ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL

RESOLUCIÓN Nro. 21-07-230

El **Consejo Politécnico,** en sesión ordinaria efectuada el día 22 de julio de 2021, facultado legal, estatutaria y reglamentariamente adoptó la siguiente resolución:

Considerando:

Que, el artículo 355 de la Constitución de la República del Ecuador (CRE), determina en lo pertinente que "*El Estado reconocerá a las universidades y escuelas politécnicas autonomía académica, administrativa, financiera y orgánica, acorde con los objetivos del régimen de desarrollo y los principios establecidos en la Constitución (…) Se reconoce a las universidades y escuelas politécnicas el derecho a la autonomía, ejercida y comprendida de manera solidaria y responsable. Dicha autonomía garantiza el ejercicio de la libertad académica y el derecho a la búsqueda de la verdad, sin restricciones; el gobierno y gestión de sí mismas, en consonancia con los principios de alternancia, transparencia y los derechos políticos; y la producción de ciencia, tecnología, cultura y arte. (…)";*

Que, el artículo 17 de la Ley Orgánica de Educación Superior vigente, señala lo siguiente: *Reconocimiento de la autonomía responsable. - El Estado reconoce a las universidades y escuelas politécnicas autonomía académica, administrativa, financiera y orgánica, acorde con los principios establecidos en la Constitución de la República. (…);*

Que, el artículo 2 del Estatuto de la Escuela Superior Politécnica del Litoral (ESPOL): *"La Escuela Superior Politécnica del Litoral es una institución pública que se rige por los principios de autonomía responsable y calidad, cogobierno, igualdad de oportunidades, democracia, pertinencia, integralidad, autodeterminación para la producción del pensamiento y conocimiento en el marco del diálogo de saberes, pensamiento universal y producción científica y tecnológica global; además, como parte del Sistema de Inclusión y Equidad Social también se rige por los principios de universalidad, igualdad, equidad, progresividad, interculturalidad, solidaridad y no discriminación, consagrados en la Constitución de la República del Ecuador y en la Ley Orgánica de Educación Superior;*

Que, el texto de la recomendación Nro. C-Doc-2021-100, acordada en sesión de Comisión de Docencia el 15 de junio de 2021, aprobada por el Consejo Politécnico mediante resolución Nro. 21-06-208 en sesión del 24 de junio del mismo año, remitido por la Secretaría Técnica de Aseguramiento de la Calidad, (STAC), no corresponde con la última versión de los Resultados de Aprendizaje y Rúbricas institucionales; además, las rúbricas usadas por las carreras acreditadas por EAC y CAC de ABET;

Que, el artículo 23, letra k) del Estatuto vigente de la ESPOL señala que son atribuciones y responsabilidades del Consejo Politécnico las siguientes: "*(…) k) Conocer y decidir sobre las propuestas o sugerencias que presenten las comisiones asesoras o los comités (…)*";

Por lo expuesto, el Consejo Politécnico, en uso de sus obligaciones y atribuciones determinadas en el artículo 23, letra k) del estatuto de la ESPOL, facultado legal, estatutaria y reglamentariamente,

RESUELVE:

CONOCER y **APROBAR** la **Fe de Erratas** a la **Recomendación** de la **Comisión de Docencia** Nro. ***C-Doc-2021-100,*** acordada en sesión del martes 15 de junio de 2021, contenida en el anexo (18 f. ú.) del Oficio Nro. **ESPOL-C-DOC-2021-0063-O** del 19 de julio del año en curso, dirigido a Stephanie Quichimbo Córdova, Mg., Secretaria Administrativa de la Espol, suscrito por Freddy Veloz de la Torre, Msig., secretario de la mencionada Comisión; la recomendación debida y legalmente aprobada se encuentra detallada a continuación:

C-Doc-2021-100.- Resultados de Aprendizaje de las carreras de la ESPOL.

Considerando el oficio Nro. **ESPOL-STAC-OFC-0031-2021**, con fecha 11 de junio de 2021, suscrito por la M.Sc. Sofía Anabel López Iglesias, Directora de la Secretaría Técnica de Aseguramiento de la Calidad, STAC, donde solicita revisar los resultados de Aprendizaje de la ESPOL, la Comisión de Docencia acuerda:

APROBAR los Resultados de Aprendizaje en concordancia con lo expuesto por la Directora de la STAC, según detalle:

Resultados de Aprendizaje ESPOL

En el documento adjunto se encuentran los resultados de aprendizaje institucionales para las carreras de la Escuela Superior Politécnica del Litoral (ver Tabla 1). Así como, los resultados disciplinares para las carreras de ingeniería bajo la Comisión de Acreditación de Ingeniería de ABET (EAC: Engineering Accreditation Commission) (ver Tabla 2) y la Comisión de Acreditación de Computación de ABET (CAC: Computing Accreditation Commission) (ver Tabla 3). Las carreras de ingeniería en futuros procesos de acreditación pueden usar los resultados de aprendizaje de la Comisión de Acreditación de Ingeniería de ABET (EAC: Engineering Accreditation Commission).

Las carreras -distintas a las ingenierías- usarán los resultados de aprendizaje institucionales, realizando los ajustes pertinentes de acuerdo con las guías de sus acreditadoras; además de otros resultados -u otra denominación- en caso de ser pertinente para lograr acreditaciones internacionales.

Tabla 1: Evolución de los Resultados de Aprendizaje Institucionales (SO's: Student Outcomes)

SOs anteriores	SOs actualizados (en inglés)	SOs actualizados (en español)
SO_f: An understanding of professional and ethical responsibility.	4. An ability to recognize ethical and professional responsibilities in professional situations and make informed judgements, which must consider the impact of the solutions in global, economic, environmental, and societal contexts.	4. Habilidad para reconocer responsabilidades éticas y profesionales en situaciones profesionales y emitir juicios sustentados, que deben considerar el impacto de las soluciones en contextos globales, económicos, ambientales y sociales.
SO_g1 a: An ability to communicate effectively (orally)	3.a. An ability to communicate effectively with a range of audiences/diverse professional contexts in Spanish.	3.a. Habilidad de comunicarse de manera efectiva con un rango de audiencias/diversos contextos profesionales en español.
SO_g1 b: An ability to communicate effectively (written)		
SO_d: An ability to function on multidisciplinary teams.	5. An ability to function effectively on a team[1] whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	5. Habilidad para funcionar eficazmente en un equipo cuyos miembros juntos brindan liderazgo, crean un entorno colaborativo e inclusivo, establecen metas, planifican tareas y cumplen objetivos.
SO_i: A recognition of the need for, and an ability to engage in life-long learning.	7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	7. Habilidad para adquirir y aplicar nuevos conocimientos según sea necesario, utilizando estrategias de aprendizaje adecuadas.
SO_g2: An ability to communicate in English	3.b. An ability to communicate effectively with a range of audiences/diverse professional contexts in English.	3.b. Habilidad de comunicarse de manera efectiva con un rango de audiencias/diversos contextos profesionales en inglés.
SO_l: Reconocer la necesidad y tener la habilidad para emprender	8. To design real solutions with a unique value proposition to address specific needs considered from the point of view of stakeholders.	8. Diseñar soluciones reales con una propuesta de valor única para atender necesidades específicas consideradas desde el punto de vista de los grupos de interés.
SO_j: A knowledge of contemporary issues.	No se mide ni forma. Fusionado con SO_f.	

