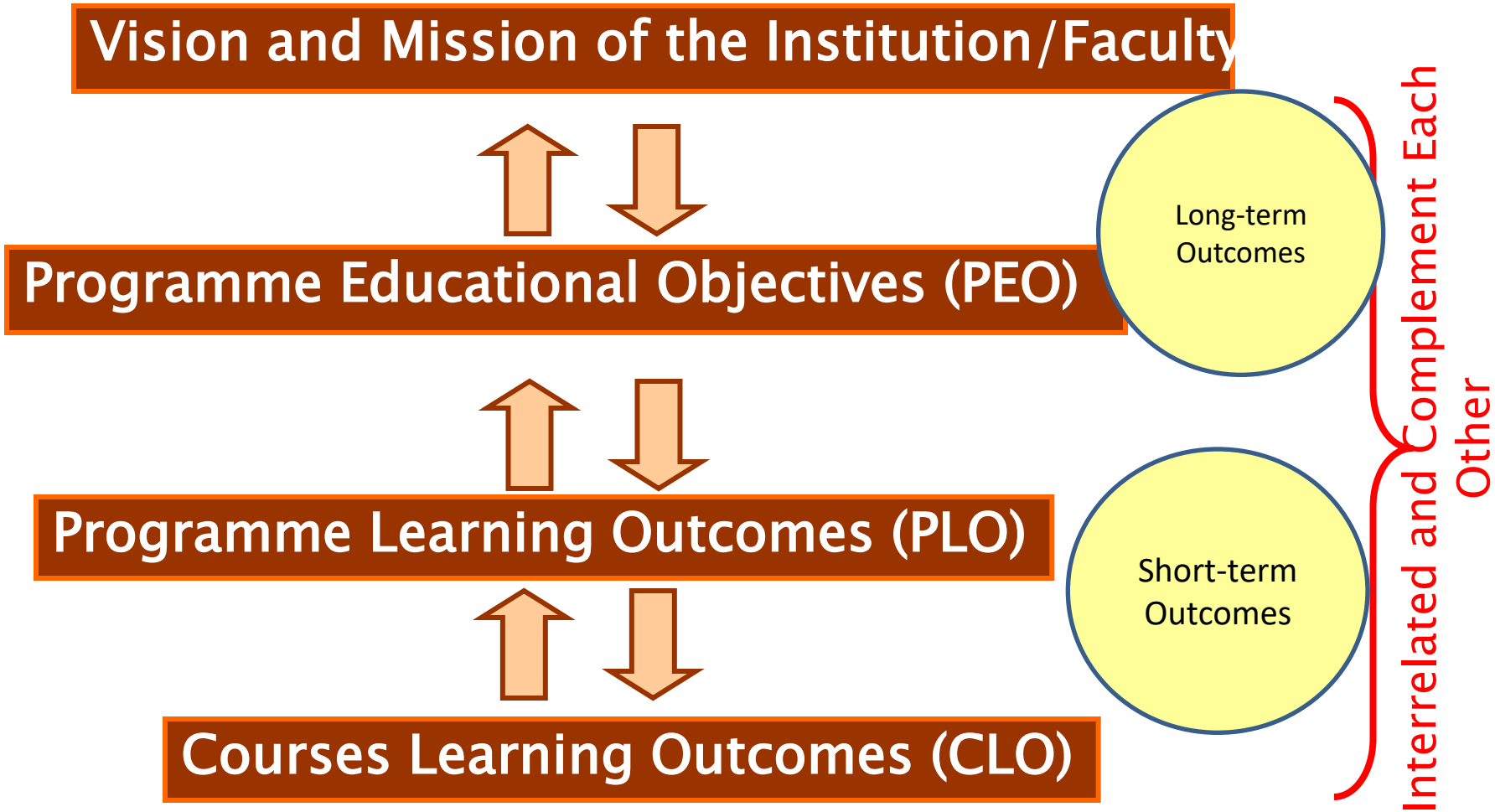

بسم الله الرحمن الرحيم

OUTCOME BASED EDUCATION/EVALUATION
Way Forward

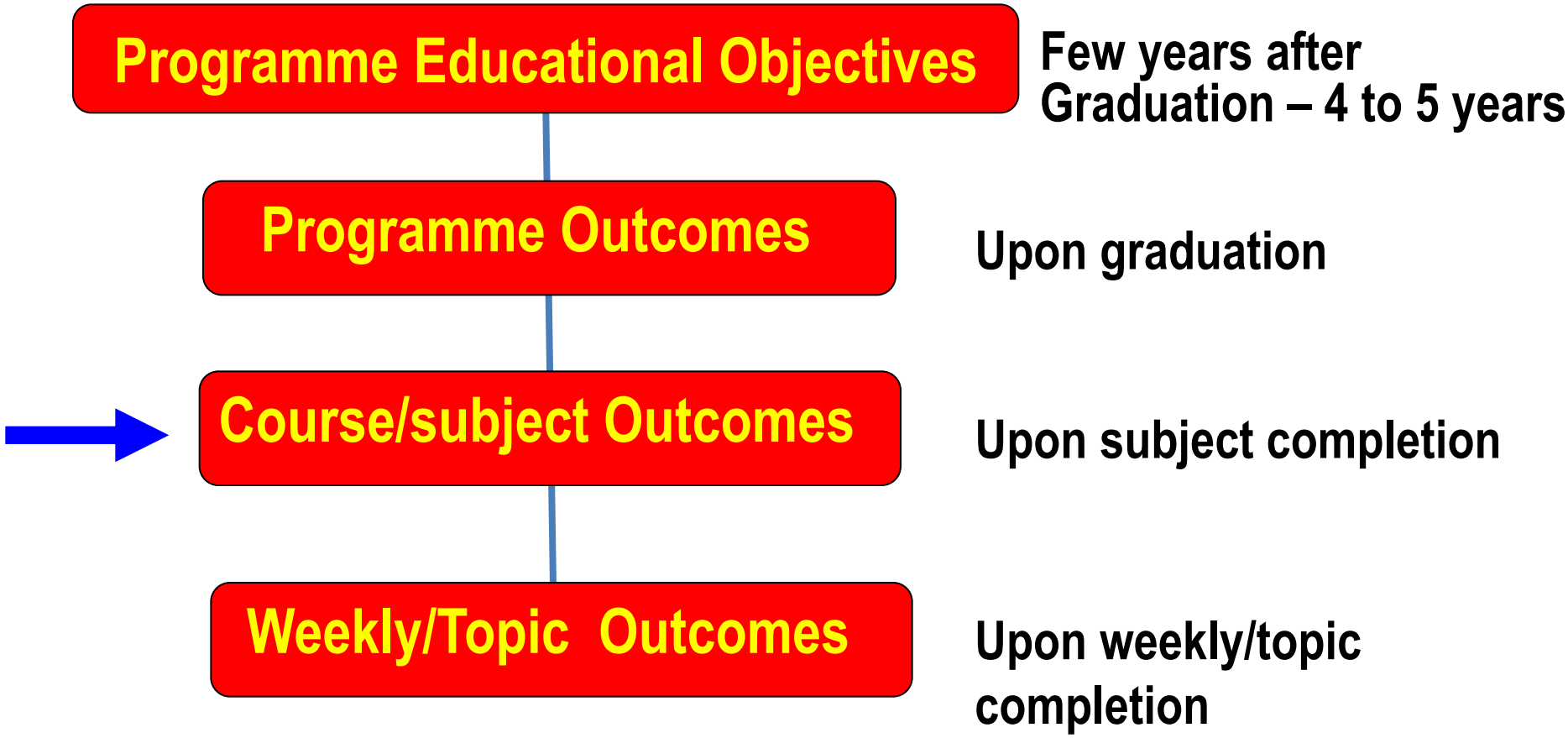


Outcomes in OBE

A Model Hierarchy of Outcomes



Different Levels of Outcomes



Program Learning Outcomes (PLOs) Specified under Washington Accord for Engineering, equally applicable to other fields.

- **12 Program Learning Outcomes for Engineering Programs as defined by Engineering Accreditation Council (EAC) under Washington Accord**
- **At the completion of the degree program, students are expected to demonstrate reasonable expertise in these outcomes**

- **WA-1: Knowledge** **WA-2: Problem Analysis**
- **WA-3:Design Development** **WA-4: Investigation**
- **WA-5: Use of Modern Tools** **WA-6: Engineering and Society**
- **WA-7: Environment and Sustainability**
- **WA-8: Ethics** **WA-9: Communication**
- **WA-10: Individual and Teamwork**
- **WA-11: Life Long Learning**
- **WA12: Project Management and Finance**
  - **Other departments can define their own outcome in teams**

(i) Knowledge of Engineering ~~Sciences~~

Differentiation Characteristic	WA
Breadth and depth of education and type of knowledge, both Theoretical and Practical	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems (***conceptualization of engineering models***)

(ii) Problem Analysis

Differentiation Characteristic	WA
Complexity of analysis	Identify, formulate, research literature and analyse (*solve) complex engineering problems* reaching substantiated conclusions *using first principles* of mathematics, natural sciences and engineering sciences.

(iii) Design/ development of solutions

Differentiation Characteristic	WA
Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified	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.

(iv) Investigation

Differentiation Characteristic	WA
Breadth and depth of investigation and experimentation	Conduct investigations (of) *into complex 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.

(v) Modern Tool Usage

Differentiating Characteristic: Level of Understanding of the Appropriateness of the Tool

WA
Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations

(vi) The Engineer and Society

Differentiation Characteristic	WA
Level of knowledge and responsibility	Apply reasoning informed by contextual knowledge to assess (Demonstrate understanding of the) societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

(vii) Environment and Sustainability

Differentiation Characteristic	WA
No differentiation in this characteristic	Understand the impact of professional engineering solutions in a societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

(viii) Ethics

Engineer – **Washington Accord**
Apply ethical principles (Understand) **and commit** **to professional ethics, responsibilities, and norms of engineering practice**

(ix) Communication

Differentiation Characteristic	WA
Level of communication according to type of activities performed	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.

(x) Individual and Teamwork

Differentiation Characteristic	WA
Role in and diversity of team	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

(xi) Life long learning

Differentiation Characteristic	WA
No differentiation in this characteristic	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

(xii) Project Management and Finance

Differentiation Characteristic	WA
Level of management required for differing types of activity	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments (business practices, such as risk and change management, and understand their limitations.)

WA-1 Knowledge

- **It is to be demonstrated that the students have acquired the following graduate attributes:**
- **WA-1: Engineering Knowledge:** An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
  - **Non Engineering Courses**
    - Social Science and Humanities
    - Humanities
    - Management Sciences
    - Natural Sciences
  - **Engineering Courses**
    - Engineering Computing - Engineering Foundation
    - Major Based Core (Breadth) - Major Based Core (Depth)
    - Inter-Disciplinary Engineering - Breadth (Electives)
    - Engineering Project - Industrial Training/Internship
  - **PEC/HEC latest curricula 2012-13**
  - **Course review committees at departmental levels.**
  - **Regular Industry Feedback to assess the effectiveness of Education**

WA-2 Problem Analysis

An ability to identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

- Regular discussions on research findings
- Research based thinking in students and faculty
- Innovative problems for individual students
- Case studies
- Real Life Engineering problems
- Class Based Assignments

WA-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.

- Real Life problem and issues and their solutions
- Discussion of designs and solutions already employed
- To explain the basic principles and procedures required for design development
- Case studies to explain the societal value , health & safety and environmental considerations related to various problems and their solutions

WA-4 Investigation:

An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments

- To provide the requisite knowledge before conducting experiments
- To correlate the experiments with the background knowledge
- To involve the students in the performance of practical
- The students may be involved in the survey of published papers and other information relating to the topic and issues

WA-5 Modern Tool Usage

- Modeling, to complex engineering activities, with an understanding of the limitations.

