



DHA SUFFA UNIVERSITY
DEPARTMENT OF
MECHANICAL ENGINEERING

**STUDENT GUIDE TO OUTCOME-
BASED EDUCATION**

OBE
MANUAL

Everything your degree is designed to make you capable of
— and how you will be asked to prove it.

**ELEVEN PROGRAM LEARNING OUTCOMES · DEPARTMENT OF
MECHANICAL ENGINEERING**

Accredited by the Pakistan Engineering Council

Built on the Washington Accord graduate attributes (2021 revision).

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START HERE

Your degree, decoded.

Outcome-Based Education is not a separate programme, a new syllabus or an extra exam. It is the rulebook your degree is built on — and it is the reason your qualification travels.

What's inside

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Pakistan Engineering Council

The statutory body that regulates the engineering profession — and the quality of engineering education. PEC accreditation is mandatory for an HEC-attested engineering degree.



The Washington Accord

An international agreement recognising engineering degrees as substantially equivalent across its signatory countries. PEC has been a full signatory since 21 June 2017 and applies the Accord's graduate attributes when accrediting your programme.

How to use this booklet

Page 4 is the one to photograph — all eleven outcomes on a single sheet.

Pages 5–6 give the official wording, the version your rubrics quote.

Page 7 tells you where each outcome is actually marked.

11

OUTCOMES

The graduate attributes

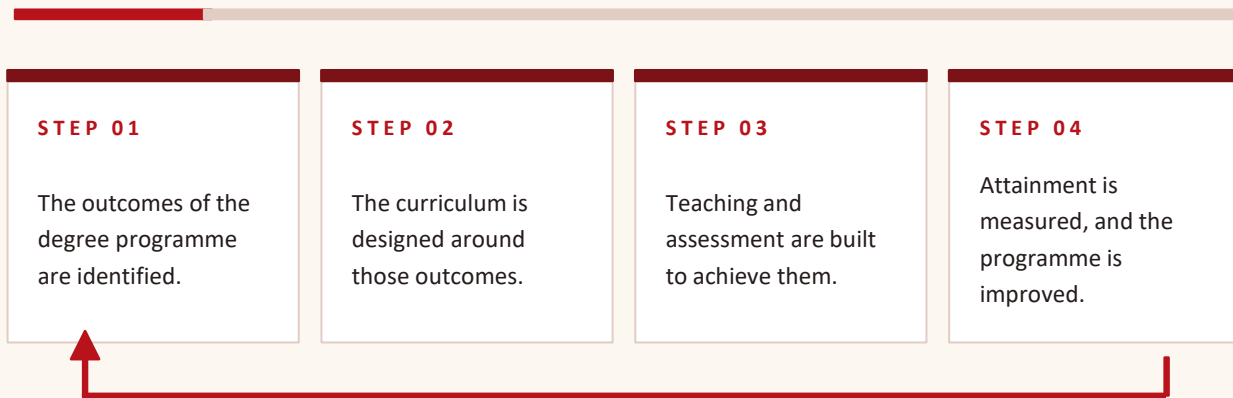
The Accord defines eleven attributes every graduate of an accredited programme must hold. Your department writes them into this programme as Program Learning Outcomes — the eleven on page 4.

So what does that mean for you?

Because your programme is accredited on the OBE system of the Washington Accord, your degree is recognised in the signatory countries without an equivalence examination — whether you go on to work or to postgraduate study. The eleven outcomes in this booklet are the currency that recognition is written in.

Designed backwards.

First we agree what a graduate must be able to do. Then — and only then — we build the courses, the teaching and the assessments that get you there. Everything in your degree points at an outcome.



Feedback from industry, alumni and from your own course surveys closes the loop — which is why the list of outcomes is reviewed, and occasionally rewritten.

WHY IT IS WORTH YOUR ATTENTION

Four things OBE gives you



Clarity

You know what is expected of you — and your teachers know exactly what they must teach and assess.



Flexibility

A student-centred model. There is more than one route to demonstrating that you have met an outcome.



Involvement

You own your learning. Labs, projects and design work are the system, not an extra.



Mobility

Freedom to work in the Accord's signatory countries without an equivalence examination.

11

Outcomes. All of them mandatory.

There is no separate "PLO exam". The eleven are assessed through the courses you already take — every quiz, lab report, design project, viva and final paper is evidence against one of them.

WHERE THE ELEVEN COME FROM

A chain that ends on your course outline

The Accord Eleven graduate attributes, agreed internationally	PEC Written into the accreditation manual for Pakistan	Your programme Adopted as the eleven Program Learning Outcomes	Your courses Mapped to CLOs on every course outline you get
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Nothing here is arbitrary.

Every outcome traces back through the department's objectives to the university's mission — and forward into the career you will have five years after you graduate.



University's Mission

To achieve higher standards in teaching, learning and research for becoming a world renowned academic institution.



University's Vision

To become a globally recognized institution of higher education and research, which would extend the frontiers of knowledge and contribute significantly in nation building.

Program Educational Objectives

The graduates of the Bachelor of Engineering (Mechanical) programme, within five years after graduation, must:

- 1 **Be effective professional engineers** having sound engineering knowledge and practice.
- 2 **Be responsible engineers**, who exercise good ethics in their professional pursuits with due consideration to impact on society.
- 3 **Be active engineers** who advance their knowledge, effectively communicate complex engineering ideas and solutions, and adapt to technological changes in the field of mechanical engineering.

ONE LINE OF SIGHT

From one lab report to your career

CLOs	PLOs	PEOs	Mission
What you can do at the end of a course	What you can do on graduation day — the eleven	Where you should be five years out	What the university is here to do

A fluid-mechanics investigation is marked against a CLO of that course; that CLO is mapped to one or more PLOs — here, Investigation and Communication. Four years of those marks become the evidence that you have met all eleven.

