1. Academic Standards

- **Adopted Academic Standards (NARS/ARS): ARS**

Academic Reference Standards (ARS) developed for Production and Mechanical Engineering Programs.

National Academic Reference Standards (NARS 2018) and Academic Reference Standards (ARS)			
NARS		ARS	
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**A1**	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
A2	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.	**A2**	Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.	**A3**	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	**A4**	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
A5	Practice research techniques and methods of investigation as an inherent part of learning.	**A5**	Practice research techniques and methods of investigation as an inherent part of learning.
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	**A6**	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
A7	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.	**A7**	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.

A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	**A8**	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	**A9**	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	**A10**	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.
B1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.	**B1**	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.
B2	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.	**B2**	Plan, manage and carry out designs of mechanical systems and machine elements using appropriate materials both traditional means and computer-aided tools and software contemporary to the mechanical engineering field.
B3	Select conventional mechanical equipment according to the required performance.	**B3**	Select conventional mechanical equipment according to the required performance.
B4	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to design, build, operate, inspect and maintain mechanical equipment and systems.	**B4**	Adopt suitable national and international standards and codes; and integrate legal, economic and financial aspects to design, build, operate, inspect and maintain mechanical equipment and systems.
		C1	Apply basic theories to production processes, including new techniques in manufacturing, to select appropriate processes and process standards for specific products.
		C2	Design systems, machines, tools and products by applying appropriate standards and developing necessary calculations, construction and operating drawings.
		C3	Implement the fundamentals of industrial engineering to analyze, plan, and design production systems.

	C4	Demonstrate additional capabilities related to the area of focus in design and production engineering and identify appropriate materials for a specific application.