- An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction.
  - Use of various modeling techniques
  - Application software (Analysis, Design, Reporting)
  - IT application in Engineering problems
  - A strong IT and Software group for interdisciplinary work

WA-6: The Engineer and Society

- An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.
  - Background of Codes of Professional practice
  - Case studies
  - The life stories of renowned Engineers and their contribution to the society for the human health and safety

WA-7 Environment and Sustainability:

An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

- **Resource Conservation**
  - Water Conservation
  - Energy Conservation
  - Material Conservation
- **Life Cycle Costing**
  - Design phase,
  - Operation phase
  - Maintenance Phase
- **Humane Design**
  - Environmental friendly (Global warming, Ozone layers depletion etc)
  - Culturally acceptable

WA-8: Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

- Code of Ethics
- Teaching of Engineering Ethics
- Ethical dilemmas and their consequences

WA- 9: Individual and Team Work

An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.

- Team building training
- Team works assignments
- Class team based assignments
- Team based/group based informal sessions by students at cafeteria
- Multi- disciplinary teams of students and faculty

WA-10: Communication

: An ability to communicate effectively, orally as well as in writing, 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.

- Effective faculty and students interaction
- Students communication skills (Verbal and Non Verbal)
- Technical Report writing skills

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WA-11 Project Management

An ability to demonstrate management skills and apply engineering principles to one's own work, as a member and/or leader in a team, to manage projects in a multidisciplinary environment.

- Concept of project and Project Life Cycle
- Term/Semester Projects
- Independent Study and project
- Project Based thinking

WA-12: Lifelong Learning:

An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

- Extensive Capacity Building Programme
  - **Speaker at the Campus series**
  - **Young Faculty Lecture Series**
  - **Professional Engineering Body**
- Faculty membership of various Societies
- Research publications etc.

PART-2: Example of Civil Engineering Program

CUSIT VISION-Being Redefined to be aligned with OBE

City University will emerge as one of the leading universities that generate, propagate and disseminate Knowledge in cutting edge Sciences, Engineering & Technologies and Social Sciences & Humanities to provide solutions to the contemporary problems and directions for the future.

CUSIT MISSION

1. ***To deliver quality academic programs in Sciences, Technologies, Social Sciences and Humanities, based on state-of-the-art Knowledge, Skills, Attitude and R&D.***
2. ***To attract and nurture quality minds (Students and Faculty of high caliber) who will contribute towards the national and global knowledge economy for the socio-economic development***
3. ***To develop and nurture strong research culture & climate within a dynamic, efficient and effective team of academic and support staff***
4. ***To be financially self-sustaining through high quality education, cutting edge research, national and international collaboration and commercialization of R&D products and services. ……***

Vision and Mission of CED

- **Vision and Mission of Department (To be provided by Department's HoD/QEC)**

Vision and Mission of Civil Engineering Department

Vision to provide Sate-of-the-Art education in Civil Engineering that enables new generation of Civil Engineers to meet the challenges of the future, promote a sense of scholarship, leadership and service to the mankind through creativity and innovations.

- ***The mission of the CE department can be summarized as***

1. ***To provide the students with high-quality education and training required to fully develop their professional qualities and skills as civil engineers.***

2. To develop their personal potential to the greatest extent possible to be able to pursue higher studies and research.

3. To enable them to do research to serve the people and society of KP and Pakistan for their socio-economic development

4. Develop University Consultancy group in diversified Civil Engineering fields for economically sustainable and socially acceptable CE program

Mapping CUSIT and CED Visions

City University Mission	CED Mission
1. *To deliver quality academic programs in Sciences, Technologies, Social Sciences and Humanities, based on state-of-the-art Knowledge, Skills, Attitude and R&D.*	1. *To provide the students with high-quality education and training required to fully develop their professional qualities and skills as civil engineers.* 2. *To develop their personal potential to the greatest extent possible to be able to pursue higher studies.*
2. *To attract and nurture quality minds (Students and Faculty of high caliber) who will contribute towards the national and global knowledge economy for the socio-economic development*	3. *To enable them to do research to serve the people and society of KP and Pakistan* *To enable them to do research to serve the people and society of KP and Pakistan*
3. *To develop and nurture strong research culture & climate within a dynamic, efficient and effective team of academic and support staff*	
4. *To be financially self-sustaining through high quality education, cutting edge research, national and international collaboration and commercialization of R&D products and services. .....*	*4. Develop University Consultancy group in diversified Civil Engineering fields for economically sustainable and socially acceptable CE program*

(To be provided by Department HoD)

- **Mapping of Department Mission and University Mission**

CED Mission	University's Mission			
	1	2	3	4
1	√			
2	√	√		
3		√	√	
4				√

CE-Program Educational Outcomes- PEOs

Program Educational Outcomes/PEO of Civil Engineering Program: The graduates of Civil Engineering Program after 4-5 years of graduation will:

- **PEO1**: **Successfully practice Civil Engineering** at the highest professional levels to serve national, and international industries and government agencies;

- **PEO2:** Have the necessary **background and technical skills to work professionally in one or more of the areas** of environmental engineering, geotechnical engineering, structural engineering, transportation engineering, water resources engineering and other related fields;

- **PEO3:** Be prepared and **commitment to their ethical and social responsibilities** to work for the safety of society, both as individuals and in team environments;

- **PEO4: Be motivated for, and capable of pursing continued life-long learning** through further graduate education, or other training programs in engineering or related fields.

Mapping of CUSIT Mission and CED mission

CUSIT MISSION

1. To deliver quality academic programs in… based on Stat of the art Knowledge Attitude and R&D.

2. To attract and nurture quality minds and contribute towards the national and global knowledge economy for the socio-economic development

3.To develop and nurture strong research, culture & climate within a dynamic, efficient and effective team of academic and support staff

4.To be financially self-sustaining ….. and commercialization of R&D products and services. ……

1. ***To provide the students with high-quality education and training required to fully develop their professional qualities and skills as civil engineers.***

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4. Develop University Consultancy group in diversified Civil Engineering fields for economically sustainable and socially acceptable CE program

Mapping of CUSIT Vision and CED PEOs

PEOs (CED)	CUSIT MISSION			
	1	2	3	4
1	√			
2			√	
3		√		
4				√

Attributes of Good PEOs for Assessment by Councils

1. **Well defined and Publicized:**

   Given at the department website and Prospectus (HoD/MIS/Adm)

2. **Dully approved by Statutory Bodies** (BOS/BOF/AC

3. **PEOs are defined and consistent Vision and Mission and well publicized** –mapping of PEOs with Vision and Mission(HoD) and given at website (MIS) and prospectus (Admission office)

4. **Involvement of stakeholders** (Faculty, External Stakeholders, employers etc.)- BoS/BoF to be represented with industry and employers reps on regular basis with their feedback system in curriculum review

5. **Process to evaluate attainment of PEOs** (Employers and Alumni Survey) after graduation of students)

6. **Evaluation of results for continual Improvement** (Depatment QEC and University QEC)

Key Performance Indicators (KPIs)

PEO	Expected Graduate Attribute
1	-**Successfully practice Civil Engineering** at the highest professional levels to serve national, and international industries and government agencies;

S No	KPI	Measurement Tool
1	More than 60 % of graduates are employed	Alumni Survey
2	At least 70 % of the sampled employers are satisfied with knowledge , skills and Attitudes of employed graduates	Employer Survey
3	At least 70% of graduates give positive feedback on knowledge, skills and attitude imparted	Alumni Survey

Key Performance Indicators (KPIs)

PEO	Expected Graduate Attribute
2	Have the necessary **background and technical skills to work professionally in one or more of the areas** of environmental engineering, geotechnical engineering, structural engineering, transportation engineering, water resources engineering and other related fields;

S No	KPI	Measurement Tool
1	At least 60% of graduates are employed at the core areas of Civil Engineering	Employer Survey
2	At least 60% of respondent employers are satisfied with the technical and professional skills of the employed graduates	Employer Survey

Key Performance Indicators (KPIs)

PEO	Expected Graduate Attribute
3	Be prepared and **commitment to their ethical and social responsibilities** to work for the safety of society, both as individuals and in team environments;

S No	KPI	Measurement Tool
1	At least 60% respondent employers are satisfied with adherence to ethical values and social responsibilities by employed graduates.	Employer Survey
2	At least 60% of respondent employers are satisfied with the discharge of professional obligations of employed graduates.	Employer Survey

Key Performance Indicators (KPIs)

PEO	Expected Graduate Attribute
4	**Be motivated for, and capable of pursing continued life-long learning** through further graduate education, or other training programs in engineering or related fields.

S No	KPI	Measurement Tool
1	At least 50% of the respondent graduates are pursuing higher education or involved in professional development activities.	Alumni Survey
2	More than 80% of respondent graduates should have acquired membership of professional engineering bodies, including 95-100% registration with PEC .	Alumni Survey

Mapping PLOs to PEOs

Program Educational Objectives (PEOs)	
PEO1	Be knowledgeable and competent, capable of providing innovative and comprehensive solutions to meet the industry needs.
PEO2	Have effective communication and managerial skills imbibed with teamwork abilities.
PEO3	Demonstrate spirit of professionalism with high moral and ethical values.
PEO4	Possess cognitive skills and life-long learning attributes.

Program Learning Outcomes (PLOs)	
PLO1	Engineering Knowledge
PLO2	Problem Analysis
PLO3	Design of Solutions
PLO4	Investigation
PLO5	Modern Tool Usage
PLO6	The Engineer and Society
PLO7	The Environment and Sustainability
PLO8	Ethics
PLO9	Individual and Team Work
PLO10	Communication
PLO11	Project Management
PLO12	Life-Long Learning