[1] **Team:** a team consists of more than one person working toward a common goal and should include individuals of diverse backgrounds, skills, or perspectives.

Student Outcomes (Resultados de Aprendizaje): Engineering Accreditation Commission (EAC) ABET

Tabla 2: Resultados de Aprendizaje institucionales y disciplinares de las carreras de Ingeniería de ESPOL, acreditadas por la Comisión de Ingeniería de ABET.

English	Spanish
1. An ability to identify, formulate, and solve complex engineering problems[2] by applying principles of engineering, science, and mathematics.	1. Habilidad para identificar, formular y resolver problemas complejos de ingeniería, mediante la aplicación de principios de ingeniería, ciencia y matemática.
2. An ability to apply engineering design[3] 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.	2. Habilidad para aplicar diseño ingenieril, para producir soluciones que satisfagan necesidades específicas; considerando la salud pública, seguridad y el bienestar; así como factores globales, culturales, sociales, ambientales y económicos.
3.a. An ability to communicate effectively with a range of audiences in Spanish.	3.a. Habilidad para comunicarse efectivamente en español con un rango de audiencias en español.
3.b. An ability to communicate effectively with a range of audiences in English.	3.b. Habilidad de comunicarse de manera efectiva con un rango de audiencias en inglés.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	4. Habilidad para reconocer responsabilidades éticas y profesionales en situaciones de ingeniería y emitir juicios sustentados, considerando el impacto de las soluciones de ingeniería en el contexto global, económico, ambiental y social.
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.	5. Habilidad para trabajar efectivamente en equipo, cuyos miembros en conjunto provean liderazgo, creen un entorno colaborativo e inclusivo, establezcan metas, planifiquen tareas y cumplan objetivos.

[2] **Complex Engineering Problem:** Complex engineering problems include one or more of the following characteristics: involving wide-ranging or conflicting technical issues, having no obvious solution, addressing problems not encompassed by current standards and codes, involving diverse groups of stakeholders, including many component parts or sub-problems, involving multiple disciplines, or having significant consequences in a range of contexts.

[3] **Engineering Design:** Engineering design is a process of devising a system, component, or process to meet desired needs and specifications within constraints. It is and iterative, creative, decision-making process in which the basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. Engineering design involves identifying opportunities, developing requirements, performing analysis and synthesis, generating multiple solutions, evaluating solutions against requirements, considering risks and making trade-offs, for the purpose of obtaining a high quality solution under the given circumstances. For illustrative purposes only, examples of possible constrains include accessibility, aesthetics, codes, consructability, cost, ergonomics, extensibility, functionality, interoperability, legal considerations, maintainability, manufacturability, marketability, policy, regulations, schedule, standards, sustainability, or usability.

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	6. Habilidad para desarrollar y conducir experimentación apropiada, analizar e interpretar datos y usar criterio ingenieril para establecer conclusiones.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	7. Habilidad para adquirir y aplicar nuevos conocimientos -según sean necesarios-, usando estrategias apropiadas de aprendizaje.
8. To design real solutions with a unique value proposition to address specific needs considered from the point of view of stakeholders.	8. Diseñar soluciones reales que proponen valor único como respuesta a necesidades específicas consideradas desde el punto de vista de los involucrados.

Student Outcomes (Resultados de Aprendizaje): Computer Accreditation Commission (CAC) ABET

Tabla 3: Resultados de Aprendizaje institucionales y disciplinares de la carrera de Ingeniería en Computación (acreditada por la Comisión de Computación).

English	Spanish
1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.	1.Analizar un problema computacional complejo y aplicar principios de computación y otras disciplinas relevantes para identificar soluciones.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	2. Diseñar, implementar y evaluar una solución basada en computación para cumplir con un conjunto dado de requisitos de computación en el contexto de la disciplina del programa.
3.a. Communicate effectively in a variety of professional contexts in Spanish.	3.a. Comunicarse efectivamente en una variedad de contextos profesionales en español.
3.b. Communicate effectively in a variety of professional contexts in English.	3.b. Comunicarse efectivamente en una variedad de contextos profesionales en inglés.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles	4. Reconocer las responsabilidades profesionales y realizar juicios en la práctica computacional basado en principios legales y éticos.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.	5. Funcionar efectivamente como miembro o líder de un equipo involucrado en actividades apropiadas para la disciplina del programa.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.	6. Habilidad para aplicar teoría de ciencias computacionales y fundamentos de desarrollo de software para producir soluciones basadas en computación.
7. An ability to lead, manage and undertake projects.	7. Habilidad para liderar, gestionar y emprender proyectos.

Rúbricas de los Resultados de Aprendizaje Institucionales: ESPOL

3.a. Habilidad para comunicarse efectivamente en español con un rango de audiencias/diversos contextos profesionales en español.

