Pakistan Engineering Council

Program Evaluation Report

(Accreditation/Re-accreditation)

PROGRAM EVALUATION WORKSHEET

RUBRICS defining D, W and C

1) For all accreditation criteria, the findings shall be recorded under 'Compliance' column as: 'Y' for Compliance 'C' for Concern, 'W' for Weakness, 'D' for Deficiency or 'OFI' for Opportunity for Improvement.

2) In case of 'C', 'W' or 'D', justification must be provided under 'Observation and Remarks' **column.**

Number Legend Used:

1	**"1"** appearing in any assessment attribute signifies a **Deficiency (D)** towards the main criteria
2	**"2"** appearing in any assessment attribute signifies a **Weakness (W)** towards the main criteria
3	**"3"** appearing in any assessment attribute signifies a **Concern (C)** towards the main criteria
4	***"4"*** appearing in any assessment attribute signifies an ***Opportunity for Improvement (OFI)*** *towards the main criteria*

Sr. No.	Criteria	Observations and Remarks For Non- Compliance	
	Criterion-1: Program Educational Objectives (PEOs)		
i.	Well-defined and published Institute Vision and Mission.	Institute Vision and mission are not defined.	**(D1)**
		Defined but not published; OR Not approved by relevant statutory bodies	**(W3)**
		Not published as public document	**(C3)**
ii.	PEOs are defined, consistent with the Vision / Mission, and well publicized.	PEOs are not defined.	**(D1)**
		PEO statement is not suitable/ repetition of PLOs	**(W2)**
		i) There are some issues with PEOs' alignment with Vision/Mission; OR ii) The PEOs are too narrow or too broad; OR iii) Not very well published as public documents; OR iv) Reasonably defined but not aligned with V&M	**(C3)**
iii.	Involvement of stakeholders in formulation / review of PEOs.	System does not have any mechanism for involvement of stakeholders	**(D2)**
		Process partially defined AND no formal evidence showing involvement of stakeholders so far	**(W3)**

		Informal involvement of stakeholders seen	**(C3)**
iv.	A process in place to evaluate the attainment of PEOs.	No process defined	**(D2)**
		Process is defined but assessment tools/KPIs are nonexistent	**(W2)**
		i) Assessment tools/KPIs defined but are inadequate; OR ii) Evaluation mechanism and allocation of responsibilities of entities are not clear / confusing; OR iii) Weak correlation of the survey forms/ Questionnaire with PEO statements and lack of evidence/ data (in case process exists and survey forms are there)	**(C3)**
v.	PEOs are attained and evaluation results being used for continuous improvement (CQI) of the program	CQI process at PEO level is not initiated/ implemented	**(D2)**
		i) Assessment data gathered, but no analysis and evaluation carried out; OR ii) Corrective actions based on evaluation results are not identified and no implementation plan worked out	**(W2)**
		Corrective actions are identified but not implemented; OR Only partially implemented.	**(C3)**
		Incomplete duration of program accreditation cycle after graduation (3-5 years of assessment frequency is required)	**N/A**
	Criterion-2: Program Learning Outcomes (PLOs)		
i.	PLOs are well-defined and publicized.	Not defined at all	**(D1)**
		Defined but not approved from the concerned Statutory Bodies	**(W2)**
		Insufficient justification of fulfillment of Graduate Attributes defined by EAB	**(C3)**
ii.	PLOs are appropriately linked to PEOs	Not linked	**(D2)**
		Linked but not supportive to all PEOs	**(W3)**
		Some key points in PEOs are not addressed in PLOs	**(C3)**
iii.	PLOs encompass all the required Graduate Attributes as defined in EAB Accreditation Manual	Do not encompass the PEC GAs in totality	**(D1)**
		Partially encompass	**(W2)**
iv.	Mapping of Courses to PLOs	No mapping is given.	**(D1)**
		Mapping is there but all PLOs are not adequately supported.	**(W3)**