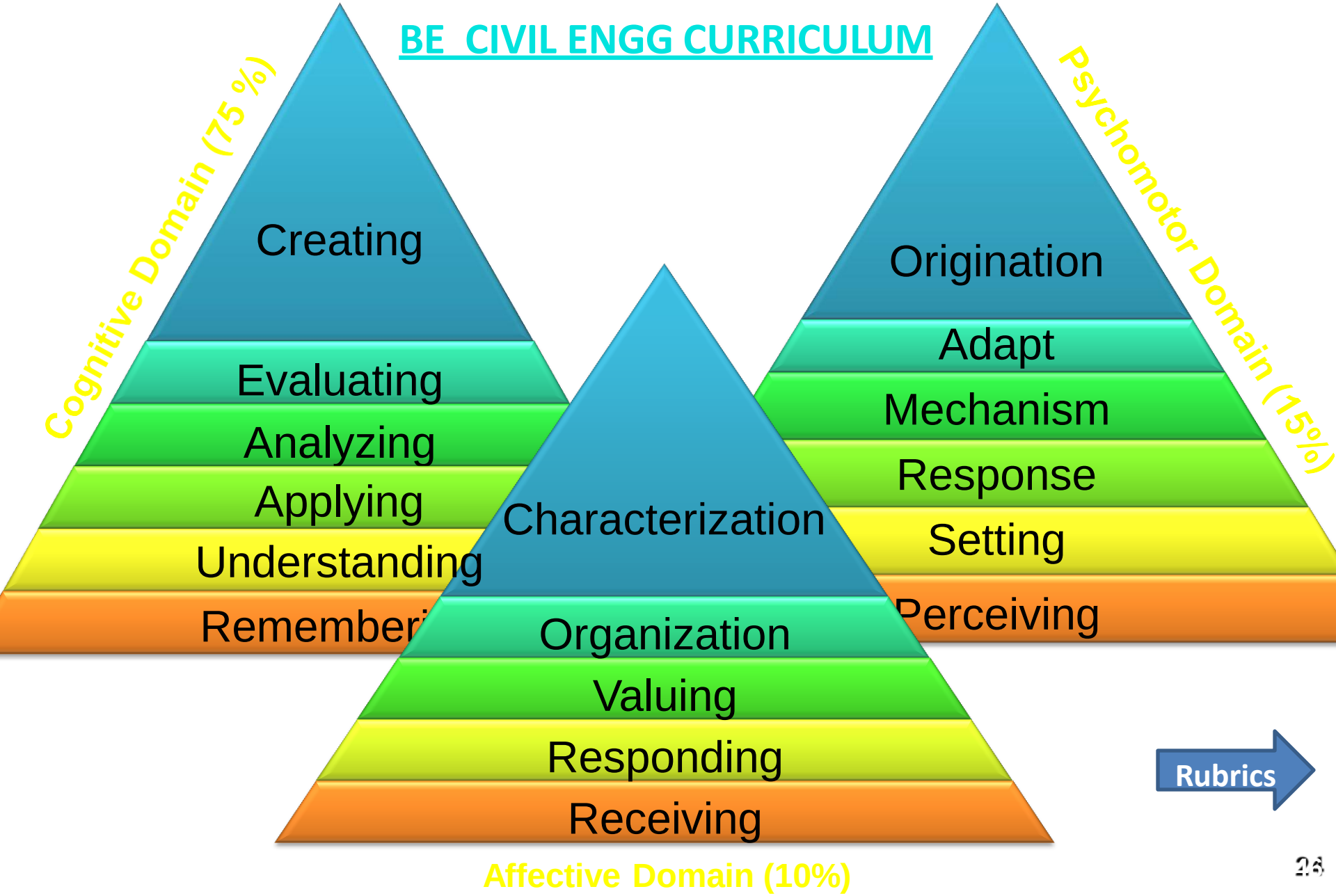
Mapping PEO vs PLOs

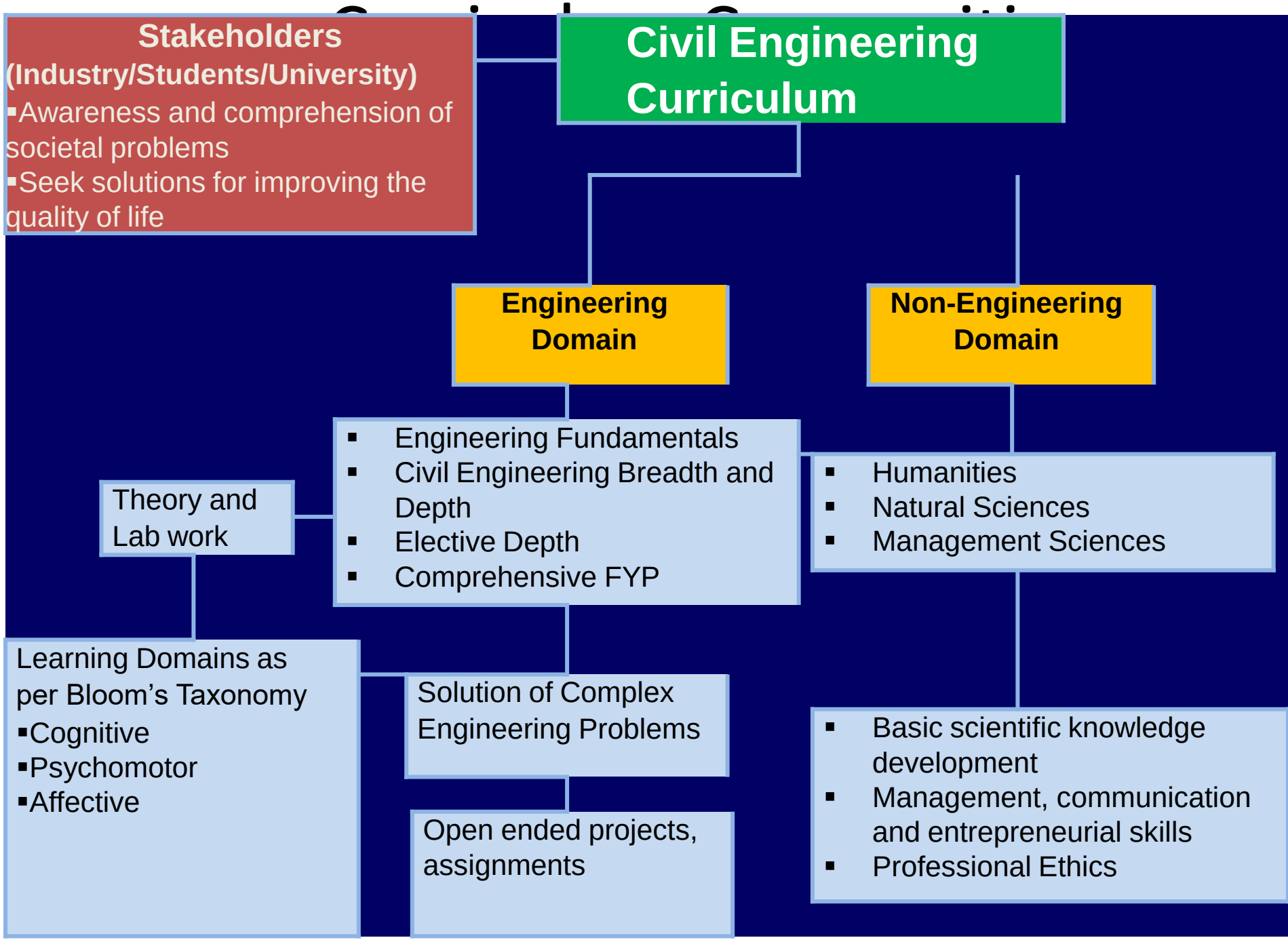
	PEO1	PEO2	PEO3	PEO4
PLO1	P			
PLO2	P			
PLO3	P			
PLO4	P			
PLO5	P			
PLO6			P	
PLO7	P			
PLO8			P	
PLO9		P		
PLO10		P		
PLO11	P			
PLO12				P

Program Educational Objectives (PEO) / Program Learning Objectives (PLO)	Knowledge PLO1	Problem Analysis PLO2	Design Development PLO3	Investigation PLO4	Modern Tools Usage PLO5	Engineer and Society PLO6	Environment and Sustainability PLO7	Ethics PLO8	Individual and Team work PLO9	Communication PLO10	Project management PLO11	Life Long Learning PLO12
PEO1: Successfully practice Civil Engineering at the highest professional levels to serve national, and international industries and government agencies;	×	×				×				×		
PEO2: Have the necessary background and technical skills to work professionally in one or more of the areas of environmental engineering, geotechnical engineering, structural engineering, transportation engineering, water resources engineering and other related fields;			×	×	×						×	
PEO3: Be prepared and commitment to their ethical and social responsibilities to work for the safety of society, both as individuals and in team environments							×	×	×			
PEO4: Be motivated for, and capable of pursing continued life-long learning through further graduate education, or other training programs in engineering or related fields.											×	×

Program Learning Domains

Learning Domains Coverage




Stakeholders
(Industry/Students/University)
▪Awareness and comprehension of societal problems
▪Seek solutions for improving the quality of life
Civil Engineering Curriculum
Engineering Domain
Non-Engineering Domain
▪ Engineering Fundamentals
▪ Civil Engineering Breadth and Depth
▪ Elective Depth
▪ Comprehensive FYP
▪ Humanities
▪ Natural Sciences
▪ Management Sciences
Theory and Lab work
Learning Domains as per Bloom's Taxonomy
▪Cognitive
▪Psychomotor
▪Affective
Solution of Complex Engineering Problems
Open ended projects, assignments
▪ Basic scientific knowledge development
▪ Management, communication and entrepreneurial skills
▪ Professional Ethics

Breakdown of BE Degree Credit Hours

PEC Requirement:

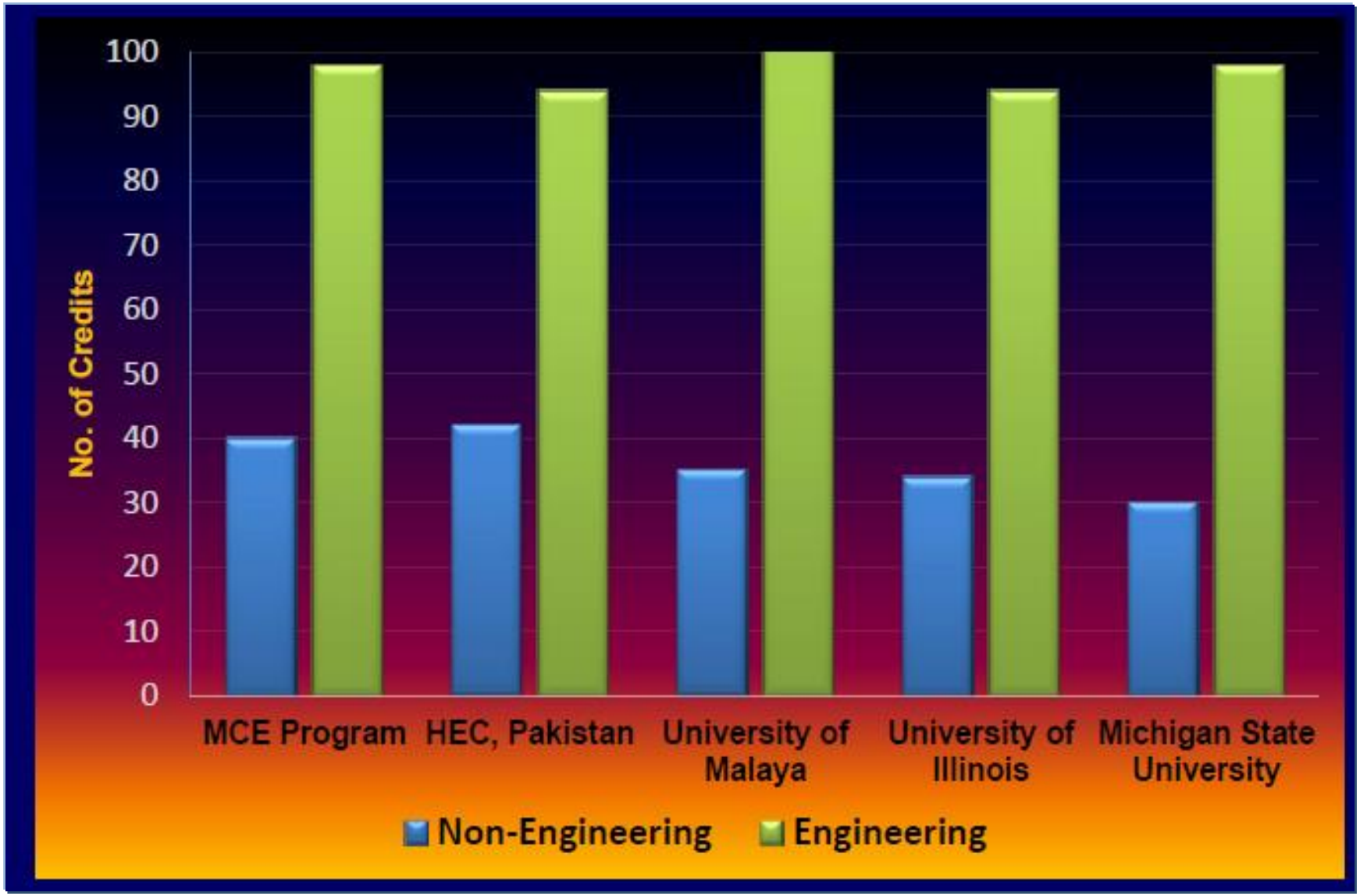
Engineering Subjects = 65-70%, Non-engineering Subjects = 30-35%

Domain	Knowledge Area	No of Courses	Total Credit Hrs	% of Total Cr Hrs
Non-Engineering	Humanities	5	10	29.20
	Management Sciences	2	5	
	Natural Sciences	9	25	
	Sub Total	16	40	
Engineering	Computing	3	6	70.80
	Engineering Foundation	9	30	
	Major Based Core (Breadth)	9	28	
	Major Based Core (Depth)	7	21	
	Inter-Disciplinary Engineering	3	6	
	Civil Engineering Project	1	6	
	Industrial Training / Internship (Summer)	-	-	
	Sub Total	32	97	
	Total	48	137	100

