2.6 Student Performance and Learning Outcome

2.6.1 Program Outcomes (POs)

Summary

Program outcomes define the overarching skills, knowledge, and abilities that students are expected to acquire upon completing a degree or certification program. They provide a holistic view of what graduates should know and be able to do, ensuring that the program aligns with industry standards and educational goals. These outcomes typically address a range of competencies, including technical skills, critical thinking, and professional behaviours. Clear program outcomes guide curriculum development, assessment strategies, and continuous improvement efforts, ensuring that the program effectively prepares students for their careers and further academic pursuits.

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Program Outcomes

Program outcomes are statements that describe the knowledge, skills, abilities, and attributes that students are expected to have acquired by the time they complete a program of study. These outcomes are designed to reflect the broader educational goals and objectives of the program, and they guide the curriculum, teaching methods, and assessment strategies throughout the program.

POs are statements that describe what the students graduating from engineering programs should be able to do at the time of graduation.

The NBA(National Board of Accreditation) has set 12 Program Outcomes, which are as follows:

(A) Program Outcomes (POs)

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analyses**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis, and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual

knowledge to assess societal, health, safety, legal and cultural issues and the

consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: 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.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: 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.

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