		Mapping does not cover all the three Learning domains i.e. Cognitive, Psychomotor and Affective	**(C3)**
v.	Teaching-learning and assessment methods appropriate and supportive of the attainment of PLOs	Teaching/ assessment methods not appropriate /designed for attainment of PLOs.	**(D2)**
		Partially supportive.	**(W3)**
		Assessment methodologies both direct and indirect are in place but not appropriately applied.	**(C3)**
vi.	Quality of assessment process to evaluate the attainment of PLOs at student as well as cohort levels through well-defined Key Performance Indicators (KPIs); minimum threshold value should not be less than 50%	KPIs are not defined.	**(D1)**
		KPIs are not well defined or assessment is not carried out at the appropriate taxonomy; OR minimum threshold value (i.e. KPI for PLO attainment) is less than 50%	**(W2)**
		KPIs are well defined but assessment is not carried out at cohort level	**(C3)**
vii.	Process in place by which assessment results are applied to further refine the assessment mechanism and/or redefine the program outcomes, thus leading to continuous improvement of the program	CQI process for PLOs is not defined.	**(D2)**
		i) CQI process defined but not institutionalized; OR ii) No analysis carried out	**(W3)**
		Evaluation carried out but no corrective actions taken.	**(C3)**
	Criterion-3: Curriculum and Learning Process		
i.	Curriculum covers required breadth, depth and distribution of the program courses according to program specific (HEC/PEC ECRDC curriculum) guidelines.	Curriculum deviates significantly from HEC/PEC curriculum guidelines or essential breadth and depth courses are missing from the curriculum	**(D1)**
		i) The course files reveal that though the program does include the necessary Depth & Breadth courses in its curriculum, but in actual practice, the coverage of Depth contents is very shallow; OR ii) Coverage of Design aspects / projects are not adequate.	**(W2)**
		Coverage of breadth contents is not adequate.	**(C3)**
ii.	Curriculum provides balanced coverage of engineering and non-engineering contents in-line with National Engineering Qualifications Framework (NEQF) and the prescribed Knowledge Profile – WKs	Curriculum deviates significantly from NEQF;	**(D1)**
		Curriculum broadly conforms to NEQF but lacks certain important courses in more than one curricular domain (Math, Natural Sciences, Humanities, Management, Engineering), encompassing the Knowledge Profile – WK1 to WK8	**(W2)**
		Curriculum broadly conforms to NEQF but lacks certain important courses in any one curricular domain	**(C3)**
iii.	Adequate exposure to Complex Engineering Problems (CEPs) and Activities	No exposure	**(D1)**
		i) Limited exposure to CEPs in courses and labs; OR ii) Limited exposure to CEPs in FYPs.	**(W2)**

		Reasonable exposure in FYPs but not adequately covered in some courses/labs	**(C3)**
iv.	Availability of program specific well equipped labs to supplement theoretical knowledge/class room learning.	Essential Labs are missing or seriously deficient in the required lab equipment.	**(D1)**
		Most of the labs are in place, some are deficient in equipment or numbers of workstations in most of the labs are not adequate to meet student demands.	**(W3)**
		All the required labs are there, a few have limited number of workstations hindering adequate hand-on exposure	**(C3)**
v.	Lab work supporting the attainment of the required skills and its assessment mechanism	There is hardly any opportunity to develop the required skills and/or no appropriate mechanism in place to assess the skill attainment level.	**(D2)**
		The assessment mechanism lacks rigor or appropriateness (lacking Lab CLOs with Rubric based assessment mechanism)	**(W2)**
		i) One or two labs lack the focus on developing relevant skills; OR ii) Students are offered limited hands-on opportunity to develop the required skills; assessment mechanism is generally not appropriate	**(C3)**
vi.	CLOs defined for all courses with appropriate Learning-Levels, e.g. the ones defined in Bloom's Taxonomy, and their mapping to relevant PLOs	CLOs not defined for most of the breadth and depth courses.	**(D1)**
		CLOs not defined for some courses, inappropriate Taxonomy level and their mapping to relevant PLOs.	**(W3)**
		CLOs' action verbs not commensurate with taxonomy levels indicated, lacking clarity in mapping to PLOs.	**(C3)**
vii.	Formal involvement of industry in curriculum development / revision	No involvement from industry	**(D2)**
		Process in place but not regularly practiced	**(W3)**
		Informal industry involvement at departmental level.	**(C3)**
viii.	Employment of other aspects (supplementary tools and practices) of student learning such as tutorial system and seminar / workshops, etc. to enhance student learning, in addition to regular classroom interaction and lab experimentation. Regular office hours announced and time plan being maintained is the minimum expectation.	No employment of other aspects of student learning, including no regular office hours or time plan	**(D2)**
		Formal mechanism is there but not practiced.	**(W3)**
		Some other aspects of student learning are practiced.	**(OFI)**
ix.	Exposure to cooperative learning through supervised and mandatory internship program with formal feedback from the employer	No internship program in place.	**(D2)**
		Only limited Internships are arranged, no feedback mechanism is evident.	**(C3)**