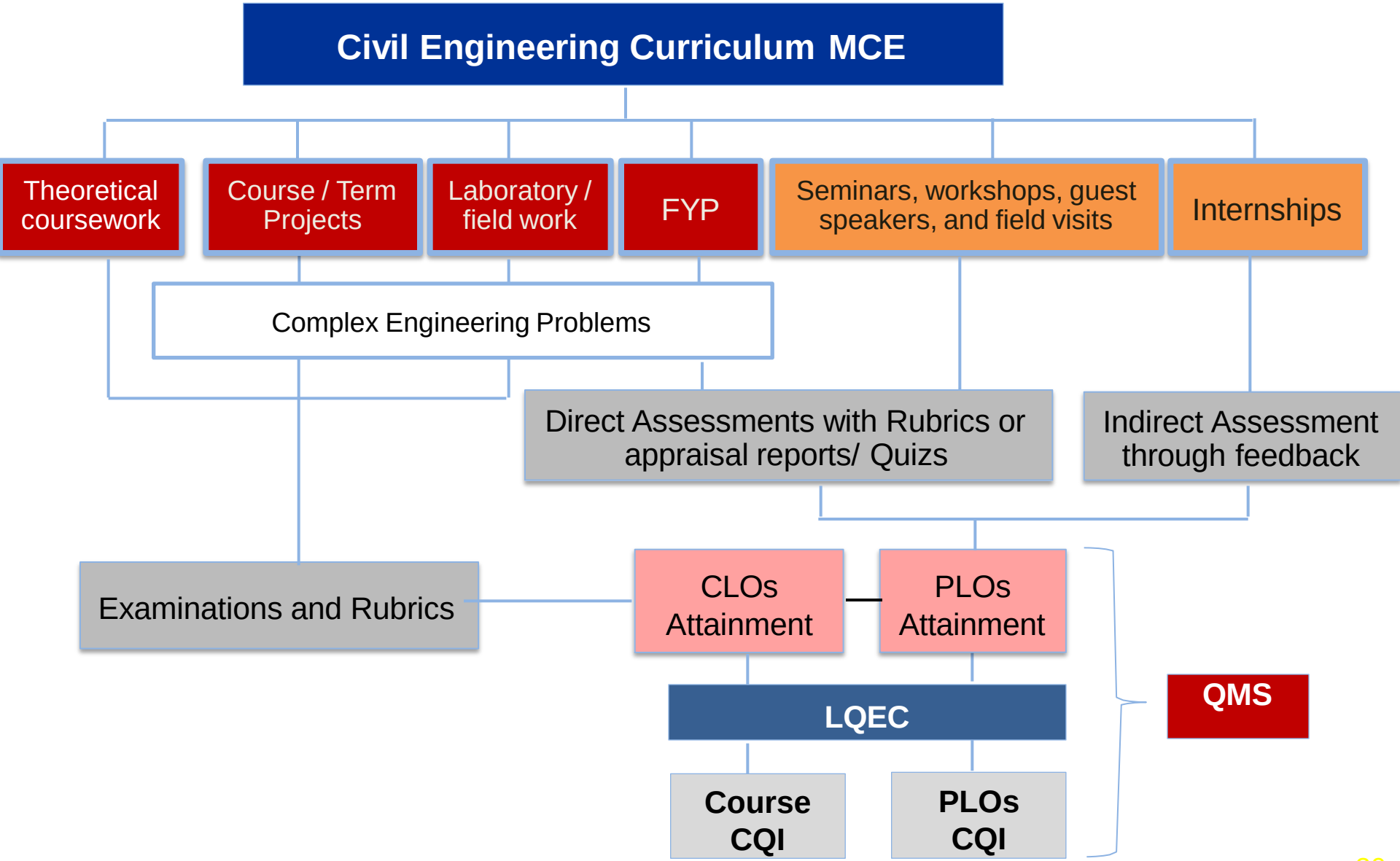
Curriculum Benchmarking

Domain	Knowledge Area	MCE's Program	National HEC Recommended	University of Malaya Malaysia	University of Illinois USA	Michigan State University USA
		Credits	Credits	Credits	Credits	Credits
Non-Engineering	Humanities	10	12	15	21	10
	Management Sciences	5	9	20	3	9
	Natural Sciences	25	21		10	11
	Sub Total	**40 (29.2%)**	**42 (31%)**	**35 (26%)**	**34 (27%)**	**30 (23%)**
Engineering	Computing	6	9	82	19	42
	Engineering Foundation	30	28		49	
	Major Based Core (Breadth)	28	20			18
	Major Based Core (Depth)	21	24		15	18
	Inter-Disciplinary Engineering (Electives)	6	7		6	9
	Civil Engineering Project (FYP)	6	6	6	5	6
	Industrial Training (Summer)	Offered in summer	0	5	0	5
	Sub Total	**97 (70.8%)**	**94 (69%)**	**102 (74%)**	**94 (73%)**	**98 (77%)**
	Total	**137**	**136**	**137**	**128**	**128**

Curriculum Benchmarking

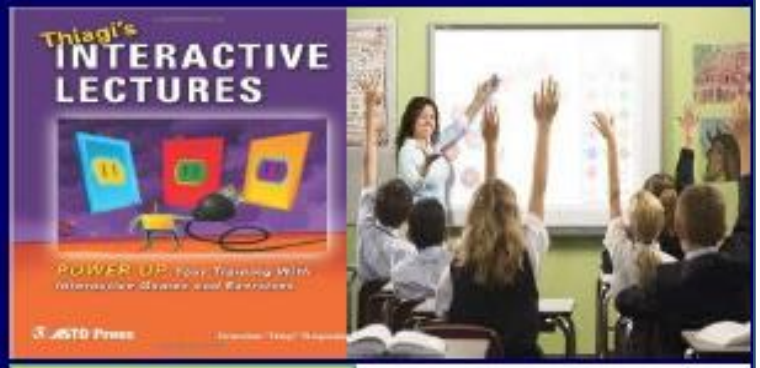


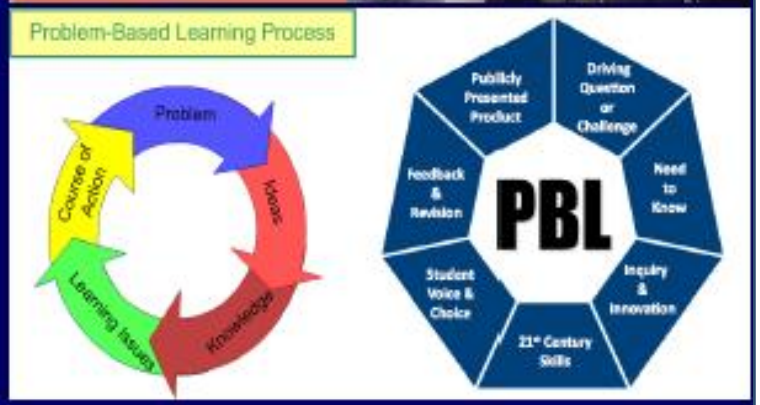
Curriculum Components



Quality of Instructions

- Interactive lectures and problem solving activities
- Problem Based Learning (PBL) activities (real world problem, higher levels of learning)
- In-Class Comprehensive Exam
- Detailed Course Folder





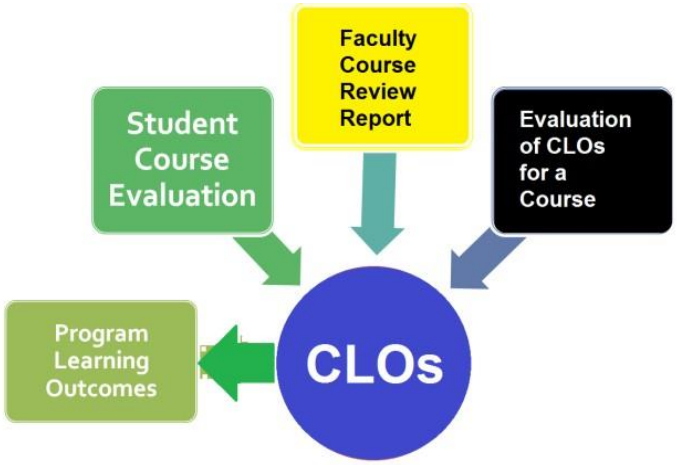
Monitoring Quality of Instructions
(Department wise and CUSIT level

- Regular visits of classes by HoDs
  - Class Audit Report of each visit
  - Discussion of Class Audit Reports with Dean / Advising faculty
- Monthly Students Academic Prefects Meeting with Dean
- Monthly Faculty Meeting
- Teaching Seminar
  - Effective Teaching & Learning in Universities
  - Teaching & Learning Focused on Outcome Based Education (2015 , 2016 & 2017)

Academia – Industry Linkage (Role Alumni/Industry Liaison)

- Proactive academia – industry linkage program in collaboration with public and private sectors
- Industrial liaison office/CU-CSR established as a subsidiary of CUSIT
- Industry Advisory Board constituted to guide and share input for curriculum development and improvement
- Laboratorytestingfacilities to be extended
- Faculty involvement in Consultancy services.

COURSE PLAN/Course Learning Outcome – Traffic Engineering



S.No	CLO	Domain	Taxonomy Level	PLO
1	**Explain** general principles and **Solve** problems related to traffic engineering and safety.	Cognitive	1, 2, 3	1
2	**Analyse** and **Investigate** practical problems related to traffic engineering and safety.	Cognitive	4, 5	2
3	**Perform** Intersection analysis using SIDRA Intersection or SYNCHRO/ SIMTRAFFIC software for signal design and analysis.	Psychomotor	3	5

MAPPING CLOs vs PLOs

Mapping CLOs vs PLOs

One Time Design Activity

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO 10	PLO 11	PLO 12
1	X											
2		X										
3					X							

CE–444
Traffic Engineering & Safety

No	CLOs
1	**Explain** general principles and **Solve** problems related to traffic engineering and safety.
2	**Analyse** and **Investigate** practical problems related to traffic engineering and safety.
3	**Perform** Intersection analysis using SIDRA Intersection or SYNCHRO/ SIMTRAFFIC software for signal design and analysis.

Progress PLAN

Contents	CLOs	Teaching Method	Assessment Method
Traffic Engineering and Basic Definitions	1	Lecture	Quiz, Assignments
Roadway Users/ Human Factors and Vehicle Characteristics	1,2	Lecture	Quiz, Assignments
Problem Solving Activity on Traffic Related Design Aspects	1,2	Practice	Quiz, Assignments
Traffic Control Devices	1	Lecture	Quiz, OHTs
Traffic Stream Characteristics/ Green Shields Equations	1,2	Lecture	Quiz, Assignments OHTs, Final, Term Project
Shock Wave Theory	1.2	Lecture	Quiz, Assignments OHTs, Final,Term Project
Applications of Shock Waves and Problem Solving Activity	1,2	Practice	

MAPPING CLOs vs PLOs

Assessment Methods and Evaluation

Quiz

PBL Activities

Home works/ Team assignments

Term Project

In-Class Comprehensive Assignment (

Mid Terms Exam(s)/OHTs

Final Exam open book exam)