Criterio	Insatisfactorio	En Desarrollo	Satisfactorio	Ejemplar
COMUNICACIÓN VERBAL Organización de las ideas, léxico, ayuda visual, vocalización, entonación y manejo de las pausas.	El discurso carece de estructura. El léxico no es adecuado para la audiencia. La vocalización y entonación son deficientes. No se respetan las indicaciones con respecto a la ayuda visual, ni al tiempo asignado.	La estructura del discurso es mejorable. El léxico es parcialmente adecuado para la audiencia. La vocalización y entonación se pueden pulir. No se respetan todas las indicaciones con respecto a la ayuda visual, e incumple con el tiempo asignado.	El discurso tiene, en su mayor parte, una estructura correcta. El léxico es pertinente para la audiencia. La vocalización y entonación son bastante adecuadas en la mayor parte de la exposición. La ayuda visual es clara y agradable. Se respeta el tiempo asignado.	El discurso presenta una estructura clara. El léxico es formal/académico; adecuado para la audiencia. La vocalización y entonación son totalmente acertadas. La ayuda visual contribuye a enriquecer lo que se expone. Incluye ejemplos que ilustran el mensaje. Se respeta el tiempo asignado.
	No tiene control sobre el uso de las muletillas y/o pausas sonoras; emplea más de cuatro.	Uso máximo de cuatro muletillas y/o pausas sonoras.	Hay un buen manejo de las pausas. Usa, máximo, dos muletillas o pausas sonoras.	El manejo de las pausas contribuye a la comprensión del mensaje. No emplea muletillas ni pausas sonoras.
COMUNICACIÓN NO VERBAL Contacto visual, postura corporal, uso de manos, gesticulación, otros.	La postura del cuerpo, la expresión gestual y el contacto visual no apoyan al discurso oral. Se evidencia inseguridad y/o rigidez.	La postura del cuerpo, la gesticulación y el contacto visual apoyan parcialmente al discurso oral. Se evidencia algo de inseguridad y/o rigidez.	La postura del cuerpo, la gesticulación y el contacto visual brindan apoyo al discurso oral. Evidencia confianza, preparación y algo de entusiasmo.	La postura corporal, la gesticulación y el contacto visual expresan seguridad, entusiasmo y brindan apoyo al discurso oral. Hay un excelente dominio escénico.
COMUNICACIÓN ESCRITA Estructuración de las ideas; claridad y precisión. Uso de la normativa ortográfica.	El escrito carece de estructura y articulación. Las ideas son ambiguas. No presenta fuentes para sustentar las ideas, o si las incluye no son confiables. No cita adecuadamente, ni respeta el límite de palabras.	La organización lógica entre las ideas es mejorable. Ocasionalmente, las ideas se sustentan en fuentes confiables y/o pertinentes al tema. No cita adecuadamente, ni respeta el límite de palabras.	El escrito articula la mayor parte de las ideas de una manera efectiva, con lógica. En su mayoría, las fuentes son confiables y relacionadas al tema. Cita de forma correcta. Respeta el límite de palabras.	Las ideas se articulan, totalmente, de manera efectiva; el escrito tiene una estructura lógica y coherente. Se presentan fuentes confiables y relacionadas al tema, que sustentan el discurso. Cita de forma correcta. Respeta el límite de palabras.
	No aplica correctamente las reglas ortográficas; presenta más de cuatro errores. El	No siempre aplica correctamente las reglas ortográficas; presenta de uno a cuatro errores. El vocabulario, muy pocas	La aplicación de la normativa del lenguaje es correcta; puede presentar un error. En la mayor parte del escrito, el vocabulario es adecuado al	Hay dominio en la aplicación de la normativa del lenguaje. A lo largo de toda la redacción, se emplea un léxico formal, académico y

	vocabulario no es adecuado al contexto.	veces, es adecuado al contexto.	contexto.	adecuado al contexto. No hay errores ortográficos.

3.b. La habilidad de comunicarse de manera efectiva con un rango de audiencias/diversos contextos profesionales en inglés.

Criterio	Insatisfactorio	En Desarrollo	Satisfactorio	Ejemplar
1. Estructura de la presentación oral y escrita	Carece de organización lógica. Muestra cierta coherencia, pero las ideas carecen de coherencia. El vocabulario es limitado, informal y coloquial.	Alguna información presentada en secuencia lógica. Algunos puntos quedan desplazados y se desvían del tema. El vocabulario a veces es vago.	Es coherente y está organizado lógicamente. Transiciones utilizadas entre ideas y párrafos para crear coherencia. El vocabulario es claro.	Muestra un alto grado de atención a la lógica y al razonamiento de los puntos. Conduce claramente al lector / oyente a la conclusión y suscita pensamientos sobre el tema. El vocabulario es muy apropiado para el contexto. Es muy claro.
2. Presentación escrita / logro de la tarea	No es lógico Las ideas están presentes con detalles que pueden ser irrelevantes, inapropiados o inexactos. Errores continuos de ortografía, gramática, sintaxis y/o puntuación que dificultan la lectura.	Es lógico y sólido. Las ideas están presentes, pero podrían extenderse más completamente. Muestra un patrón de errores de ortografía, gramática, sintaxis y / o puntuación.	Está bien presentado. Las ideas se detallan, desarrollan y respaldan. Tiene pocos errores de ortografía, gramática, sintaxis y puntuación.	Está excepcionalmente bien presentado y argumentado. Las ideas están detalladas, bien desarrolladas y respaldadas con pruebas y hechos específicos. Está libre de errores ortográficos, gramaticales, de sintaxis y de puntuación que distraigan la atención.
3. Fluidez y pronunciación de presentaciones orales	El habla es lenta, vacilante y tensa excepto por frases cortas memorizadas; inaudible. Más de tres palabras mal pronunciadas	El habla es relativamente suave con algunas vacilaciones e irregularidades. El volumen oscila. No más de dos palabras mal pronunciadas.	Habla fluida; pocas vacilaciones; una ligera búsqueda de palabras. Palabras inaudibles o dos. No más de una palabra mal pronunciada.	Habla fluida; pocas o ninguna vacilación; sin intentos de buscar palabras. El volumen es excelente. Sin palabras mal pronunciadas.

4. Habilidad para reconocer responsabilidades éticas y profesionales en situaciones profesionales y emitir juicios sustentados, considerando el impacto de las soluciones en el contexto global, económico, ambiental y social.

Criterio	Insatisfactorio	En Desarrollo	Satisfactorio	Ejemplar
Reconoce los dilemas éticos, las partes interesadas y sus consecuencias.	El estudiante es incapaz de reconocer un problema ético en una situación personal o social particular.	El alumno es capaz de reconocer el problema ético y lo aborda de forma adecuada pero incompleta, es decir, sin poder identificar a los implicados ni a las consecuencias.	El alumno es capaz de reconocer el problema ético, incluidas las partes interesadas directas e indirectas y sus consecuencias.	El alumno es capaz de reconocer el problema ético identificando las partes interesadas directas e indirectas y sus consecuencias. Además, es capaz de identificar entre las partes interesadas quienes deben tomar un cargo o una decisión.
Identificar los problemas que tienen un impacto en la sociedad.	El alumno no identifica ningún factor	El estudiante identifica factores que no son relevantes	El estudiante identifica factores críticos para el sistema considerando temas contemporáneos.	El estudiante identifica y hace un juicio basado en esos problemas contemporáneos.
Seleccionar alternativas de solución para resolver los problemas de la sociedad considerando contextos globales, económicos, ambientales y sociales	No genera alternativas	Genera alternativas, pero no discrimina la alternativa adecuada.	Genera alternativas y prioriza sin considerar el impacto de todo el contexto relevante.	Genera alternativas y discrimina las adecuadas, considerando el impacto en contextos globales, económicos, ambientales y sociales.