		Internships are arranged, with some feedback but no analysis for CQI	**(OFI)**
x.	Sufficient opportunities to invoke intuitiveness and originality of thought through Problem Based Learning (PBL), Design Projects and Open-Ended labs.	No such opportunities exist	**(D2)**
		Few instructors practice PBL and/or give design projects in courses but not formalized by the department.	**(W3)**
		The formalized use of Design projects, Open-Ended labs and PBL is there but practiced in few breadth and depth courses	**(C3)**
xi.	Assessment of various learning outcomes (PLOs/CLOs) employing appropriate direct / indirect methods.	Inappropriate Assessment methods used for evaluation of CLOs/PLOs.	**(D2)**
		Assessment in knowledge domain usually appropriate but at times lacks rigor; OR Lacks assessment in any other domain.	**(W3)**
		Use of inappropriate rubrics for assessment of skills and attitude domains.	**(C3)**
xii.	Attainment of GAs in three domains (KSA); Summative assessment by the Graduates.	Lacking attainment of all GAs in KSA (breadth & depth and FYDP) expected by the cohort as summative assessment by the time of graduation.	**(D1)**
		Satisfactory attainment is there but a lower level expected in terms of taxonomy.	**(W2)**
xiii.	Final Year Design projects (FYDP) shall include complex engineering problems and design of systems, components or processes integrating core areas and meeting specified needs with appropriate consideration for public health and safety along with cultural, societal, and environmental considerations encompassing SDGs.	FYDPs could not be justified as an apex culmination of CEPs/CEAs and do not encompass SDGs	**(D2)**
		FYDPs are CEPs of medium taxonomy levels and somewhat encompass SDGs; OR FYDPs are mostly Review based instances with no focus on real world implementation; OR FYDPs are conducted in groups of more than 4 students; as a result, it is not possible for each student to rigorously work on his subtask and demonstrate the attainment of GAs mapped to the FYDP.	**(W2)**
xiv.	FYDP project deliverables and the reports are graded according to well-defined mechanism of rubrics and comprehensive standard operating procedures (SoPs).	FYDP project deliverables and reports are not assessed using a well-defined mechanism of rubrics and comprehensive guidelines; as a result, the quality of deliverables and reports is unsatisfactory.	**(D2)**
		FYDP has an unsatisfactory assessment mechanism of rubrics for project deliverables and reports; as a result, it is not possible to cross examine the evidence about the attainment of GAs mapped to FYDP and the quality of reports is only marginally acceptable.	**(W2)**
		FYDP has an assessment mechanism of rubrics and SoPs for project deliverables and reports; yet the evidence of attainment of GAs mapped to FYDP is not available and the quality of reports is not satisfactory and requires further rigorous proof editing by the supervisor and committee.	**(C3)**