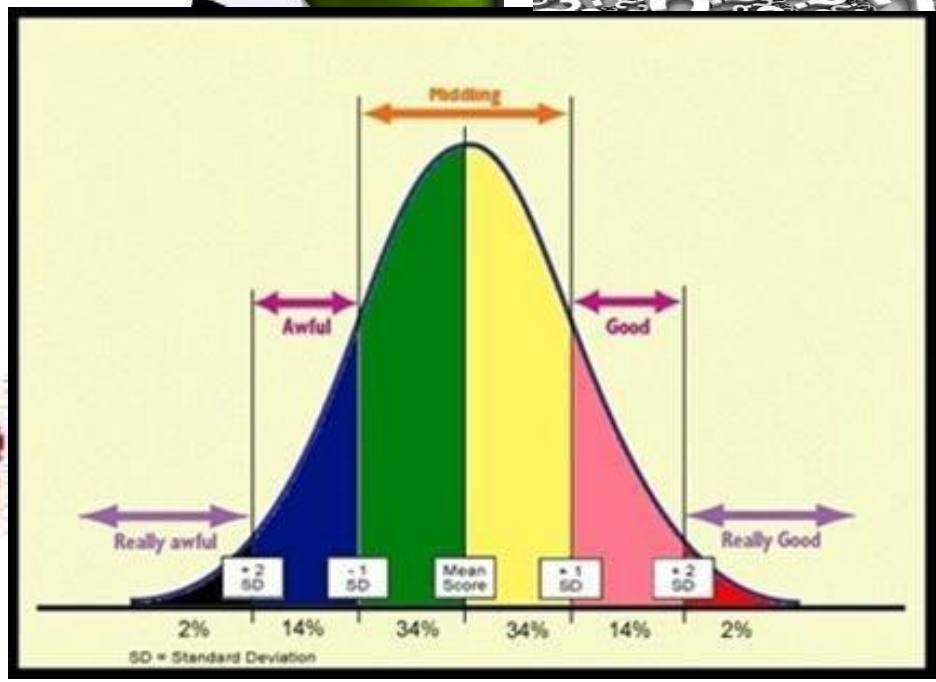
End Semester Exam (ESE)

Assessment Methods and Evaluation

SUBJECT-WISE STUDENT AWARD LIST

Grading & Examination

- Relative grading system
- Conduct of exam and invigilation
- Coding/ decoding of answer sheets
- Preparation and scrutiny of results



Grading Scheme

Naure of Exam	Duration	Frequency	Weightage (%)	
			Theory	Prac
End Semester Exam	Approx 3 hrs	1	40-50	20-30
One Hr Test	One Hr	Min 2 per subj	30-40	-
Quizzes	10-15 Mins	Min 2-5 per subj	10-15	-
Assignments	Own Time	Min 2-5 per subj	5-10	-
Practical/ Lab Work	Own Time	-	-	70-80

Learning Process

- **Course work**
- **Lab work**

Lab Report Psychomotor Evaluation

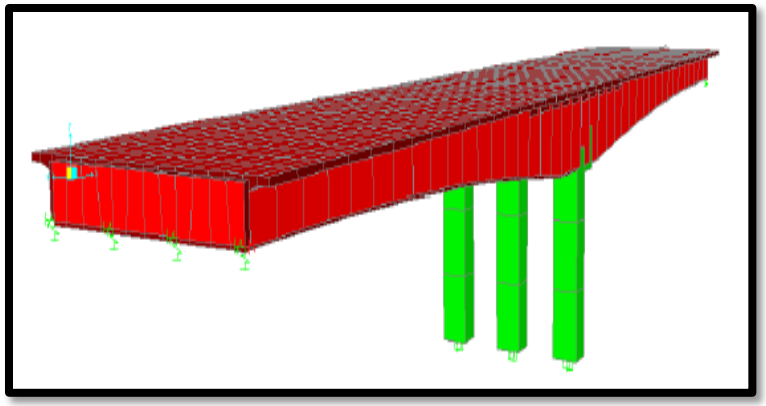
Conduct of Lab (Procedural Framework)

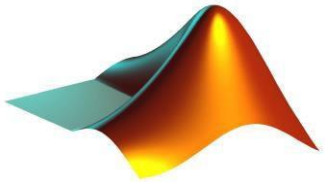
Learning Process

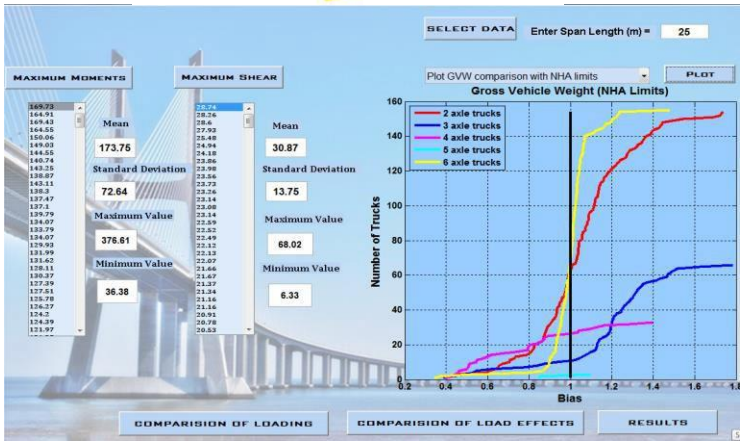
- **Course work**
- **Lab work**
- **Field Work**
  - **Engg Survey**

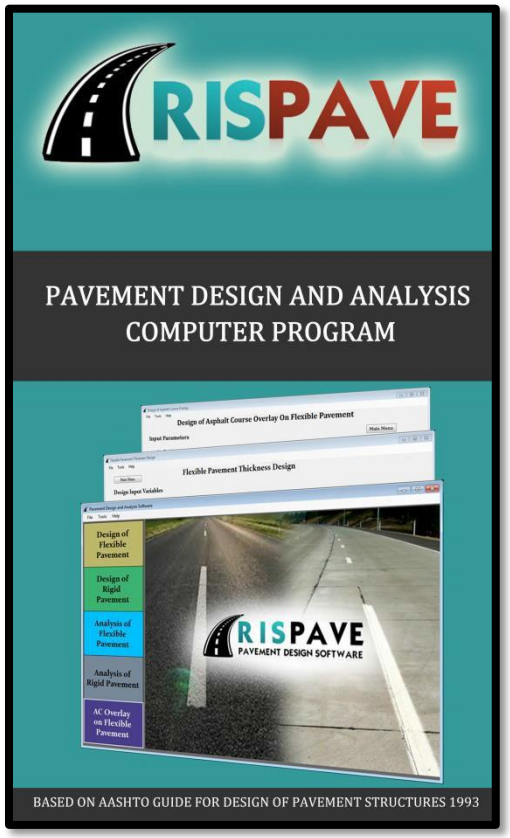
Learning Process

- Course work
- Lab work
- Field Work
- Final Year Projects





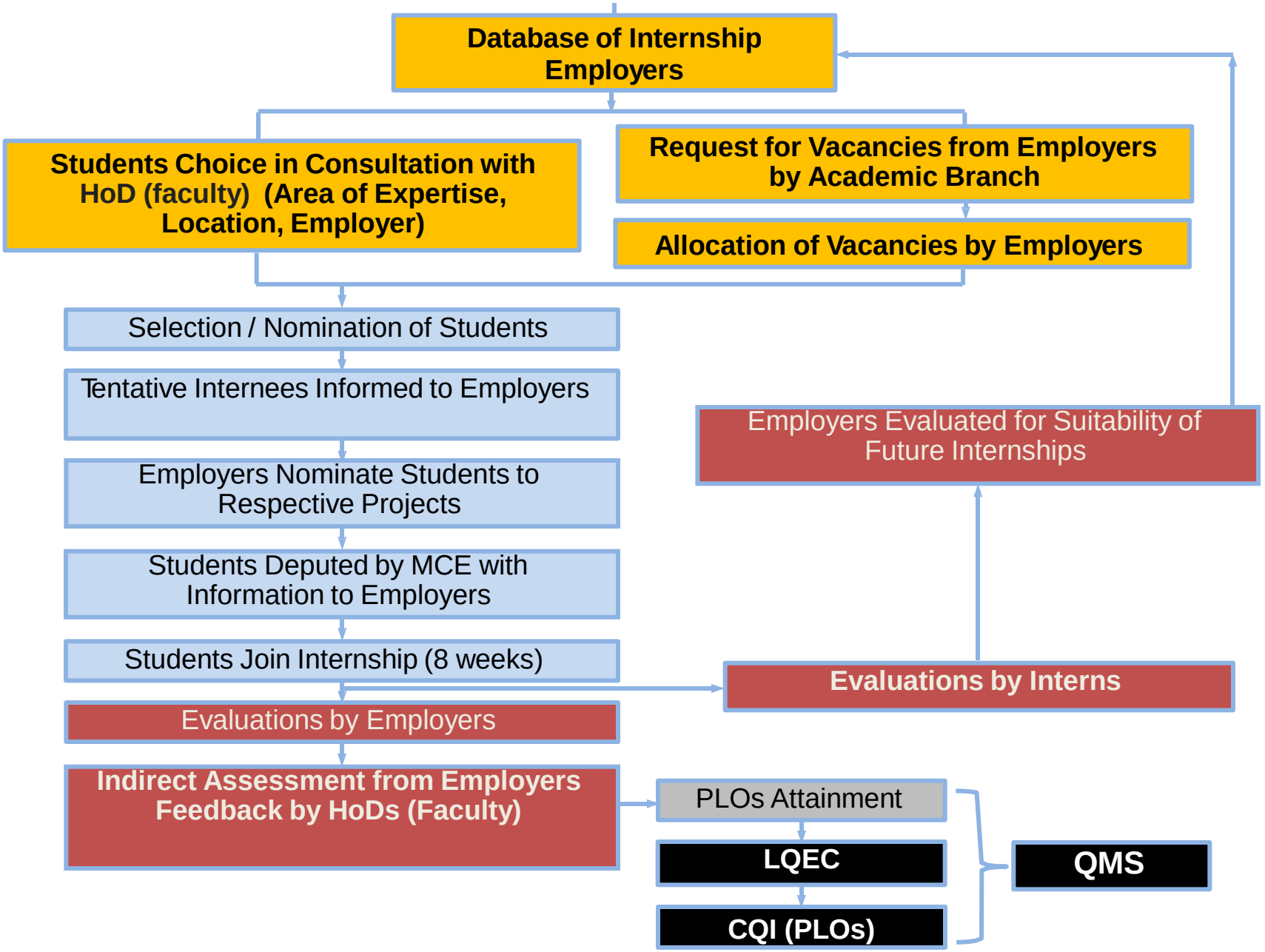




Learning Process

- Course work
- Lab work
- Field Work
- Final year projects
- Open Houses
- **Internship program**

Students Internships



Learning Process

- Course work
- Lab work
- Field Work
- Final year projects
- Open Houses
- Internship program
- **Field/site visits**

Learning Process

- Course work
- Lab work
- Field Work
- Final year projects
- Open Houses
- Internship program
- Field/site visits
- Guest Speakers

Lt Gen Shahid Niaz (R), Member Planning Commission
(Economic Prospects of CPEC & Infrastructure Development)

Dr Syed Tajammul Hussain
(Application of Nanoscience in Civil Engineering)

Brig (Retd) Dr. Nasrullah Abeer delivered lecture on 'Attabad Landslide - 10 November 2016

Learning Process

- Course work
- Lab work
- Field Work
- Final year projects
- Open Houses
- Internship program
- Field/site visits
- Guest speakers
- Sports and Declamations

Clubs and Societies

Clubs and Societies

Learning Process

- Course work
- Lab work
- Field Work
- Final year projects
- Open Houses
- Internship program
- Field/site visits
- Guest speakers
- Seminars/workshops
- NUST Clubs Extra curricular activities
- Sports and Declamations
- **Community Services**

Flood Relief

Charity Drive

Establishing Water Points

Students Counseling

NUST Center of C³A

- Emotional, health and spiritual problems are referred to NUST Centre for Counseling and Career Advisory (C³A)

C³A Centre

Parent Counseling

- Parent teacher meeting organized annually
- Parents counseling in selected cases


Parents - Teachers

HoD/Dean

- Counseling through HoDs, Dean and Principal
- Parents are informed


HoDs Counseling

Academic Advisor OIC Cadets

- Monitor students academic progress
- Regular counseling to students
- OIC cadets deals with administrative and disciples issues


OIC Cadets - Student

Continuous Quality Improvement (CQI) Process

Data / Feedback Collection

Indirect Assessment

Alumni Survey (PEOs) Employer Survey (PEOs) Exit Survey (PLOs) Internship Feedback (PLOs)

Direct Assessment

Exams (CLOs/PLOs) Final Year Project (PLOs)

OBE Sheet at Course/ Dept. Level

MCE OBE Evaluator (Program Level)

Local Quality Enhancement Cell

Analysis

Corrective Action Process (if required)