5. Habilidad para trabajar efectivamente en equipo, cuyos miembros en conjunto provean liderazgo, creen un entorno colaborativo e inclusivo, establezcan metas, planifiquen tareas y cumplan objetivos.

Criterio	Insatisfactorio	En Desarrollo	Satisfactorio	Ejemplar	Sugerencia de herramienta de evaluación
Contribución al trabajo en equipo (cumplimiento y calidad)	* Cumple muy pocas o ninguna de las tareas planificadas y asignadas a tiempo y casi no participa en las reuniones de planificación. * El trabajo realizado es incompleto e insuficiente para	* Cumple a tiempo menos del 50% de las tareas planificadas y asignadas y participa muy poco en las reuniones de planificación. * El trabajo realizado es de una calidad menor a la esperada y	* Cumple a tiempo casi todas las tareas planificadas y asignadas a tiempo y contribuye activamente a la planificación del equipo. * El trabajo realizado es de la calidad esperada de manera que se alcanzan	* Siempre cumple todas las tareas planificadas y asignadas a tiempo y siempre está pendiente y contribuyendo activamente a la planificación del equipo * El trabajo realizado es de mayor calidad del esperado de manera que	Uno o más de los siguientes: • Evaluación cruzada • Trabajo colaborativo con evidencia de contribución individual • Heteroevaluación por observación en una actividad diseñada

	cumplir los objetivos planteados. No muestra interés en la calidad del resultado.	cumple parcialmente los objetivos planteados.	los objetivos planteados.	se alcanzan los objetivos planteados. Además, ayuda y motiva a los demás miembros del equipo hacia la excelencia.	
Contribución a construir un ambiente inclusivo y colaborativo.	* No trata a los miembros del equipo con respeto (lenguaje verbal y no verbal) y no muestra interés por las ideas de los otros. * No considera propuestas o retroalimentación de los compañeros, ni ofrece sugerencias oportunas buscando acuerdos.	* Trata a los miembros del equipo con respeto, sin embargo, no muestra interés por las ideas de los otros. * Escucha propuestas o retroalimentación de los compañeros, pero no ofrece sugerencias oportunas buscando acuerdos.	* Promueve un clima positivo y colaborativo en el equipo, tratando a los miembros del equipo con respeto (lenguaje verbal y no verbal) y mostrando interés por las ideas de los otros. * Escucha propuestas o retroalimentación de los compañeros y está abierto a lograr acuerdos.	* Promueve un clima positivo y colaborativo en el equipo, tratando a los miembros del equipo con respeto (lenguaje verbal y no verbal), mostrando interés por las ideas de los otros y reconociendo sus méritos y contribución. * Escucha propuestas o retroalimentación de los compañeros y ofrece sugerencias oportunas, no solo buscando acuerdos sino también buscando formas de motivar y ayudar a sus compañeros.	Uno o más de los siguientes: • Evaluación cruzada • Heteroevaluación de evidencia de reuniones o diálogos del equipo • Heteroevaluación por observación en una actividad diseñada
Manejo de conflictos	* Evade o no reconoce los conflictos que se generan en el equipo, aceptando de forma pasiva lo que el resto de miembros decidan/discutan.	* Identifica la existencia de un conflicto en el equipo y escucha y participa de la discusión. * No propone alternativas de solución a conflictos de forma argumentada, ni contribuye a articular una con el consenso de los miembros.	* Identifica y aborda los conflictos que se generan en el equipo, de forma directa y constructiva. * Propone alternativas de solución a conflictos y considera propuestas de los demás, pero con dificultades para encontrar un consenso.	* Identifica y aborda los conflictos que se generan en el equipo, de forma directa, constructiva y buscando cohesión. * Propone alternativas de solución de forma argumentada y considera otras propuestas por los demás buscando el consenso. * De ser necesario, solicita ayuda oportunamente a personas externas o que puedan mediar en la resolución del conflicto.	Uno o más de los siguientes: • Evaluación cruzada • Heteroevaluación de evidencia de reuniones o diálogos del equipo

7. Habilidad para adquirir y aplicar nuevos conocimientos -según sean necesarios-, usando estrategias apropiadas de aprendizaje.

Criterio	Insatisfactorio	En Desarrollo	Satisfactorio	Ejemplar
Capacidad para adquirir nuevos conocimientos utilizando estrategias de aprendizaje adecuadas.	Límites para aprender lo que se enseña en clase. No incluye ninguna cita en el texto.	Lee información de diferentes fuentes, pero no incluye citas en el texto.	Lee información de diferentes fuentes e incluye citas en el texto.	Lee y sintetiza información de diferentes fuentes, entrevista a expertos e incluye citas en el texto
Capacidad para aplicar nuevos conocimientos.	No aplica nuevos conocimientos en eventos de la vida real.	Límites para aplicar lo enseñado en clase.	Aplica nuevos conocimientos en problemas de la vida real.	Aplica nuevos conocimientos en eventos de la vida real, escribe un resumen al respecto y hace recomendaciones para futuras aplicaciones.

8. Diseñar soluciones reales que proponen valor único como respuesta a necesidades específicas consideradas desde el punto de vista de los involucrados.

Criterio	Inicial	En Desarrollo	Satisfactorio	Ejemplar
Define el problema desde el punto de vista de los involucrados aplicando herramientas	No identifica correctamente a los involucrados o no redacta de manera clara y correcta el problema	Redacta el problema de manera clara y correcta, e identifica a los involucrados correctos, pero no evidencia tomar en cuenta sus puntos de vista porque no usa o usa de manera inadecuada los procedimientos y técnicas de investigación.	Redacta el problema de manera clara y correcta, e identifica a los involucrados correctos, pero no recoge de manera completa sus puntos de vista porque le falta aún dominar los procedimientos y técnicas de investigación.	Identifica a los involucrados y define el problema clara y correctamente desde la perspectiva de estos, mostrando dominio de las técnicas de investigación.
Propone una solución real (producto y/o servicio) y completa considerando diferentes	La solución propuesta no es clara o no es real.	Plantea una solución real (producto y/o servicio) pero de manera parcialmente clara o incompleta.	Propone una solución real (producto y/o servicio) que es completa y está bien definida, considerando factores	Propone una solución real (producto y/o servicio) que es completa y está bien definida, considerando factores económicos, ambientales, sociales,

factores importantes, así como otras opciones de solución.			económicos, ambientales, sociales, culturales y globales. No hay evidencia de haber explorado otras opciones de solución.	culturales y globales. Evidencia también haber explorado otras soluciones.
Defiende con argumentos el valor único de la solución para justificar su posible adopción	No se identifica claramente beneficios o desventajas de la solución sino solamente se dan sus características funcionales o técnicas.	Se identifican beneficios y desventajas de la solución, pero de manera ambigua o sin defenderlas con argumentos sólidos.	Se defiende con argumentos los beneficios y desventajas de la solución en relación con otras opciones y se ilustra con ejemplos claros el porqué habría adopción de los involucrados	Se defiende con argumentos los beneficios y desventajas de la solución en relación con otras opciones y se ilustra con ejemplos claros y con cifras cuantitativas el porqué habría adopción de los involucrados.