	Criterion-4: Students		
i.	Admission Criteria meets / exceeds minimum eligibility criteria prescribed by PEC Regulations.	Not in compliance with PEC regulations, necessitating imposition of Article-8 of PEC Regulations for Engineering Education	**(W2)**
ii.	Annual intake is in-line with the maximum intake allowed by EAB for the program.	Not in compliance with PEC regulations, necessitating imposition of Article-8 of PEC Regulations for Engineering Education	**(W2)**
iii.	Well documented policy on transfer of students only from other accredited program restricting transfer of less than 50% of Cr Hrs required for the degree.	Students transferred from non-accredited programs; or student transfer allowed from accredited program but with more than 50% Cr. Hrs. transferred, necessitating imposition of Article-8 of PEC Regulations for Engineering Education	**(W2)**
		No documented transfer policy	**(W3)**
		Policy in place but not strictly adhered to.	**(C3)**
iv.	Availability of designated student counselors to advise / counsel students regarding academic / career matters and provide assistance in managing their health, financial, stress, emotional and spiritual problems.	Limited provision available but hardly practiced for academic and career counseling of students.	**(W3)**
		Student counseling available but limited to academic matters.	**(C3)**
		Student counseling effective in limited areas.	**(OFI)**
v.	Manageable class-size (around 40-50 for theory classes) and lab groups (2-3 students per workstation for hands-on type experiments, larger groups may be manageable for demonstration type)	Unmanageable class size / lab groups.	**(W2)**
		Poorly manageable class size /lab groups.	**(W3)**
		Manageable class size/lab size but exceeding desired limits	**(C3)**
vi.	Manageable semester academic load (i.e. 15-18 Cr. Hrs on the average)	Unmanageable semester academic load.	**(W2)**
		Poorly manageable semester academic load	**(W3)**
		manageable semester academic load but exceeding desired limits	**(C3)**
vii.	Completion of courses as evident from course-files and through student feedback	Course completion in majority of courses is less than 90%	**(D1)**
viii.	Students' participation in national / international engineering exhibitions and / or competitions, and facilitation by program for such participations	Hardly any participation in any event.	**(W3)**
		Limited participation	**(C3)**
		Participation in national events but not in international events	**(OFI)**
ix.	Quality of process to evaluate student performance and suggest / take corrective measures	No process is in place.	**(D2)**
		Process outlined but never followed.	**(W3)**

		Assessment is carried out but limited corrective actions are taken	**(C3)**
x.	How the program is inculcating community services	No such provision exists; OR No contact hour(s) arranged/ practiced.	**(W2)**
		Informal mechanism requiring community service exists.	**(C3)**
	Criterion-5: Faculty and Support Staff		
i.	Sufficient Faculty Strength for providing effective student-teacher interaction (student-teacher ratio should be as per PEC guidelines, i.e. better than 20:1)	Student-Teacher ratio 25+:1	**(D2)**
		Student-Teacher ratio 20-25:1	**(W2)**
ii.	Balanced faculty having appropriate qualifications (min. postgraduate with a reasonable percentage holding PhD) to cover all areas of program curriculum	Less than 02 Ph.D per intake section.	**(D2)**
		Insufficient faculty in core areas of the program	**(W2)**
		Insufficient faculty in any one core area of the program	**(C3)**
iii.	Formal mechanism for faculty training and mentoring on pedagogical skills including OBE concepts and implementation methodologies.	Limited formal training but not organized by HEI	**(W3)**
		Formal training but not covering all areas.	**(C4)**
iv.	Effectiveness of faculty development program to ensure their professional growth and retention.	No faculty development program	**(D3)**
		Limited faculty development program	**(C3)**
		FDP is in place but not effective for faculty retention/ growth	**(OFI)**
v.	Reasonable faculty workload (as per PEC guidelines) including facilitation to young faculty pursuing higher studies.	Unmanageable faculty workload	**(W2)**
		Faculty Workload though manageable but higher than the prescribed range (As defined in the PEC/HEC guidelines) on the average	**(C3)**
		Faculty workload is balanced but no facilitation to young faculty for pursuing higher studies.	**(OFI)**
vi.	Course files maintained as per PEC Manual of Accreditation 2019 – Third Edition (Amended Ver. of Accreditation Manual - 2014) guidelines	Course files are not maintained for majority of courses	**(D1)**
		Course files though maintained but lack essential information, analysis regarding completion of contents and attainment of learning outcomes (GAs)	**(W2)**
vii.	Continuation of faculty research, publications and sponsored projects from industry/donor agencies, etc.	No faculty research/ publications/ sponsored project in recent years	**(D2)**
		Limited faculty research/publications/ sponsored project in recent years	**(W3)**
		No funding from external donor agencies/industry	**(OFI)**