Institute CQI Process

Curriculum Review as part of CQI

- Direct/ Indirect Assessments
- Data Collection (Results, Feedbacks)
- Data Evaluation

Academic & Administrative Actions

DQEC
Department Quality Enhancement Cell

DBS
Departmental Board of Studies

FBS
Faculty Board of Studies

UCRC
University Curriculum Review Committee

ACM
Academic Council Meeting

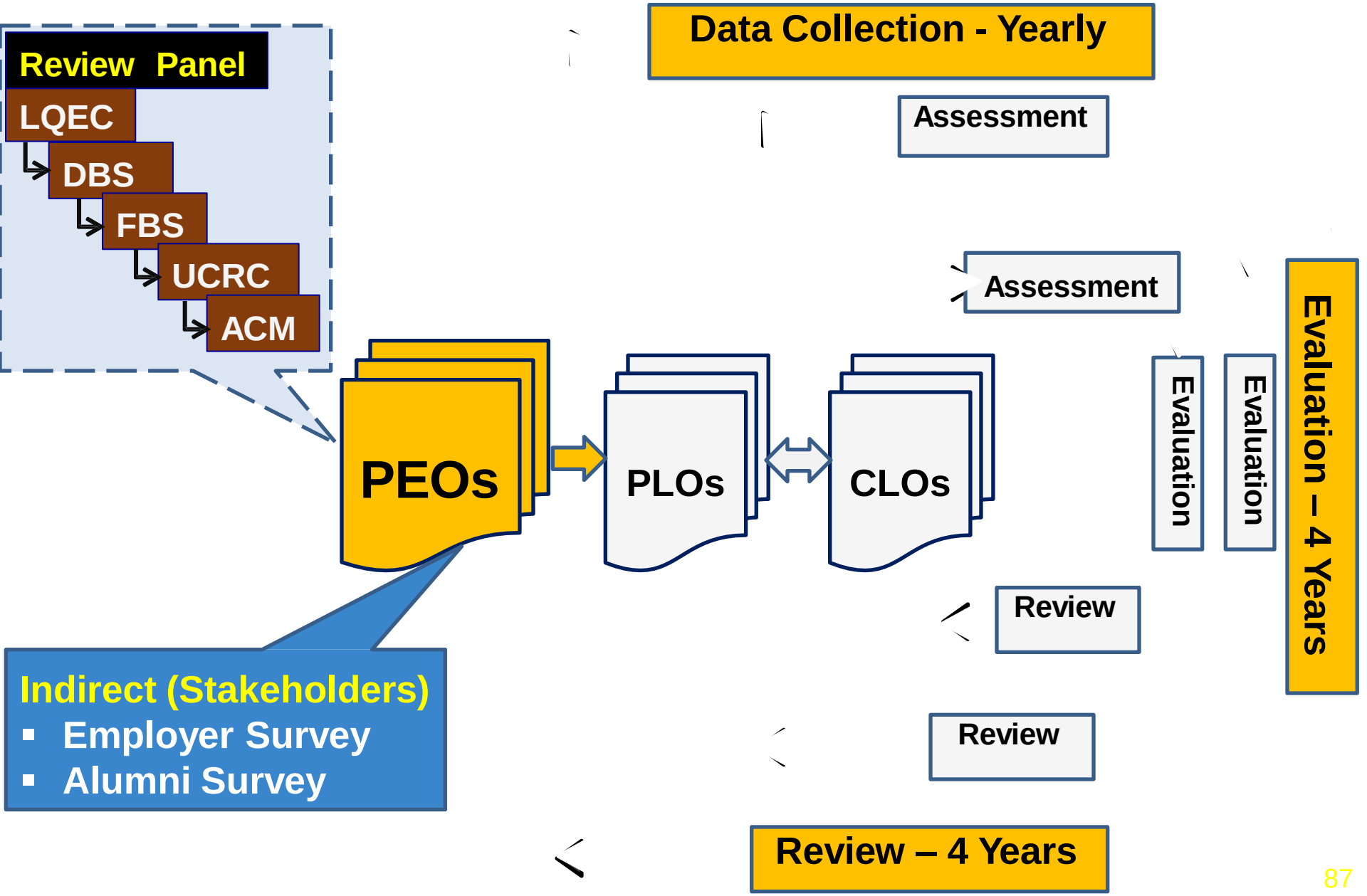
≤10% Change

≤50% Change

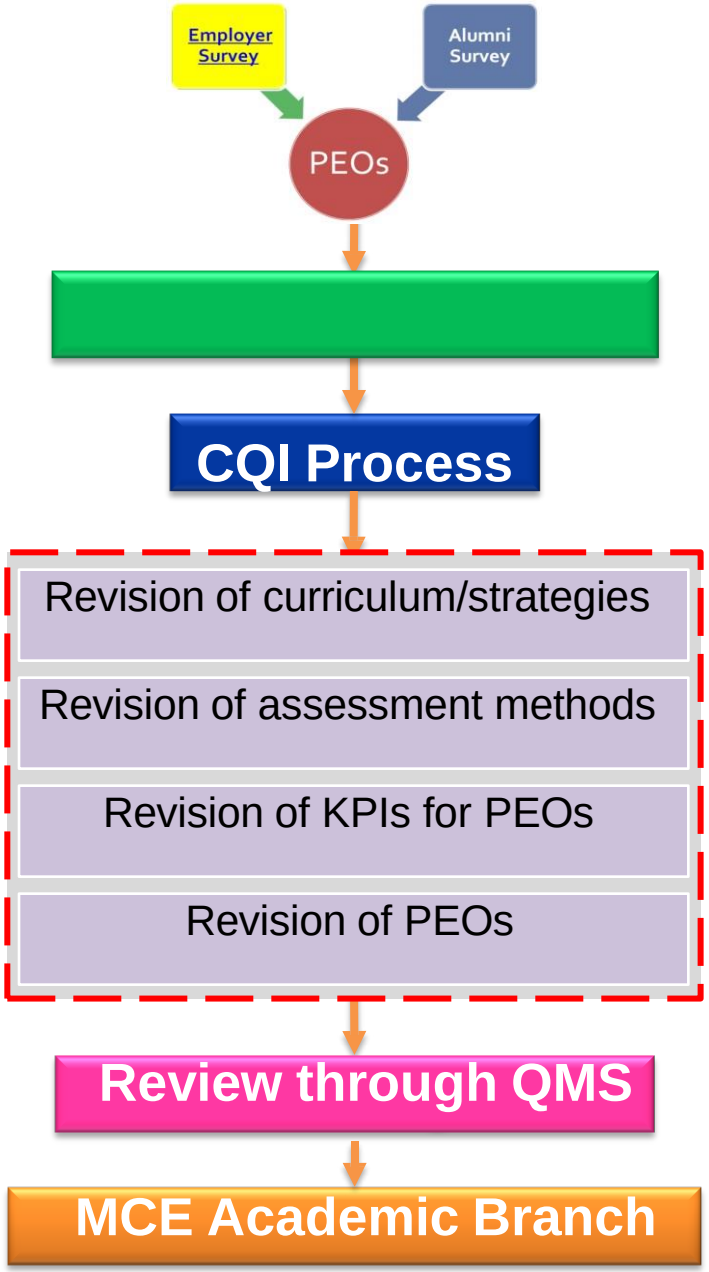
>50% Change

Stakeholders

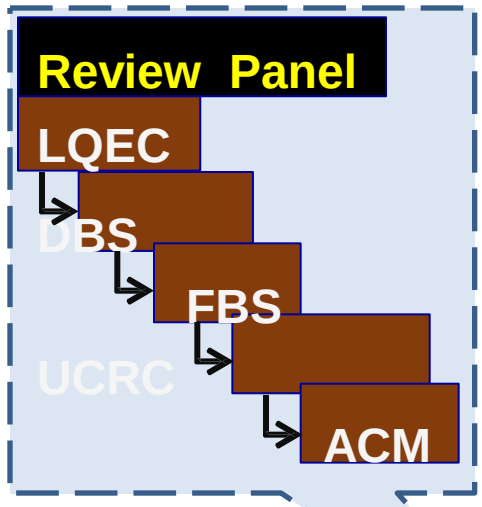
Program Evaluation - CQI



Review and Corrective Action Processes for PEOs



PLOs Evaluation - CQI



Data Collection - Every Semester

Assessment

PLOs

Direct

CLOs/ FYP

Evaluation

Review

Indirect

Internship feedback

Exit Survey

Corrective Actions (if required)

Review

- Program 4 Years
- Courses, instructions and students every semester

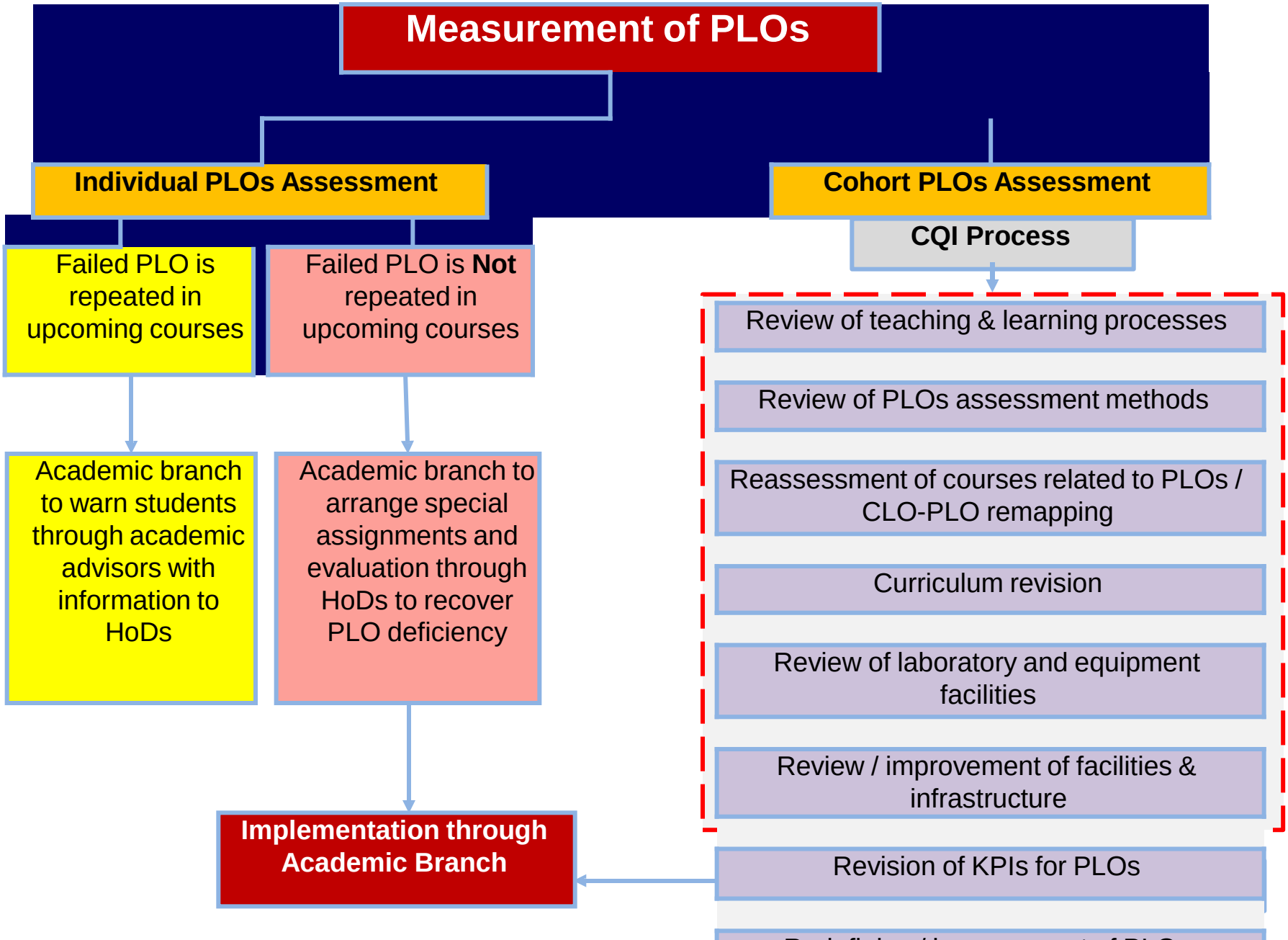
Evaluation

- Program 4 Years
- Courses, instructions, support facilities & students every semester

