes the obligations generated by the rights.</p> <p>2.7 Respects the freedom of others.</p> <p>2.8 Identifies the structural conditions that restrict freedom.</p> <p>2.9 Reports any situation that threatens human dignity.</p> <p>2.10 Rejects all types of imposition, authoritarianism, discrimination and exploitation.</p> <p>2.11 Promotes democratic coexistence and the active participation of citizens.</p> <p>2.12 Values the need for a just, supportive and equitable society (Good living).</p> <p>2.13 Becomes involved in social commitment initiatives.</p> <p>2.14 Interprets the meaning of being an "honest citizen" according to the principles of the Salesian Polytechnic University.</p>
<p>2. <i>Find the meaning of human existence in the transcendent dimension and options for the marginalized.</i></p>	<p>3.1 Argues faith, beliefs, principles and spiritual values.</p> <p>3.2 Respects the spiritual and religious manifestations of others.</p> <p>3.3 Evidences spiritual and religious values through university actions</p> <p>3.4 Values personal life project.</p> <p>3.5 Collaborates with projects for the impoverished.</p> <p>3.6 Analyzes economic, social and cultural inequalities at the local and national level.</p> <p>3.7 Identify possible solutions to situations of economic inequality</p>
<p>4. <i>Values the interrelation between</i></p>	<p>4.1 Identifies the evolution of CTS.</p>

<b>Profile</b>	<b>Learning outcomes</b>
<p><i>science technology and society (STS).</i></p> <p>5. Views humans as integral beings and contributes to the strengthening of an intercultural and inclusive society for good living.</p> <p>6. Act with social and environmental responsibility.</p>	<p>4.2 Explains main problems generated by the use of science and technology in society.</p> <p>4.3 Proposes alternative solutions to the problems in the CTS field.</p> <p>4.4 Assumes an ethical stance in the face of CTS interrelationships.</p> <p>4.5 Understands science and technology as a tool at the service of a just, equitable and harmonious society.</p> <p>5.1 Examines the evolution of the cosmos.</p> <p>5.2 Explains the historicity of the human being.</p> <p>5.3 Identifies the human being as an integral being.</p> <p>5.4 Recognizes the multiethnic, intercultural and plurinational reality of today's society.</p> <p>5.5 Explains the concepts of culture, multiculturalism and interculturality.</p> <p>5.6 Promotes intercultural dialogue.</p> <p>5.7 Exercises inclusive practices.</p> <p>6.1 Feels empathy for the impoverished: defends justice, the common good and solidarity.</p> <p>6.2 Constructor of citizenship: democratic, participatory, community, demands rights and observes duties; promotes a culture of peace.</p> <p>6.3 Ecological: seeks harmony between human beings, nature and the deity (s).</p> <p>6.4 Ethical: responsible for self actions in solidarity with fellow humans; actins are guided by principles and values.</p>

**Profile related to the domain of theories, conceptual systems, methods and languages of integration of knowledge, the profession and the research the future professional will develop.**

<b>Profile</b>	<b>Learning outcomes</b>
<p>1. Analyze, model and design innovative information systems according to customer needs, considering technical, operational and economic feasibility.</p>	<p>1.1. Determines the specification of software requirements.</p> <p>1.2. Designs software models at different levels of abstraction and data models at the transactional and analytical levels.</p> <p>1.3. Applies IT effort, schedule and cost management processes to ensure return on investment.</p> <p>1.4. Proposes technical, operational and economic feasibility studies for the development of information systems.</p> <p>1.5. Proposes the logical and physical architecture for an information system according to the client's needs and available resources.</p> <p>1.6. Selects artificial intelligence techniques that will be integrated into information systems to provide innovative functions for different user needs.</p> <p>1.7. Applies human-machine interaction techniques in the creation of computer solutions that are user-friendly.</p>

