

Department of Polymer & Petrochemical Engineering (PPD)
NED University of Engineering & Technology (NED UET)
Introduction to Outcome Based Education (OBE) for students

(In line with Pakistan Engineering Council (PEC) accreditation manual 2014)



Pakistan Engineering Council
Regulating the Engineering Profession

PEC is a statutory body to regulate the engineering profession including quality of education in Pakistan. Accreditation by PEC is mandatory for you to get HEC attested engineering degree in Pakistan.



The Washington Accord, originally signed in 1989, is an international accreditation agreement for professional engineering academic degrees signed between bodies responsible for accreditation in its signatory countries. PEC became a full-signatory member of The Washington Accord on June 21, 2017.

What Does It All Mean to Engineering Students?

If a student degree program is accredited on the Outcome-Based Education (OBE) system of The Washington Accord then you can easily go and study or work in any of the signatory countries without having clear any competitive or equivalence examination.

What is Outcome Based Education (OBE)?

Outcomes based education is a student-centered teaching and learning methodology to education that focuses on what a student should be able to do in the real world upon completion of their course or program.

It focuses on measuring student performance that is outcomes at different levels e.g. At the end of each course.

The main goal of OBE is to bridge education and employability.

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Sequences of steps in OBE are as follows;

- Identify the outcomes of the degree program
- The curriculum is designed based on the identified outcomes
- Classroom and Laboratory instructions and assessments are developed to achieve these outcomes
- Relationship between curriculum design and employability is evaluated.

Benefits of OBE:

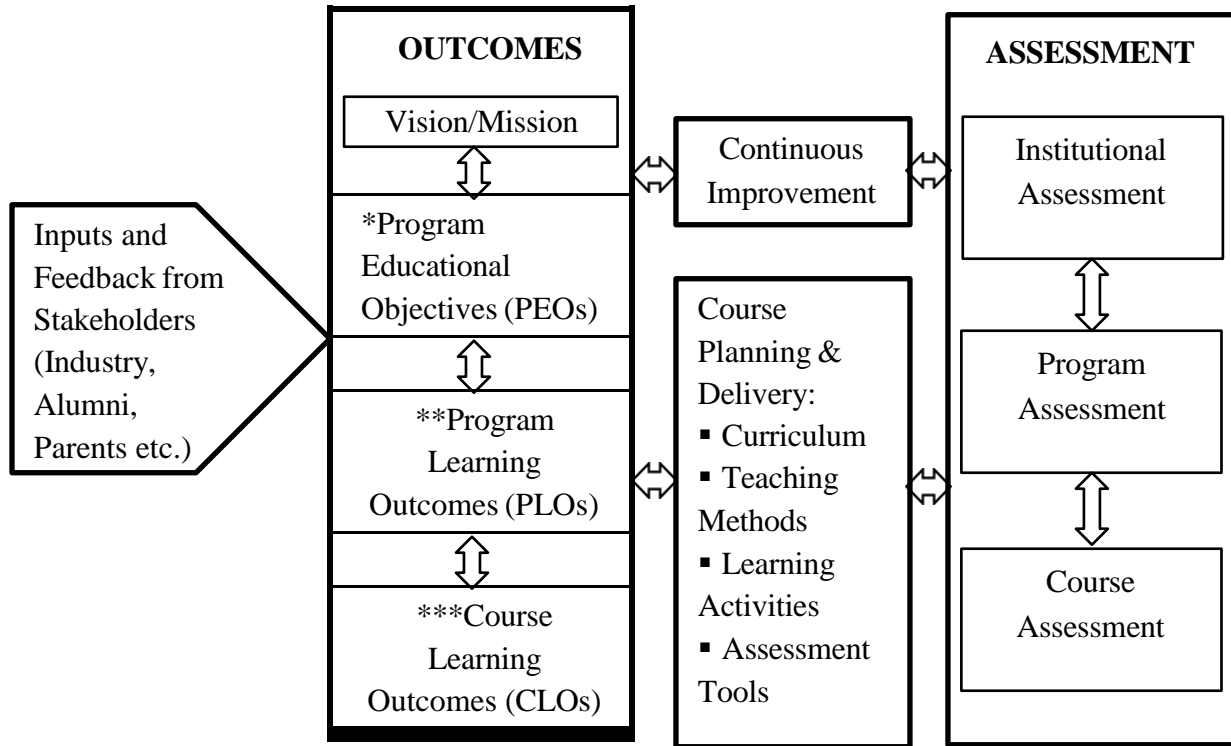
- Provide a strategic way to enhance the quality of teaching and learning;
- Prepare students for the “rest-of-life” context in which they will need to apply what they have learned in their course/program;
- provide a framework to align teaching, learning and assessment methods;
- Promote a collaborative, collegial approach to curriculum planning;
- Help to ensure the approval and accreditation of new and existing programs;
- Provide a mechanism for ensuring accountability and quality assurance;
- Promote a self-directed and autonomous approach to learning;
- Provide a means for students to articulate the knowledge, skills, attitudes and experience acquired during their program;
- Provide a tool for monitoring, evaluating and improving the curriculum; and
- Help to encourage continuity and mobility between varying post-secondary programs and institutions.