Rubrics: Engineering Accreditation Commission (EAC)

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

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Identify complex engineering problems	The problem is not identified or has not been validated with data.	The problem is not clearly identified, or the data is incomplete. Not all the stakeholders and disciplines involved have been identified. Incomplete analysis of the impact	The problem is identified using validated data. The student can identify all the stakeholders and disciplines involved. The student is able to measure the impact of the problem.	The problem is identified using validated data and shows benchmark within the industry or type of problem. The student can identify all the stakeholders and disciplines involved and shows analysis from different perspectives. The student is able to measure the impact of the problem, including social, economic and environmental aspects.
Formulate the complex engineering problem using engineering and mathematical tools	Does not apply the methods and/or models	Applies methods and analysis models not relevant to the problem, or applies models with several errors that compromise results	Applies the methods and analysis models appropriately, avoiding some system restrictions and/or with errors	Applies the relevant methods/mathematical models and analysis models, considering all system constraints
Propose solutions based on correct interpretation of results	Does not propose solutions and does not interpret model results	Proposes inconsistent solutions, or solutions based on incorrect interpretation of results	Proposes solutions based on correct interpretation of results, without considering all system restrictions	It proposes valued solutions, coherent with the system and the interpretation of the results of the models. Proposes cost effective solutions, coherent with the system constrains and the interpretation of the results of the models.

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.

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Identify opportunity/needs, and constraints.	The student does not identify the opportunity/needs or system's constraints.	The student identifies the opportunity/needs or constraints of the system, but are not critical	The student identifies the opportunity/needs and constraints of the system, based on class material only.	In addition to identifying opportunity/needs and constraints critical for the system, the student also offers an innovative analysis that expands class material.
Develop design specifications	The student does not develop system's specifications	The student develops system's specifications, but these are not critical. Considerations regarding public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors are not included.	The student develops critical specifications to fully model the system, although it may have non-critical errors	In addition to developing critical specifications for the system, the student proposes an innovative analysis that expands class material.
Analysis and synthesis	There is no evidence of data analysis or analysis based on reliable sources of information.	The student identifies design options without a clear methodology or successful use of collected data.	The student identifies design options applying a methodology and successfully using collected data, and considering most defined constraints.	The student identifies design options applying a methodology and successfully using collecting data, considering all defined constraints. Design options include further analysis of future applications and design implications for each option.

Develop system's prototypes or processes that satisfy specifications	The student does not present any prototypes or proposals	The student builds a prototype without an analysis, using intuition but without using any engineering tool. The chosen prototype does not satisfy the needs, constraints or specifications that were previously identified.	The student develops a design based on engineering tools, tested and chosen from different proposals, considering needs, constraints and specifications previously identified.	The student presents a design based on engineering tools, which has been evaluated and chosen from different proposals, considering needs, constraints and specifications previously identified. Innovative tools and concepts that had not been presented in class are considered as well.

3.a. An ability to communicate effectively with a wide range of audiences in Spanish.

Performance Criterion	Unsatisfactory	Developing	Satisfactory	Exemplary
VERBAL COMMUNICATION organization of ideas, lexis, visual aids, vocalization, intonation and pause management.	Speech lack's structure. The lexicon is not suitable for the audience. Vocalization and intonation are poor. The indications regarding the visual aid, nor the allotted time, are not respected.	Structure of the speech can be improved. The lexicon is partially suitable for the audience. Vocalization and intonation can be polished. Not all indications regarding visual aid are respected, and you fail to comply with the allotted time	Speech has, for the most part, a correct structure. The lexicon is relevant to the audience. Vocalization and intonation are quite adequate for most of the exposition. Visual aid is clear and pleasant. The allotted time is respected.	Speech presents a clear structure. The lexicon is formal / academic, suitable for the audience. Vocalization and intonation are totally spot on. Visual aid contributes to enriching what is exhibited. Include examples that illustrate the message. The allotted time is respected.
	Has no control over the use of the scaffolds and / or sound pauses; employs more than four.	Maximum use of four fillers and/or sound pauses.	Good management of pauses. Uses a maximum of two scaffolding supports, two fillers or voiced pauses.	Managing pauses contributes to understanding the message. Does not use fillers or voiced pauses.
NON-VERBAL COMMUNICATION Eye contact, body posture, use of hands, gesticulation, others.	Body posture, gesture expression, and eye contact do not support oral speech. Insecurity and / or rigidity is evident.	Body posture, gestures, and eye contact partially support oral speech. Some insecurity and / or rigidity is evident.	Body posture, gestures, and eye contact support oral speech. Shows confidence, preparation, and some enthusiasm.	Body posture, gestures, and eye contact express confidence, enthusiasm, and support oral speech. There is an excellent scenic domain.
WRITTEN COMMUNICATION Structuring of ideas; clarity and precision. Use of spelling rules.	Writing lacks structure and articulation. Ideas are ambiguous. Does not present sources to support ideas, or if it does, they are not reliable. Does not quote adequately, nor respect the word limit. Fails to apply spelling rules; has more than four errors. Vocabulary is not appropriate to the context.	Logical organization between the ideas can be improved. Occasionally, ideas are supported by sources that are reliable and / or relevant to the topic. Does not quote adequately, nor respect word limit. Doesn't always apply spelling rules; has one to four errors. Vocabulary is rarely appropriate to the context.	Writing articulates most of the ideas in an effective way, with logic. For most part, sources are reliable and related to the topic. Quotes correctly. Respects the word limit. Application of the language rules is correct; it may present an error. For most of writing, vocabulary is appropriate to context.	Ideas are fully articulated and effective; writing has logical and coherent structure. Reliable sources related to the topic are presented, which support the discourse. Quotes correctly. Respects word limit. There is mastery in the application of language rules. Throughout writing, a formal, academic and context-appropriate lexicon is used. There are no spelling errors.

3.b. An ability to communicate effectively with a range of audiences in English.

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
1. Oral and Written Presentation Structure	Lacks logical organization. It shows some coherence, but ideas lack coherence. Vocabulary is limited, casual, and colloquial.	Some information presented in logical sequence. Some points remain displaced and stray from the topic. Vocabulary is sometimes vague.	Is coherent and logically organized. Transitions used between ideas and paragraphs to create coherence. Vocabulary is clear.	Shows high degree of attention to logic and reasoning of points. Clearly leads the reader/listener to the conclusion and stirs thought regarding the topic. Vocabulary is highly appropriate for the context. It is very clear.