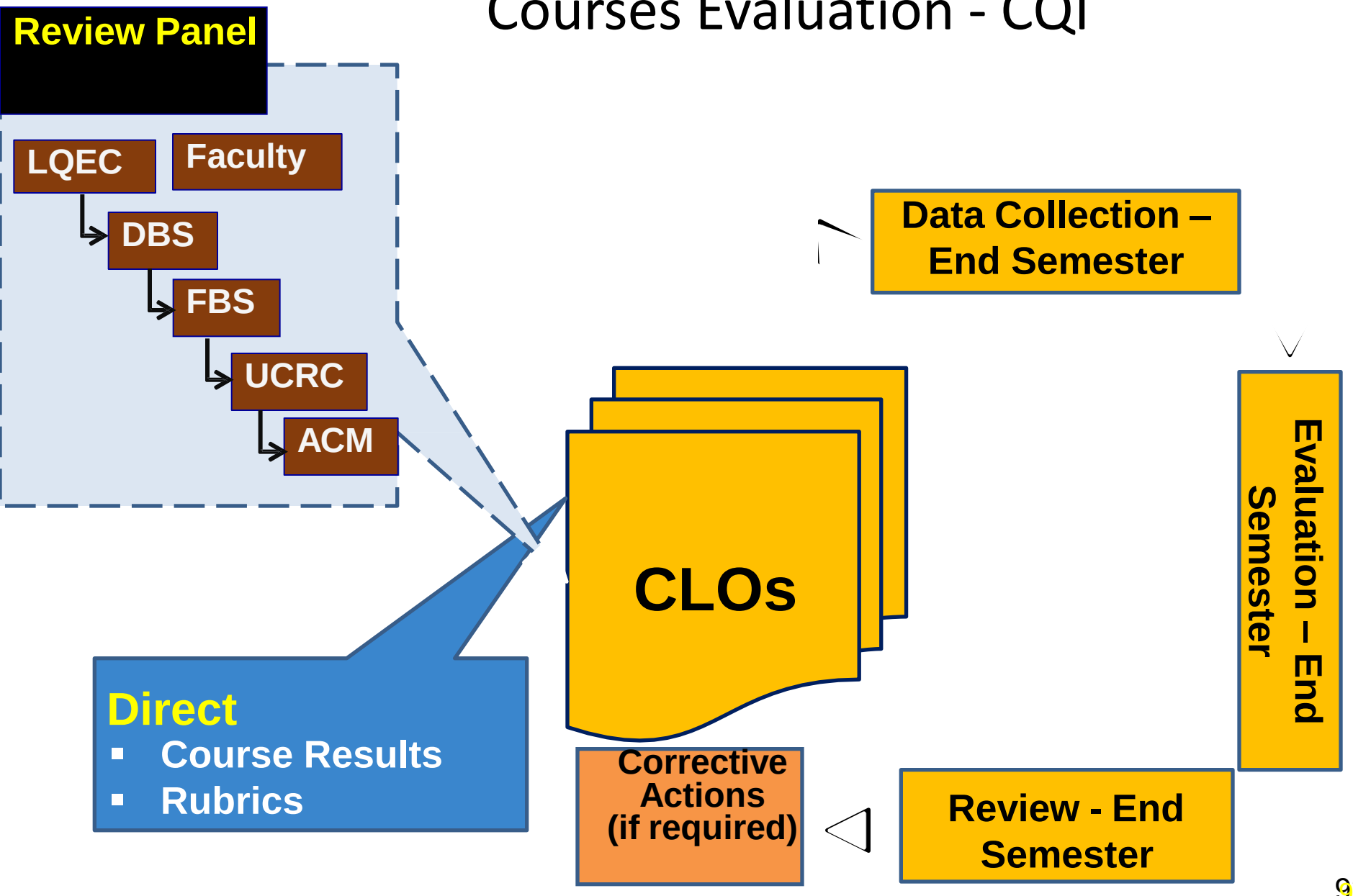
KPIs - PLOs

Assessment	Measurement Tools	Method	KPIs	When Measured
PLO 1 to PLO 12	Exams/FYP	Direct	CQI - at least 60% of cohort should attain minimum 50% for a PLO Individual – Each student should attain minimum 50% in all PLOs	At graduation
	Internship Feedback	Indirect	Minimum 60% of students attain score 3 and above on the scale of 1-5 for mapped PLOs	At culmination of internship
	Exit Survey	Indirect	Minimum 60% of students attain score 3 and above on the scale of 1-5 for each PLO	At graduation

Review and Corrective Action Processes for PLOs

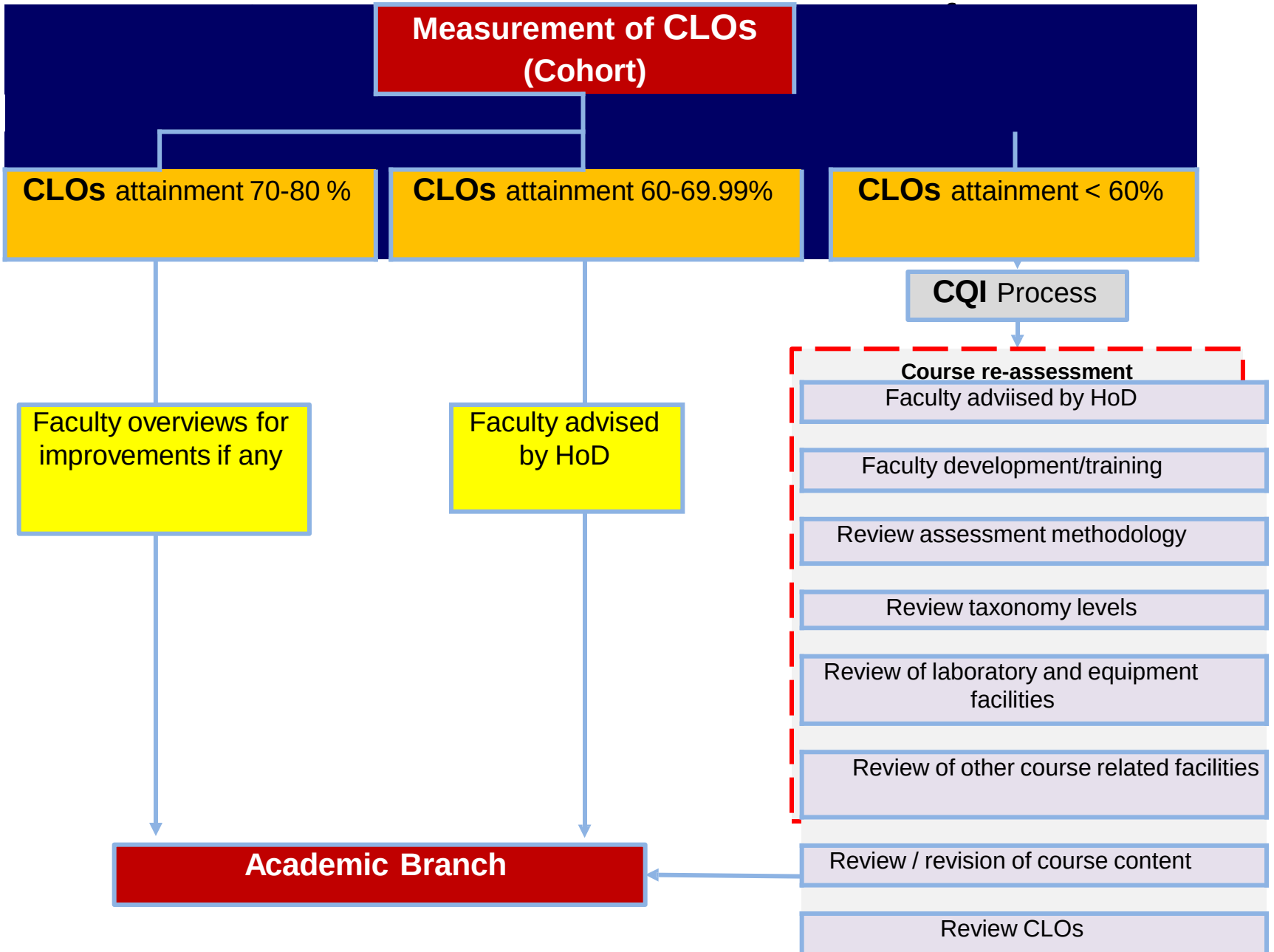


Courses Evaluation - CQI



KPIs - CLOs

Assessment	Measurement Tools	Method	KPIs	When Measured
CLOs of Respective Courses	Exams/FYP	Direct	For Course CQI: Minimum 60% of cohort to qualify each CLO	At the End of Semesters
			For Individual: Each student must attain 50% or above to qualify in a particular CLO	


Measurement of CLOs (Cohort)
CLOs attainment 70-80 %
CLOs attainment 60-69.99%
CLOs attainment < 60%
CQI Process
Course re-assessment
Faculty adviised by HoD
Faculty development/training
Review assessment methodology
Review taxonomy levels
Review of laboratory and equipment facilities
Review of other course related facilities
Review / revision of course content
Review CLOs
Faculty overviews for improvements if any
Faculty advised by HoD
Academic Branch

COI for CE 310

MIL COLLEGE OF ENGG	
UG- 2013	
FALL 2015	
SEP 2015- JAN 2016	

Course Code:	CE 310
Course:	Plain & Reinforced Concrete - II
Instructor:	Maj Muhammad Safdar
Credit Hours:	Theory: 3 / Praal:

CLO – PLO Mapping									
1	2	3	4	5	6	7	8	9	10
1	2	3							

Name	Exam	Quizzes						10%	Assignments						5%	OHTs							35%	Sessionals 50%	Practical									100%	ESE										50%	Total 100%
		1	2	3	4	5	6		1	2	3	4	5	6		1				2					Viva	Quiz			Report			Rubric				Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
		10	10	10	10	0	0		10	10	10	10	0	0		50				35					30	30			40			0				100											
	CLO	1	2	3	3	0	0		1	2	2	3	3	3		1	2	2	0	0	2	2	3	0	2	1	2	3	1	2	3	1	2	3		1	2	2	3	3	0	0	0	0	0		
	Marks	10	10	10	10	0	0		10	10	10	10	0	0		10	20	20	0	0	15	8	12	0	10	10	10	10	10	10	10	24	24	24		20	20	20	20	20	0	0	0	0	0		
Muhammad Hamza Mushtaq		6	5	6	7			6.0	9	10	8	9			4.4	4	15	14			12	2	0		19.4	29.8	6	4	8	4	8	8.5	7	13	13	17	65.3	9	10	15	14	13						30.5	62
Ali Hussain		4	9	6	7			6.5	8	7	7	7			3.6	9	19	16			15	4	5		27.8	37.9	6	4	8	8	8	8	9	16	14	16	71.3	16	18	18	18	16						43.0	79
Muhammad Yasir Baig		8	10	7	7			7.9	8	8	7	7			3.8	3	15	6			6	0	4		14.0	25.6	5	4	9	10	7	9	9	12	16	16	71.3	3	16	2	8	14						21.5	53
Azmat Rehman Gondal		5	10	9	7			7.8	9	10	8	7			4.2	5	17	13			13	0	5		21.6	33.6	8	5	7	7	9	8.5	8	15	14	18	77.0	14	16	14	20	19						41.5	76

Calculate CLOs

CLO pass %age 50 | PLO pass %age 50 | KPI for Course (%age) 60 | KPI for PLOs (%age) 60

