**TABLE 4:** **DETAIL OF CORRESPONDENCE BETWEEN THE GRADUATE ATTRIBUTES AND LEARNING OUTCOMES OF SUBJECTS OF THE CURRICULUM OF THE PROGRAM.**

Based on the findings in Table 1, the program will detail here learning outcomes that achieve the Graduate Attributes are part of the formation of the engineer:

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| --- |
| 1. **Engineering Knowledge:**

**WA1:** Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems. |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK1:** A systematic, theory-based understanding of the **natural sciences** applicable to the discipline. |  |
| **WK2:** Conceptually-based **mathematics**, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modeling applicable to the discipline. |  |
| **WK3:** A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline. |  |
| **WK4:** Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is as the forefront of the discipline. |  |
| 1. **Problem Analysis:**

**WA2:** Identify, formulate, research literature and analyse *complex* engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences (WK1 to WK4) |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK1:** A systematic, theory-based understanding of the **natural sciences** applicable to the discipline. |  |
| **WK2:** Conceptually-based **mathematics**, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modeling applicable to the discipline. |  |
| **WK3:** A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline. |  |
| **WK4:** Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is as the forefront of the discipline. |  |
| 1. **Design/ development of solutions:**

**WA3:** Design solutions for *complex* engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (WK5). |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK5:** Knowledge that supports **engineering design** in a practice area. |  |
| 1. **Investigation:**

**WA4:** Conduct investigations of *complex* problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions. |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK8:** Engagement with selected knowledge in the **research literature** of the discipline. |  |
| 1. **Modern Tool Usage:**

**WA5:** Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to *complex* engineering problems, with an understanding of the limitations (WK6). |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK6:** Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline.  |  |
| 1. **The Engineer and Society:**

**WA6:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems (WK7). |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK7: Comprehension of** the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability. |  |
| 1. **Environment and Sustainability:**

**WA7:** Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts (WK7). |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK7: Comprehension of** the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability. |  |
| 1. **Ethics:**

**WA8:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice (WK7). |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| **WK7: Comprehension of** the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability. |  |
| 1. **Individual and Team work:**

**WA9:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings. |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings. |  |
| 1. **Communication:**

**WA10:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. |  |
| 1. **Project Management and Finance:**

**WA11:** Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.  |  |
| 1. **Lifelong learning:**

**WA12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.  |
| *The learning process should allow graduates to demonstrate:* | ***Explain/detail the competencies or learning outcomes of the subjects of the curriculum that are oriented towards achieving the results indicated for this attribute.*** |
| Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.  |  |