2. Written presentation /Task achievement	Is not logical, Ideas are present with details that may be irrelevant, inappropriate, or inaccurate. Continuous errors in spelling, grammar, syntax and/or punctuation making it difficult to read.	Is logical and solid. Ideas are present but could be more fully extended. Shows a pattern of errors in spelling, grammar, syntax and/or punctuation.	Is well-presented. Ideas are detailed, developed and supported. Has few errors in spelling, grammar, syntax and punctuation.	Is exceptionally well presented and argued. Ideas are detailed, well developed and supported with specific evidence and facts. Is free of distracting spelling, grammar, syntax and punctuation errors.
3. Oral Presentation Fluency and Pronunciation	Speech is slow, hesitant & strained except for short memorized phrases; inaudible. More than three mispronounced words	Speech is relatively smooth with some hesitation and unevenness Volume wavers. No more than two mispronounced words.	Fluid speech; few hesitations; a slight search for words. Inaudible word or two. No more than one mispronounced word.	Fluid speech; few to no hesitations; no attempts to search for words. Volume is excellent. No mispronounced words.

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

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Recognizes ethical dilemmas, concerned parties, and their consequences.	The student is unable to recognize an ethical problem in a particular personal or social situation.	The student is able to recognize the ethical problem and addresses it adequately but incompletely, that is, without being able to identify the concerned parties or the consequences.	The student is able to recognize the ethical problem including direct, indirect concerned parties and their consequences.	The student is able to recognize the ethical problem by identifying direct and indirect concerned parties, and their consequences. In addition, is able to identify from among interested parties who should take a position or a decision.
Identify issues that have an impact on society	The student does not identify any factors	The student identifies factors which are not relevant	The student identifies factors which are critical for the system considering contemporary issues	The student identifies and make a judgment based on those contemporary issues.
Select solution alternatives to solve society problems considering global, economic, environmental, and societal contexts	Does not generate alternatives	Generates alternatives but does not discriminate the appropriate alternative.	Generates alternatives and prioritizes without considering the impact of all the relevant context.	Generates alternatives and discriminates the appropriate, considering the impact in global, economic, environmental, and societal contexts.

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

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary	Suggested Assessment Tool
Contribution to teamwork (compliance and quality)	- Accomplishes very few or none of planned and assigned tasks on time and hardly participates in planning meetings. - The work carried out is incomplete and insufficient to meet the objectives set. Shows no interest in the quality of the result.	- Completes less than 50% of planned and assigned tasks on time and participates very little in planning meetings. - The work carried out is of a lower quality than expected and partially meets the objectives set.	- Completes nearly all scheduled and assigned tasks on time and actively contributes to team planning. - Work carried out is of the expected quality so that the objectives set are achieved.	- Always fulfills all planned and assigned tasks on time and is always on the lookout and actively contributing to team planning. - Work carried out is of a higher quality than expected so that the objectives set are achieved. Also helps and motivates the other members of the team towards excellence.	One or more of the following: • Cross evaluation • Collaborative work with evidence of individual contribution • Hetero evaluation by observation in a designed activity
Contribution to building an inclusive and collaborative environment.	- Does not treat team members with respect (verbal and non-verbal language) and does not show interest in the ideas of others. - Does not consider proposals or feedback from colleagues, or offer timely suggestions seeking agreements.	- Treats team members with respect yet shows no interest in other's ideas. - Listens to proposals or feedback from colleagues but does not offer timely suggestions looking for agreements.	- Promotes a positive and collaborative climate in the team, treating team members with respect (verbal and non-verbal language) and showing interest in the ideas of others. - Listens to proposals or feedback from colleagues and is open to reaching agreements.	- Promotes a positive and collaborative climate in the team, treating team members with respect (verbal and non-verbal language), showing interest in the ideas of others and recognizing their merits and contribution. - Listens to proposals or feedback from colleagues and offer timely suggestions, not only looking for agreements but also looking for ways to motivate and help colleagues.	One or more of the following: • Cross evaluation • Hetero evaluation of evidence from team meetings or dialogues • Hetero evaluation by observation in a designed activity

Conflict management	- Evades or does not recognize the conflicts that are generated in the team, accepting passively what the rest of the members decide / discuss.	- Identifies the existence of a conflict in the team, and listens and participates in the discussion. - Does not propose alternative solutions to conflicts in an argued way, nor contributes to articulate one with the consensus of the members.	- Identifies and addresses conflicts that are generated in the team, directly and constructively. - Proposes alternative solutions to conflicts and considers proposals from others but with difficulties to find a consensus.	- Identifies and addresses conflicts that are generated in the team, directly, constructively and seeking cohesion. - Proposes alternative solutions in an argued way and considers other proposals by seeking others' consensus. If necessary, requests help in a timely manner from external persons or those who may mediate in the resolution of the conflict.	One or more of the following: • Cross evaluation • Hetero evaluation of evidence from team meetings or dialogues

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

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Develop the problem in mathematical or statistical terms.	The student failed to develop the problem in mathematical or statistical terms	The student develops a mathematical or statistical relationship according to the propose problem, the rest are not in agreement.	Developed a mathematical or statistical relationship according to the problem, considering some customer needs in the develop.	The student was able to reach a correct develop of the proposed problem in mathematical or statistical terms, considering all the customer needs and constraints
Lead appropriately th e test or the experiment	The student does not follow any experimental procedure	The student performs experimental actions without any logic sequence or relation	The student follows an appropriate experimental procedure, but occasionally makes mistakes which may cause loss of efficiency and/ or loss of data	The student develops and implements an appropriate experimental procedure without mistakes
Synthesize the findings according to the problem proposed	The student does not find any relation between the conclusions and the proposed problem	The relations between the problem and the conclusion are not logical	Synthesizes the conclusions and the proposed problem logically; but does not incorporate the use of graphics, figures or statistics.	Synthesizes in a consistent way the conclusions and the proposed problem, based on the use of graphs, figures or statistics.
Make engineering judgements	The student does not dra w any conclusion nor propose a line of action	The conclusions and/or the propose d line of action are not based on available data and engineering knowledge	Draws conclusions based on available data and engineering knowledge, but does not propose a design or line of action, or these present minor errors	Draws logical conclusions and prop ose a design or line of action based on the available data, his/her experience and engineering knowledge

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

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Ability to acquire new knowledge using appropriate learnings strategies.	Limits to learn what is taught in class. Does not include any citation in the text.	Reads information from different sources but does not include citation in the text.	Reads information from different sources and include citations in the text.	Reads and synthesizes informatio n from different sources, interviews experts and include citations in the text.
Ability to apply new knowledge	Does not apply new knowledge in real – life events.	Limits to apply what is taught in class.	Applies new knowledge in real-life problems	Applies new knowledge in real-life events, write an abstract abou t it and makes recommendations for futur e applications.