viii.	The program should be headed by a PhD senior faculty of relevant engineering discipline. Reasonable mix of Senior and Junior qualified faculty be ensured.	Program is not headed by a senior PhD of relevant engineering discipline.	**(D2)**
		The program is headed by an inexperienced PhD faculty or not from the relevant engineering discipline.	**(W3)**
		Majority of the faculty is young and inexperienced	**(C3)**
	Criterion-6: Facilities and Infrastructure		
i.	Adequacy of teaching and learning facilities, e.g. classroom environment and availability of various teaching aids, etc.	Essential infrastructural facilities is very limited in relation to the student population	**(D2)**
		i) Infrastructural facilities are reasonable, but not adequately maintained; OR ii) Most of the facilities are adequate but some have capacity/adequacy issues; OR iii) There is very limited availability of teaching aids in the classrooms / laboratories; OR iv) Teaching learning environment is not very conducive.	**(W3)**
ii.	Provision of program specific labs (as per curriculum), workshops, and associated lab equipment for complementing the class / theory work.	i) The program does not have all core labs required for the program, though labs are being conducted through some arrangements; OR ii) The labs are inadequate in terms of availability of essential laboratory equipment.	**(D2)**
		Fewer number of workstations/ equipment in the labs, thus hindering sufficient hands-on opportunity to the students;	**(W3)**
		i) Non-functional and/or very old equipment of limited use; OR ii) Generally congested lab spaces. OR iii) Most of the Labs being overly committed with very few free slots available for students to make up for their missed lab sessions/experiments or to work on their own projects, space inadequate	**(C3)**
iii.	Adequacy of library resources and facilities.	i) Insufficient library resources and facilities (in terms of space, seating capacity, number of books, digital library, e-books/ journals etc.) with regard to the overall university population, unless complemented by a reasonably sized departmental library for the program students; OR ii) No or very limited access to program related research Journals (hardcopy/online) and very limited and out of date program related as well as general books	**(W2)**
		i) Congested Library Space with inadequate seating capacity; OR ii) No or very limited printing/copying facility; OR iii) No internet connectivity and/or No computers for online access; OR iv) No Digital Library and e-books; OR v) Too few program specific technical books	**(W3)**

		and/ Journals.	
		i) Too few computers and/or very slow internet connectivity. OR ii) Limited number and variety of latest Reference/ Text books (i.e. published in last 5 years) for the program.	**(C3)**
iv.	Provision of sufficient computing facilities and internet access / resources allocated for the program.	Rare computing facilities and no internet access for faculty / students	**(D2)**
		Limited computing and internet access	**(W2)**
v.	Provision and effectiveness of consulting and career placement services provided to the students	Does not exist	**(D3)**
		Exist but with very limited scope and resources.	**(C3)**
		Available but not efficient, rare contribution	**(C4)**
vi.	Adequacy of support facilities such as hostels, sports and recreational centers, health care centers, student centers, and transport facilities	No concept/existence of any support facilities; neither is there any plan for acquiring these.	**(D2)**
		Inadequate facilities; planned for future but not yet approved.	**(W3)**
		Support facilities are available, some adequate and some inadequate; however, their provision / extension is planned and approved.	**(OFI)**
vii.	Adequacy of arrangements made / measures taken to ensure work-place safety (EHS concerns) in general, and while performing experiments in the labs. in particular	No awareness about safety, Highly unsafe environment, Not even basic fire-fighting equipment and/or emergency exits.	**(D1)**
		i) Conscious about workplace safety and several safety measures in place. However, no formal policy/procedures for EHS documented; ii) Inadequate safety measures inside / around laboratories.	**(W2)**
		i) EHS concept/SOPs exist but occasionally / limited practiced. (No evidence) ii) Safety measures available in labs but needs improvement and proper maintenance.	**(C3)**
	Criterion-7: Institutional Support and Financial Resources		
i.	Adequacy of institutional financial resources to ensure program's sustainability and meeting of recurring as well as developmental requirements.	Unsustainable Institutional financial resources	**(D2)**
		Hardly meeting recurring budgetary expenses AND NO / barely minimal developmental budgetary allocations / roadmap	**(W2)**