What are the Benefits of OBE to Students?

- Clarity: Students will understand what is expected from them and teachers will know what they need to teach during the course.
- Pliability: OBE is meant to be a student-centered learning methodology. Teachers are meant to facilitate and help the students in understanding the learning material in various ways.
- Participation: Students participation is the key part of OBE. Students are expected to do their own learning, so that they gain a full understanding of the material.
- Employment Opportunities: Under the umbrella of The Washington Accord the students get equivalence of accredited professional degrees offered by the signatory countries. Thus accredited engineering graduates through this accord will have the freedom to work in any signatory countries (e.g. USA, UK, New Zealand etc.) without any equivalence examination.

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The OBE Framework



***Program Educational Outcomes (PEOs):** The statements that describe the expected achievements of graduates in their career, and also in particular, what the graduates are expected to perform and achieve during the first few years after graduation.

****Program Learning Outcomes (PLOs):** The narrower statements that describe what students are expected to know (graduate attributes (GA)) and be able to do by the time of graduation.

*****Course Learning Outcomes (CLOs):** Course Learning Outcomes describe the complex performances a student should be capable of as a result of learning experiences within a course.

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Vision of the NED University of Engineering & Technology

“be a leader in enabling Pakistan's social and economic transformation”.

Mission of the NED University of Engineering & Technology

“acquire education and research excellence in engineering and allied disciplines to produce leadership and enabling application of knowledge and skills for the benefit of the society with integrity and wisdom”.

Vision of the Faculty of Chemical and Process Engineering

Our faculty strives to “to produce engineers with sound engineering knowledge capable of serving in challenging environments”.

Vision of the Department of Polymer & Petrochemical Engineering

To become a leading institute of national and international repute in the field of Polymer & Petrochemical engineering and exceptionally contribute to solve the technological needs of the global economy and human society.

Mission of the Department of Polymer & Petrochemical Engineering

The Polymer & Petrochemical Engineering Department is dedicated “to produce professional engineers equipped with theoretical and practical knowledge and skills enabling them to ethically lead and contribute in the constant growth of the knowledge-base and sustainable improvement in the polymer and petrochemical industries, nationally and internationally”.

Program Educational Outcomes (PEOs) of PPD:

PEO-1: Demonstrate strong competence in Polymer & Petrochemical Engineering discipline resulting in a dynamic professional career.

PEO-2: Exhibit strong leadership, management, and communication skills in multi-disciplinary environments.

PEO-3: Manifest engineering ethics considering sustainability, societal & environmental well-being and provide comprehensive solution to global challenges.

PEO-4: Engage in life-long learning, research, and innovation over the career.



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Program Learning Outcomes (PLOs)

The graduates of Polymer & Petrochemical Engineering will demonstrate the following attributes for their professional career.

- 1. Engineering Knowledge:** Apply knowledge of mathematics, natural science, engineering fundamentals and Engineering specialization to the solution of complex engineering problems
- 2. Problem Analysis:** Identify, formulate, conduct 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:** An ability to 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
- 4. Investigation:** Conduct investigation of complex Engineering problems using research-based knowledge and research methods, including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions
- 5. Tool Usage:** 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
- 6. The Engineer and The World:** Analyze and evaluate sustainable development impacts to society, the economy, sustainability, health and safety, legal frameworks, and the environment while solving complex engineering problems
- 7. Ethics:** Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion
- 8. Individual and Collaborative Team Work:** Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings
- 9. Communication:** Communicate effectively and inclusively 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, and make effective presentations, taking into account cultural, language, and learning differences
- 10. Project Management And Finance:** 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 in multidisciplinary environments
- 11. Lifelong Learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change.

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PEOs 	PEO-1: Demonstrate strong competence in Polymer & Petrochemical Engineering discipline resulting in a dynamic professional career PEO-2: Exhibit strong leadership, management, and communication skills in multi-disciplinary environments PEO-3: Manifest engineering ethics while addressing societal, environmental, and global technical and non-technical problems PEO-4: Engage in life-long learning, research, and innovation over the career			
PLOs 				
Program Learning Outcomes (PLOs)	PEO-1	PEO-2	PEO-3	PEO-4
PLO 1: Engineering Knowledge	✓			
PLO 2: Problem Analysis	✓			
PLO 3: Design / Development of solutions	✓			
PLO 4: Investigation	✓			
PLO 5: Tool Usage	✓			
PLO 6: The Engineer and the World			✓	
PLO 7: Ethics			✓	
PLO 8: Individual and Collaborative Team Work		✓		
PLO 9: Communication		✓		
PLO 10: Project Management and Finance		✓		
PLO 11: Lifelong Learning				✓