8. To design real solutions with a unique value proposition to address specific needs considered from the point of view of stakeholders.

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Define the problem from the point of view of those involved applying tools.	Does not correctly identify those involved[4] or does not write the problem clearly and correctly.	Draws the problem clearly and correctly, and identifies the correct stakeholders, but does not prove taking their views into account because procedures and investigation techniques are either not used or misused.	Problem is clearly and correctly written, and the correct stakeholders are identified, points of view are not completely gathered because investigation procedures and techniques are yet to be mastered.	Identifies all involved and defines the problem clearly and correctly from their perspective, showing mastery of investigation techniques.
Propose a real[5] (product and/or service) and complete solution	The proposed solution is not clear or is unrealistic.	A real solution is presented (product and / or service) but only in partially clear or incomplete	A real solution is proposed (product and / or service) that is complete and well defined,	A real solution (product and / or service) is proposed that is complete and well defined,

considering different important factors, as well as other solution options.		way.	considering economic, environmental, social, cultural, and global factors. There is no evidence of having explored other solution options.	considering economic, environmental, social, cultural, and global factors. Evidence shows that other solutions have been considered.
Support with arguments the unique value of the solution to justify its possible adoption.	Benefits or drawbacks of the solution are not clearly identified, and only its functional or technical characteristics are given.	Benefits and drawbacks of the solution are identified, but in an ambiguous way or without supporting them with solid arguments.	Benefits and drawbacks of the solution are supported with arguments in relation to other options and illustrated with clear examples why there would be adoption by those involved.	Benefits and drawbacks of the solution in relation to other options are supported by arguments and are illustrated with clear examples and quantitative figures why there would be adoption by those involved.

[4]Includes people who are experiencing the problem and who would possibly adopt the solution. These people can be potential clients, users, or both. User is who would use the solution or part of it. Customer is the one who would pay for the solution or part of it.

[5] That it is feasible from professional disciplines (it is not science fiction).

Rubrics: Computing Accreditation Commission (CAC)

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Identifies a complex computing problem.	Does not identify a complex computing problem.	Identifies a problem, accomplishing one or two characteristics of complex problems.	Identifies a problem, accomplishing more than two characteristics of complex problems.	Identifies a problem and clearly defines all the characteristics of complex problems, in all possible contexts.
Proposes solutions to a complex computing problem applying principles of computing.	Does not propose a solution to a complex computing problem or does not use principles of computing.	Proposes a solution to a complex computing problem but does not applies principles of computing.	Using principles of computing solves a complex computing problem correctly.	Using principles of computing solves a complex computing problem correctly and consistent with assumptions and constraints.

Complex Problems include one or more of the following characteristics:

1. involving wide-ranging or conflicting technical issues,
2. having no obvious solution,
3. addressing problems not encompassed by current standards and codes,
4. involving diverse groups of stakeholders,
5. including many component parts or sub-problems,
6. involving multiple disciplines, or having significant consequences in a range of contexts

2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
Identifies the needs and constraints that are translated to design specifications.	Does not identify the specified needs and constraints thus cannot translate them into design specifications.	Identifies the specified needs and constraints partially or the design specifications does not meet them adequately.	Identifies the specified needs and constraints and the design specifications are met adequately.	Identifies the specified needs and constraints and the design specifications are adequate and/or efficient.
Implement a computing-based solution based on analysis.	Does not implement a solution or implements a solution without analysis.	Implements a solution with a partial analysis or is not consistent with design specification.	Implements a solution with a complete analysis and is consistent with most of the design specification.	Implements computing-based solutions that meets all the design specifications.
Evaluates the computing-based solution according to design specifications.	Does not evaluate any aspect of the proposed solution to verify whether meet the requirements.	Evaluates the computing-based solution considering design specifications partially.	Evaluates the computing-based solution considering most of the design specifications.	Evaluates the computing-based solution against requirements, meeting all the design specifications, including proposals for efficiency and improvements.

3a. Communicate effectively in a variety of professional contexts.

Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
VERBAL COMMUNICATION Organization of ideas, lexis, visual	Speech lacks of structure. The lexicon is not suitable for the audience. Vocalization	Structure of the speech can be improved. The lexicon is partially suitable for the audience. Vocalization and	Speech has, for the most part, a correct structure. The lexicon is relevant to the audience. Vocalization and	Speech presents a clear structure. The lexicon is formal / academic, suitable for the audience. Vocalization and intonation are

aids, vocalization, intonation and pause management.	and intonation are poor. The indications regarding the visual aid, nor the allotted time, are not respected.	intonation can be polished. Not all indications regarding visual aid are respected, and you fail to comply with the allotted time	intonation are quite adequate for most of the exposition. Visual aid is clear and pleasant. The allotted time is respected.	totally spot on. Visual aid contributes to enriching what is exhibited. Include examples that illustrate the message. The allotted time is respected.
	Has no control over the use of the scaffolds and / or sound pauses; employs more than four.	Maximum use of four fillers and/or sound pauses.	Good management of pauses. Uses a maximum of two scaffolding supports, two fillers or voiced pauses.	Managing pauses contributes to understanding the message. Does not use fillers or voiced pauses.
NON-VERBAL COMMUNICATION ***Eye contact, body posture, use of hands, gesticulation, others.***	Body posture, gesture expression, and eye contact do not support oral speech. Insecurity and / or rigidity is evident.	Body posture, gestures, and eye contact partially support oral speech. Some insecurity and / or rigidity is evident.	Body posture, gestures, and eye contact support oral speech. Shows confidence, preparation, and some enthusiasm.	Body posture, gestures, and eye contact express confidence, enthusiasm, and support oral speech. There is an excellent scenic domain.
WRITTEN COMMUNICATION Structuring of ideas; clarity and precision. Use of spelling rules.	Writing lacks structure and articulation. Ideas are ambiguous. Does not present sources to support ideas, or if it does, they are not reliable. Does not quote adequately, nor respect the word limit. Fails to apply spelling rules; has more than four errors. Vocabulary is not appropriate to the context.	Logical organization between the ideas can be improved. Occasionally, ideas are supported by sources that are reliable and / or relevant to the topic. Does not quote adequately, nor respect word limit. Doesn't always apply spelling rules; has one to four errors. Vocabulary is rarely appropriate to the context.	Writing articulates most of the ideas in an effective way, with logic. For most part, sources are reliable and related to the topic. Quotes correctly. Respects the word limit. Application of the language rules is correct; it may present an error. For most of writing, vocabulary is appropriate to context.	Ideas are fully articulated and effective; writing has logical and coherent structure. Reliable sources related to the topic are presented, which support the discourse. Quotes correctly. Respects word limit. There is mastery in the application of language rules. Throughout writing, a formal, academic and context-appropriate lexicon is used. There are no spelling errors.