And it runs the other way too

Attainment is measured, reviewed and reported when the programme is accredited. Where a cohort falls short, the fix lands back in the curriculum. Your course surveys are part of that evidence — the least glamorous and most useful reason to fill them in properly.

The eleven, at a glance



01

Engineering Knowledge

Bring the right maths, science and engineering fundamentals to a real problem.



02

Problem Analysis

Break a messy problem down and back your conclusions with evidence.



03

Design / Development of Solutions

Design creatively — for safety, whole-life cost and carbon, not just function.



04

Investigation

Plan an experiment, read the data honestly, and say what it proves.



05

Tool Usage

Use modern tools — and know where each one stops being trustworthy.



06

The Engineer and the World

Weigh society, economy, sustainability, safety, law and environment together.



07

Ethics

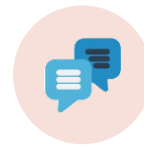
Do the right thing unwatched — and make room for everyone.



08

Individual and Collaborative Team Work

Deliver alone, in a lab group, and across a distributed team.



09

Communication

Reports, drawings and presentations — clear to an expert and a client.



10

Project Management and Finance

Scope, schedule and cost a project — not just build it.



11

Lifelong Learning

Keep learning: some tools you will use in 2035 do not exist yet.

11

ALL MANDATORY

Every one of them must be demonstrated before your degree is awarded.

Outcomes 1–6



Engineering Knowledge

01

Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization, to develop solutions to complex engineering problems.

IN PLAIN WORDS

You bring the right maths, science and mechanical engineering fundamentals to a real problem.



Problem Analysis

02

Identify, formulate, research literature and analyse complex engineering problems, reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences, with holistic considerations for sustainable development.

IN PLAIN WORDS

You break a messy problem down and back your conclusions with evidence.



Design / Development of Solutions

03

Design creative solutions for complex engineering problems, and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon, as well as resource, cultural, societal and environmental considerations.

IN PLAIN WORDS

Your design is judged on creativity and on safety, cost and carbon across its whole life.



Investigation

04

Conduct investigations of complex engineering problems using research methods — including research-based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information — to provide valid conclusions.

IN PLAIN WORDS

You can plan an experiment, read the data honestly, and say what it does — and doesn't — prove.



Tool Usage

05

Create, select and apply — and recognise the limitations of — appropriate techniques, resources and modern engineering and IT tools, including prediction and modelling, for complex engineering problems.

IN PLAIN WORDS

You use CAD, CAM, FEA/CFD and code, and you know where each tool stops being trustworthy.



The Engineer and the World

06

When solving complex engineering problems, analyse and evaluate sustainable development impacts on society, the economy, sustainability, health and safety and the environment. One outcome now covers what older lists split in two.

IN PLAIN WORDS

Every solution lands in a real world — weigh its effect on people, money, safety and the planet.

Outcomes 7–11



Ethics

07

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.

IN PLAIN WORDS

You do the right thing when nobody is checking — and you make room for everyone on the team.



Individual and Collaborative Team Work

08

Function effectively as an individual, and as a member or leader in diverse and inclusive teams, and in multidisciplinary, face-to-face, remote and distributed settings.

IN PLAIN WORDS

You pull your weight alone, in a lab group, and on a project run half over email.



Communication

09

Communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large — writing effective reports and design documentation, and making presentations that account for cultural and language differences.

IN PLAIN WORDS

Reports, drawings, vivas and presentations — clear to an expert and to a client.



Project Management and Finance

10

Apply knowledge and understanding of engineering management principles and economic decision-making, and apply these to your own work, as a member and leader in a team, to manage projects in multidisciplinary environments.

IN PLAIN WORDS

You can scope, schedule and cost a project — your FYDP included — not just build it.



Lifelong Learning

11

Recognise the need for, and have the preparation and ability for, (i) independent and lifelong learning, (ii) adaptability to new and emerging technologies, and (iii) critical thinking in the broadest context of technological change.

IN PLAIN WORDS

Your degree is a licence to keep learning — some tools you'll use in 2035 don't exist yet.

11

OF 11 REQUIRED

Miss one and the set is incomplete. They are assessed through your courses — so the work you do this semester is already counting.

HOW YOU ARE ASSESSED

No separate exam. Just everything else.

Every course carries its own Course Learning Outcomes, and each CLO is mapped to one or more of the eleven. Your quizzes, assignments, lab reports, design projects, vivas and papers are the evidence.

What is expected of you

- 1 Be **ready to demonstrate** what you know.
- 2 **Accept responsibility** for what you don't know yet.
- 3 Be prepared to **keep achieving** and reach high performance.
- 4 Accomplish **all eleven outcomes** to earn your degree.

Make OBE work for you

- ☐ Read the CLOs on the first page of every course outline.
- ☐ Check which outcome each assessment feeds — it is usually on the rubric.
- ☐ Ask for the rubric before you start a report or project.
- ☐ Treat labs, design work and your FYP as evidence, not just marks.
- ☐ Answer course and exit surveys honestly — they close the loop.

Quick glossary

OBE — Outcome-Based Education

PEO — Program Educational Objective (5 years out)

PLO — Program Learning Outcome (graduation day)

CLO — Course Learning Outcome (end of a course)

PEC — Pakistan Engineering Council

WA — Washington Accord

GA — Graduate Attribute — the Accord's term

FYDP — Final Year Design Project



Questions? Talk to your Student Advisor.

Developed by the OBE Program Team, Department of Mechanical Engineering, DHA Suffa University.

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