

1.Competencies for Engineering Graduates NARS 2018

1.1. COMPETENCIES OF ENGINEERING GRADUATE

The Engineering Graduate must be able to:

- 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.
- 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.
- 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.
- A7. Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
- 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.
- A10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

In addition to the Competencies for All Engineering Programs the BASIC ELECTRICAL Engineering graduate and similar programs must be able to:

B1 Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.

B2 Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.

B3 Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.

B4 Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.

B5. Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain digital communication equipment, systems and services

In addition to the Competencies for All Engineering Programs the BASIC ELECTRICAL Engineering graduate and similar programs must be able to be a

Communication and electronics engineering (ARS): C1. Engineering principles in the fields of WIFI and YI-MAX communication of wireless systems, VLSI, Sensor and biomedical engineering.

C2. Engineering principles in the fields of information security and Digital signal Processing techniques.

C3. Basics of design and analyzing electronic engineering systems, methods of VLSI and IC Fabrications while considering the constraints of applying inappropriate technology and the needs of commercial risk evaluation.

C4. Basics of design and analysis of microwave applications, Photonics and optical

1.2 THE ATTRIBUTES OF THE ENGINEER

General Attributes

The Engineering Graduate must:

1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;
2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;
3. Behave professionally and adhere to engineering ethics and standards;
4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;
5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles;
7. Use techniques, skills and modern engineering tools necessary for engineering practice;
8. Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;

9. Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;
10. Demonstrate leadership qualities, business administration and entrepreneurial skills.
- 11- Engage in self- and life-long learning.
- 12- Apply basic knowledge and concepts of mathematics, sciences and engineering principles to electronic and communication systems.
- 13- Manipulate with the electronic circuits and systems, all the way from discrete components level, circuits analysis and design, to build, operate, maintain and troubleshoot with emphasis on electronic power devices.
- 14- Design, build, operate and maintain mobile, digital and analog communication systems, as well as data and mobile communications.
- 15- Manipulate with the photonics and optical Communication systems, Satellite, Microstrip antennas, and microwave applications and Deal with Ultra high frequency techniques.
- 16- Apply control theory and measurement systems for industrial variable, signal conversion, conditioning, and processing.