3b. Communicate effectively in English in a variety of professional contexts.

Criteria	**Unsatisfactory**	**Developing**	**Satisfactory**	**Exemplary**
Oral and Written Presentation Structure	Lacks logical organization. It shows some coherence, but ideas lack coherence. Vocabulary is limited, casual, and colloquial.	Some information presented in logical sequence. Some points remain displaced and stray from the topic. Vocabulary is sometimes vague.	Is coherent and logically organized. Transitions used between ideas and paragraphs to create coherence. Vocabulary is clear.	Shows high degree of attention to logic and reasoning of points. Clearly leads the reader/listener to the conclusion and stirs thought regarding the topic. Vocabulary is highly appropriate for the context. It is very clear.
Written presentation /Task achievement	Is not logical, Ideas are present with details that may be irrelevant, inappropriate, or inaccurate. Continuous errors in spelling, grammar, syntax and/or punctuation making it difficult to read.	Is logical and solid. Ideas are present but could be more fully extended. Shows a pattern of errors in spelling, grammar, syntax and/or punctuation.	Is well-presented. Ideas are detailed, developed and supported. Has few errors in spelling, grammar, syntax and punctuation.	Is exceptionally well presented and argued. Ideas are detailed, well developed and supported with specific evidence and facts. Is free of distracting spelling, grammar, syntax and punctuation errors.
Oral Presentation Fluency and Pronunciation	Speech is slow, hesitant & strained except for short memorized phrases; inaudible. More than three mispronounced words	Speech is relatively smooth with some hesitation and unevenness. Volume wavers. No more than two mispronounced words.	Fluid speech; few hesitations; a slight search for words. Inaudible word or two. No more than one mispronounced word.	Fluid speech; few to no hesitations; no attempts to search for words. Volume is excellent. No mispronounced words.

4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

Criteria	**Unsatisfactory**	**Developing**	**Satisfactory**	**Exemplary**
Recognize ethical and legal principles in professional computing	Does not recognize neither ethical nor legal principles.	Recognizes ethical and legal principles, but not in professional computing	Recognizes ethical and legal principles in professional computing	Recognizes ethical and legal principles in professional computing

practice responsibilities.		practice responsibilities.	practice responsibilities.	practice responsibilities considering the impact in the society.
Make informed judgments in computing practice based on legal and ethical principles.	Does not make informed judgments in computing practice.	Makes informed judgments in computing practice, but not consider neither ethical nor legal principles.	Makes informed judgments in computing practice considering ethical and legal principles.	Makes informed judgments in computing practice considering ethical and legal principles and proposes amendments if needed.

5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

Criteria	**Unsatisfactory**	**Developing**	**Satisfactory**	**Exemplary**
Identifies roles within a team whose members together provide leadership.	Does not identify roles in the team. Does not have a clear purpose.	Not all roles are clear, there is no evident leadership.	Each member has an identified role and there is a clear leadership.	Members have a clear role and support each other tasks. The team keeps motivated and share leadership between members.
Creates a collaborative environment.	Does not treat team members with respect* and does not show interest in the ideas of others. Does not consider proposals or feedback from colleagues or offer timely suggestions seeking agreements.	Treats team members with respect yet shows no interest in other's ideas. Listens to proposals or feedback from colleagues but does not offer timely suggestions looking for agreements.	Promotes a positive and collaborative climate in the team, treating team members with respect* and showing interest in the ideas of others. Listens to proposals or feedback from colleagues and is open to reaching agreements.	Promotes a positive and collaborative climate in the team, treating team members with respect*, showing interest in the ideas of others and recognizing their merits and contribution. Listens to proposals or feedback from colleagues and offer timely suggestions.
Establishes goals, plan tasks and meet objectives as a team.	Does not establish goals, plan tasks and meet objectives as a team.	Establishes goals and plan tasks that don't necessarily meet the objectives of the work.	Establishes goals, plans tasks and meets objectives as a team.	Establishes goals, plans tasks and meets objectives as a team considering efficiency.

* Verbal and non-verbal language

6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Criteria	**Unsatisfactory**	**Developing**	**Satisfactory**	**Exemplary**
Selects an appropriate solution based on computer science theory for a given problem.	Does not propose any appropriate solution based on computer science theory.	Proposes an appropriate solution, but incorrectly applying computer science theory.	Proposes an appropriate solution based on computer science theory in an effective manner.	Proposes an appropriate solution based on computer science theory in an effective and efficient or innovative manner.
Implements the appropriate solution using software development fundamentals.	The implemented solution does not comply with any of studied software development fundamentals.	More than one software development fundamental is applied incorrectly in the implementation of the selected solution.	Applies software development fundamentals correctly in the implementation of selected solution.	Applies software development fundamentals correctly in the implementation of the selected solution and proposes future improvements.

7. An ability to lead, manage and undertake projects.

Criteria	**Unsatisfactory**	**Developing**	**Satisfactory**	**Exemplary**
Identifies an opportunity to satisfy a specific need.	No opportunity is identified.	An opportunity statement is declared based on either intuition or weak analysis.	An opportunity is clearly identified and declared, based on a robust analysis from the application of needs-finding tools.	An innovative and with high impact on society opportunity is clearly identified and declared, based on a robust analysis from the application of needs-finding tools.
Identifies stakeholders for the project development.	No stakeholders are identified.	Stakeholders are identified but is unclear how their feedback contributes to the opportunity statement and solution development.	Stakeholders are identified and is clear how their feedback contributes to the opportunity statement and solution development.	Stakeholders are identified and is clear how their feedback contributes to the opportunity statement and solution development. The analysis also includes feedback from "*extreme users*" for more insightful findings.
Develops an effective solution (product or service) that meets the needs identified initially.	No solution is proposed or developed.	A solution is proposed or developed, but it lacks evidence of acceptance.	A solution is proposed or developed, supported with evidence of acceptance.	In addition to being accepted and evidencing how needs are met, solutions surpass expectations.

CÚMPLASE Y NOTIFÍQUESE, dado y firmado en la ciudad de Guayaquil.

Particular que notifico para los fines de Ley.

Atentamente,

Firmado electrónicamente por:
STEPHANIE DAYANA QUICHIMBO CORDOVA

Ab. Stephanie Quichimbo Córdova, Mg.
SECRETARIA ADMINISTRATIVA

JLC/SQC