<b>Profile</b>	<b>Learning outcomes</b>
<p>2. Analyzes problems that arise in production processes and proposes alternative solutions based on Software Engineering, Numerical Analysis, Information Systems and Computational Methodologies, all within the framework of intercultural respect.</p> <p>3. Designs proposals for the creation, development and implementation of ICT projects based on available infrastructure and resources.</p>	<p>2.1. Applies business process modeling techniques.</p> <p>2.2. Determines the specification of software requirements.</p> <p>2.3. Designs software models at different levels of abstraction and data models at the transactional and analytical level.</p> <p>2.4. Applies process reengineering.</p> <p>2.5. Selects advanced techniques such as machine learning, pattern recognition, computer vision, prediction and decision support for the development of computer components that facilitate innovative solutions for complex problems and special user requirements.</p> <p>2.6. Values intercultural components involved in production processes.</p> <p>3.1. Establishes network device configurations.</p> <p>3.2. Creates network designs according to norms and standards.</p> <p>3.3. Establishes simulations of networking scenarios.</p>
<p>4. Manage IT projects under good practices in the planning, execution, control, monitoring and closing processes.</p>	<p>4.1. Applies methodologies and good management practices for technological projects.</p> <p>4.2. Analyzes the feasibility of projects that allow the return of IT investment.</p>
<p>5. Manages human talent as a fundamental part of the work team for the development of technological projects.</p>	<p>5.1. Understands human talent management processes.</p>
<p>6. Applies standards, models, methodologies, norms and / or good</p>	<p>6.1. Identify quality standards, models, methodologies and norms for software projects.</p>

<b>Profile</b>	<b>Learning outcomes</b>
<p><i>practices for software processes.</i></p> <p><i>7. Establishes Information Security Management Systems (ISMS) and computer audits in organizations that allow proposing solutions and contingency plans.</i></p>	<p>7.1. Designs information security risk analysis under standards.</p> <p>7.2. Formulates audit reports at the technical and managerial level.</p> <p>7.3. Analyzes security policies and controls in operating systems, computer networks and information systems; to establish adequate security levels for organizations.</p> <p>7.4. Analyzes risks and vulnerabilities to propose security plans.</p>

**Profile related to the cognitive abilities and generic competences necessary for future professional practice.**

<b>Profile</b>	<b>Learning outcomes</b>
<p><i>1. Uses academic and professional language orally and in writing.</i></p>	<p>1.1. Understands academic texts at their literal level.</p> <p>1.2. Interprets an academic text.</p> <p>1.3. Produces oral and written academic texts.</p> <p>1.4. Conducts a comprehensive reading of academic texts in a foreign language.</p>
<p><i>2. Reason logically and mathematically.</i></p>	<p>2.1. Identifies the structure of logical thinking</p> <p>2.2. Identifies fallacies in discourse.</p> <p>2.3. Develops coherent and logical speeches.</p> <p>2.4. Uses mathematical logic.</p> <p>2.5. Holds argumentative dialogues.</p>
<p><i>3. Use information and communication technologies</i></p>	<p>3.1. Applies computer tools for the development of their academic and professional activities.</p> <p>3.2. Uses communication networks to access information.</p> <p>3.3. Integrates academic and professional networks.</p>
<p><i>4. Manage innovative projects to transform reality within professional practice.</i></p>	<p>4.1. Identifies elements of an innovation project.</p> <p>4.2. Diagnoses needs of the environment.</p> <p>4.3. Ethically manages intervention proposals from the exercise of his profession.</p>
<p><i>5. Identify the various forms of knowledge production</i></p>	<p>5.1. Identifies the differences between a real object and a theoretical object as a production of science.</p> <p>5.2. Identifies science as a western cultural historical production.</p> <p>5.3. Develops proposals that enable intercultural dialogue of knowledge.</p> <p>5.4. Identifies the theoretical and political conditions generated by the crisis of the scientific paradigm.</p> <p>5.5. Identifies currents of critical thinking.</p> <p>5.6. Characterizes the method of critical thinking.</p>

<b>Profile</b>	<b>Learning outcomes</b>
<p><i>6. Develops research processes from a theoretical, empirical and methodological perspective</i></p>	<p>5.7. Identifies the fundamental categories to understand social complexity.</p> <p>5.8. Applies the methods of critical thinking and other knowledge depending on the circumstances.</p> <p>5.9. Shows openness to dialogue with other knowledge and disciplines.</p> <p>5.10. Contributes to the creation of environments and processes that favor a culture of criticality.</p> <p>5.11. Demonstrates capacity for self-criticism.</p> <p>5.12. Develops continuous and constant self-learning processes.</p> <p>6.1. Understands the plurality and epistemic complexity in the production of knowledge.</p> <p>6.2. Systematizes knowledge and information rigorously.</p> <p>6.3. Explains the process of production of scientific knowledge.</p> <p>6.4. Recognizes the plurality of research methods.</p> <p>6.5. Designs scientific research projects.</p> <p>6.6. Investigates with scientific and academic rigor.</p> <p>6.7. Writes research reports.</p>