		Adequacy of financial resources for the recurring expense But Developmental budget for the program is not adequate / allocated	**(C3)**
ii.	Evidence of continued financial commitment in the form of increasing endowment and recurring /development budget since last accreditation visit.	i) Financial health in terms of Endowment fund, investments, etc. has gone down as compared to that at the time of last accreditation visit; OR ii) Inadequate recurring/ development budget.	**(W2)**
iii.	Provision of funding for R&D pursuits and presentations/publication of research papers	No provision of funding for UG projects	**(D2)**
		Inadequate Funding, and that too mostly not utilized because of no motivations / encouragement for Publications and Research projects	**(W3)**
		Some funding for R&D pursuits and publications (in the last 2-3 years)	**(OFI)**
	Criterion-8: Continuous Quality Improvement (CQI)		
i.	CQI process is well documented and institutionalized at all levels (CLOs, PLOs and PEOs) through institute's QMS.	CQI process / mechanism is not in place	**(D1)**
		CQI is defined and institutionalized but not practiced.	**(W2)**
		CQI is well documented, institutionalized and practiced at all levels, but some of the corrective actions are not taken.	**(C3)**
ii.	Actions taken / implementation plans worked out to address the concerns/weaknesses identified in the last accreditation visit report.	No actions are taken and no implementation plans are evident.	**(D2)**
		Only partial actions are taken and/or implementation plans are unsatisfactory.	**(W3)**
iii.	Improvement in Faculty Strength / Qualifications since last accreditation visit, if required.	Insufficient improvement in Faculty Strength/Qualifications.	**(D2)**
		Partial improvement in Faculty Strength/Qualifications since last accreditation visit.	**(W3)**
iv.	Improvement in Student-Teacher Ratio since last accreditation visit, if required.	Insufficient improvement in Student Teacher Ratio (current ratio is higher than 25:1)	**(W2)**
		Partial improvement in Student-Teacher Ratio since last accreditation visit.	**(W3)**
v.	Continuation of Faculty Publications, R&D and Consultancy activities	No publications / R&D /Consultancy projects since last visit	**(D2)**
		Limited research publications / R&D / consultancy activities.	**(W3)**
		Lack of Journal publications and /or funded R&D / consultancy activities.	**(C4)**
vi.	Addition of any new facilities, i.e. infrastructure, lab equipment, teaching aids, etc. to assist in the attainment of program objectives / outcomes, since last accreditation visit	No addition of new facilities.	**(W3)**
		Limited addition of new facilities.	**(C4)**

vii.	New initiative(s) taken since last accreditation visit (including but not limited to OBE implementation, content delivery, assessment and evaluation processes, etc.)	No new initiatives taken.	**(W3)**
		No significant new initiatives taken.	**(C3)**
	Criterion-9: Industrial and International Linkages		
i.	Existence of active Industrial Advisory Board/Committee	No Industrial Advisory Board exists.	**(D2)**
		Industrial Advisory Board exists but is inactive.	**(W3)**
		Meets irregularly.	**(C4)**
ii.	Formal mechanism for seeking feedback from Industry and its analysis for the attainment of PEOs	No formal mechanism in place.	**(D2)**
		The formal mechanism is in place but the assessment tools / methods do not correlate with the PEOs.	**(W3)**
		The formal mechanism exists and its assessment tools / methods also correlates with the PEOs; however, effective analysis not periodically performed.	**(C4)**
iii.	Opportunities for students to acquire industrial experience via internship and existence of Industry-Liaison office	No dedicated Industry-Liaison office exists.	**(D3)**
		A dedicated Industry-Liaison office exists, but plays no role in arranging internships.	**(W3)**
		A dedicated Industry-Liaison office exists, but its effectiveness is limited.	**(C4)**
iv.	Design projects sponsored / supervised jointly by Industry Professionals and faculty members	No sponsored design projects and no joint supervision.	**(D3)**
		No sponsored design projects but limited joint supervision.	**(C4)**
		Industrial linkages exist but limited sponsored design projects.	**(OFI)**
v.	Faculty members involved in design / supervision / consultancy role with the industry in the execution of applied research / design project that are relevant to society / industry.	No policy exists or no faculty involvement with industry on applied research / design project.	**(D2)**
		Limited faculty involvement with industry on applied research / design project.	**(C4)**