**Profile related to the management of professional and investigative models, protocols, processes and procedures necessary for future professional performance.**

<b>Profile</b>	<b>Learning outcomes</b>
<p><i>1. Develops and evaluates computer components for ICT solutions and tools based on advanced techniques such as machine learning, pattern recognition, computer vision, prediction and support for decision-making, starting from an ethical base and seeking to apply a humanistic approach.</i></p>	<p>1.1. Select advanced techniques such as machine learning, pattern recognition, computer vision, prediction and decision support for the development of computer components to provide innovative solutions for complex problems and special user requirements.</p> <p>1.2. Considers the legislation that regulates ICTs, as well as codes of ethics.</p> <p>1.3. Identifies the physical phenomena that can be computationally simulated.</p>
<p><i>2. Participate in research projects / centers that evaluate and execute mathematical models that</i></p>	<p>2.1. Uses a quantitative research approach to the application of the scientific method.</p> <p>2.2. Uses academic narratives to present research results.</p> <p>2.3. Creates and evaluate variables operation matrices.</p> <p>2.4. Applies mathematical models through computational algorithms</p>

Profile	Learning outcomes
<p><i>optimize ICT solutions.</i></p> <p><i>3. Develops technological initiatives that implement innovative computational methods and techniques to improve technology disaggregation processes and support the construction of an infrastructure for systemic productivity</i></p> <p><i>4. Manage Database Management Systems.</i></p> <p><i>5. Analyze large volumes of data to support decision-making through estimates and studies related to the activities of organizations</i></p> <p><i>6. Develops, implements and manages Information Systems considering the Free Software philosophy, intercultural respect, socioeconomic and environmental impact.</i></p> <p><i>7. Designs and implements IT</i></p>	<p>3.1. Select advanced techniques such as machine learning, pattern recognition, computer vision, prediction and decision support for the development of computer components to provide innovative solutions for complex problems and special user requirements.</p> <p>3.2. Identifies the physical phenomena that can be computationally simulated.</p> <p>3.3. Identifies the operation of sensors, actuators and communication interfaces.</p> <p>3.4. Understand embedded systems architectures.</p> <p>3.5. Designs software models at different levels of abstraction and data models at the transactional and analytical level.</p> <p>4.1. Uses data definition and manipulation languages in different Database Management Systems.</p> <p>4.2. Determines configurations and prepare database servers.</p> <p>4.3. Establishes backup and recovery strategies.</p> <p>5.1. Uses descriptive and inferential statistics for data analysis.</p> <p>5.2. Proposes the design of a data warehouse.</p> <p>5.3. Uses clustering techniques for data analysis in decision making.</p> <p>5.4. Determines data mining techniques and their adaptability in organizations</p> <p>6.1. Determines the specification of software requirements.</p> <p>6.2. Designs software models at different levels of abstraction and data models at the transactional and analytical level.</p> <p>6.3. Applies IT effort, schedule and cost management processes to ensure return on investment.</p> <p>6.4. Proposes technical, operational and economic feasibility studies for the development of information systems.</p> <p>6.5. Proposes the logical and physical architecture for an information system according to client needs and available resources.</p> <p>6.6. Understands the philosophy of free software and its business model.</p> <p>6.7. Applies human-machine interaction techniques in the creation of user-friendly computer solutions.</p> <p>7.1. Evaluates the different network architectures.</p> <p>7.2. Establishes network device configurations.</p>

<b>Profile</b>	<b>Learning outcomes</b>
<p><i>solutions with adequate social and organizational impact.</i></p> <p><b>8. Administer and manage IT access services.</b></p>	<p>7.3. Creates network designs according to norms and standards.</p> <p>7.4. Establishes simulations of networking scenarios.</p> <p>8.1. Establishes network services configurations considering the administration and management.</p> <p>8.2. Analyzes the quality of network services based on monitoring.</p> <p>8.3. Applies network management standards.</p>