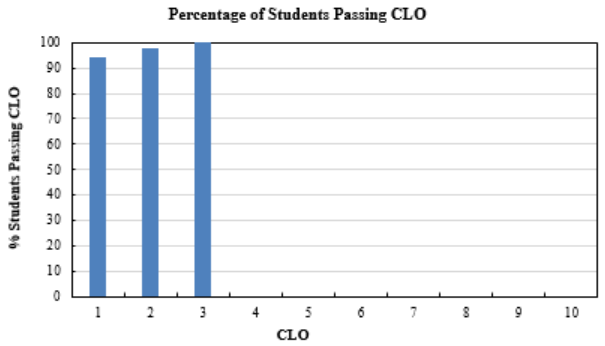
Marks Contributing CLOs														
1	2	3	4											
26	58	38												
13	38	22												
19	47	29												
10	30	23												
17	41	31												
19	48	30												
17	44	26												
17	46	28												
14	39	28												
15	32	27												
19	45	28												
16	43	29												
13	42	24												
18	39	31												
17	47	27												

CLOs % age														
1	2	3	4											
51	66	59												
73	82	76												
37	52	61												
65	72	83												
75	83	79												
64	76	69												
67	80	74												
53	67	75												
59	56	70												
72	79	75												
63	75	78												
52	74	63												
68	67	82												
66	82	72												

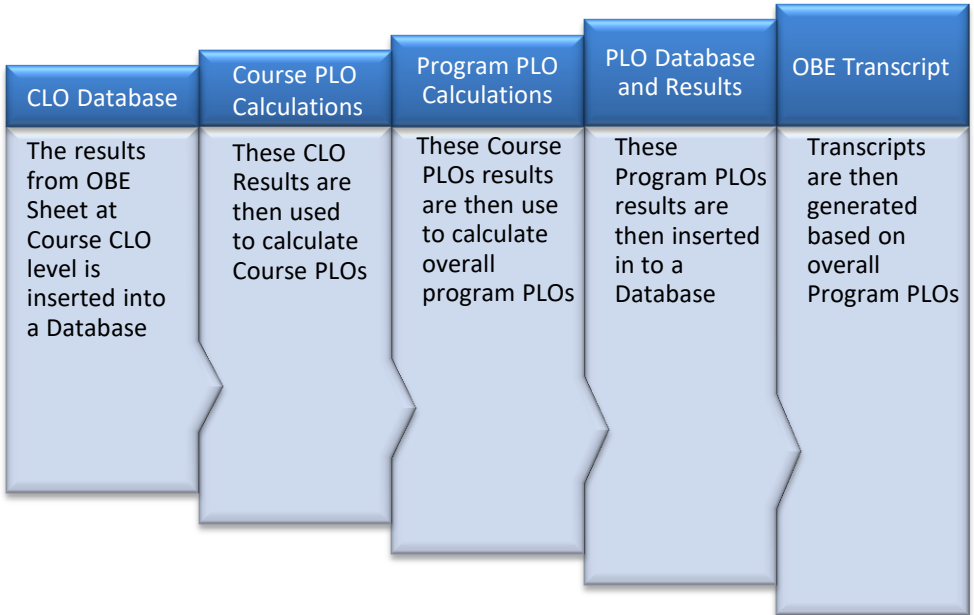
PLOs Attained (Y/N)												
1	2	3	4	5	6	7	8	9	10	11	12	
Y	Y	Y										
Y	Y	Y										
N	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										
Y	Y	Y										

Percentage of Students Passing CLO												
1	2	3	4									
94	98	100										

Percentage of Students Attaining PLO												
1	2	3	4	5	6	7	8	9	10			
Y	Y	Y										

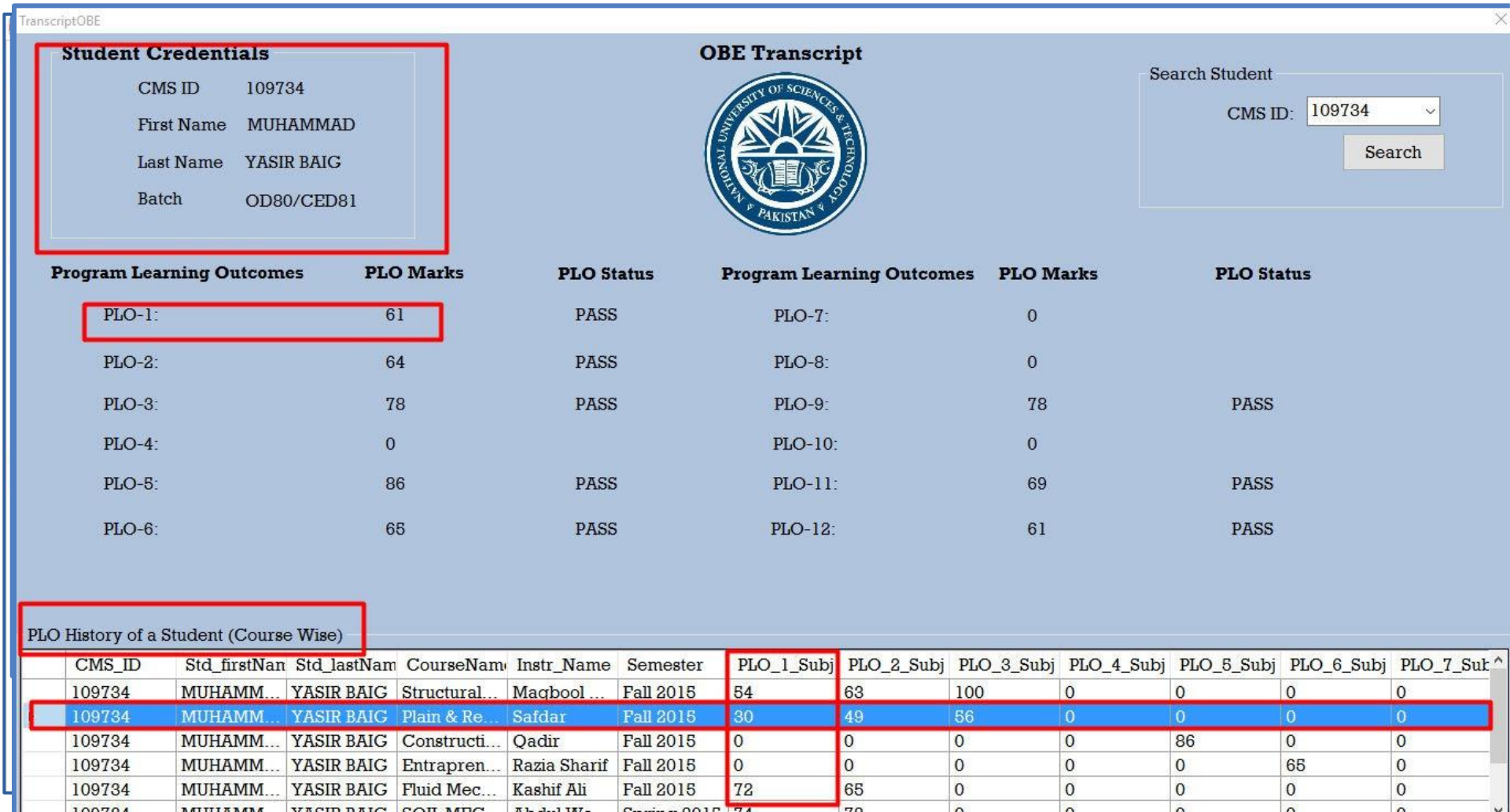



File
Menu
Evaluation
OBE Data
OBE Evaluator
Student Info
Faculty Info
OBE Course Design
Student Enrollment
OBE Evaluation
Course CLO Assessment
Course PLO Assessment
Program PLO's Assessment
PLO Result
Statistical Results
Transcript

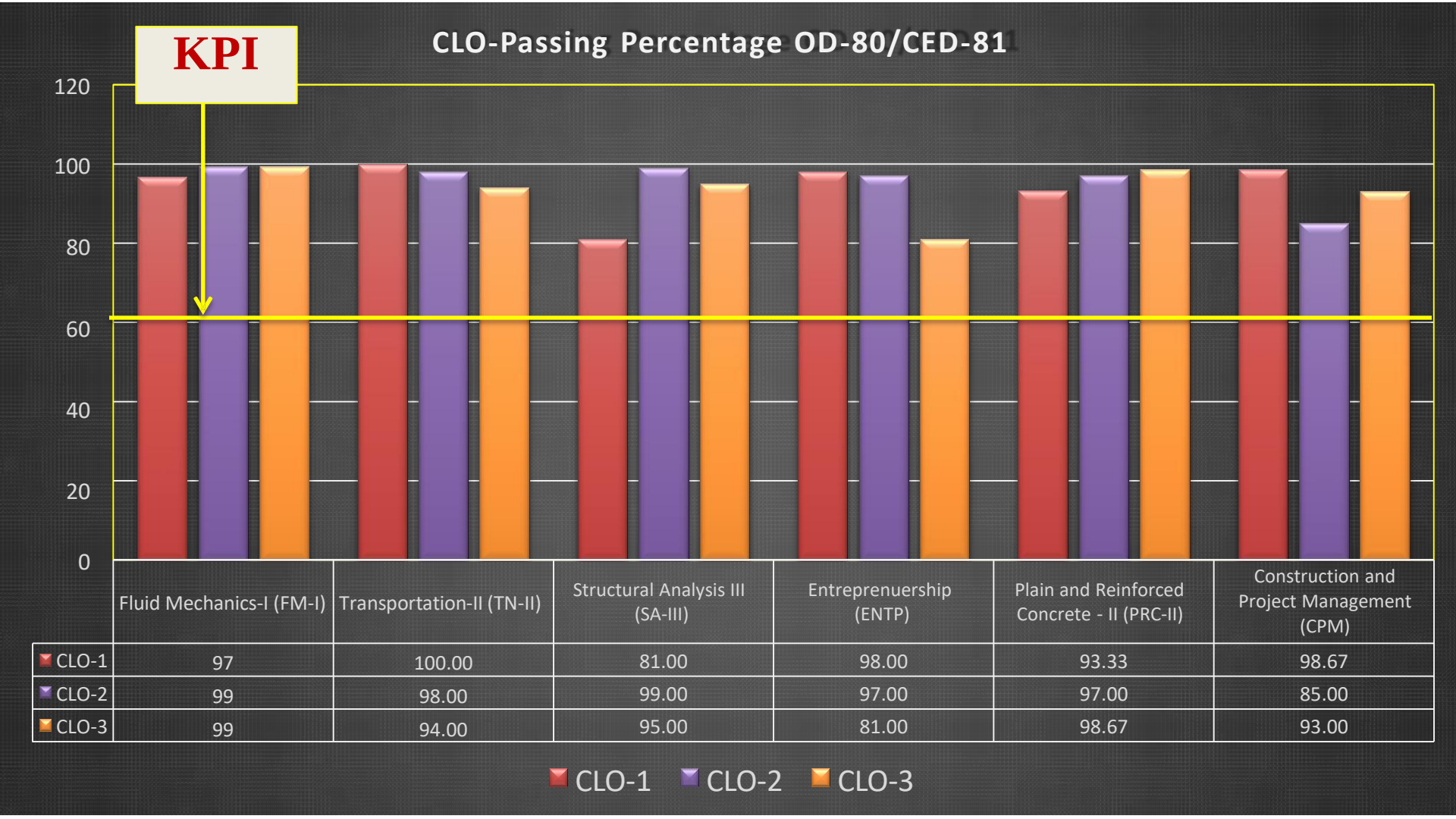

CLO Database
The results from OBE Sheet at Course CLO level is inserted into a Database
Course PLO Calculations
These CLO Results are then used to calculate Course PLOs
Program PLO Calculations
These Course PLOs results are then use to calculate overall program PLOs
PLO Database and Results
These Program PLOs results are then inserted in to a Database
OBE Transcript
Transcripts are then generated based on overall Program PLOs

OBE Evaluator

CLO Database → Course PLO Calculations → Program PLO Calculations → PLO Database & Results → OBE Transcript

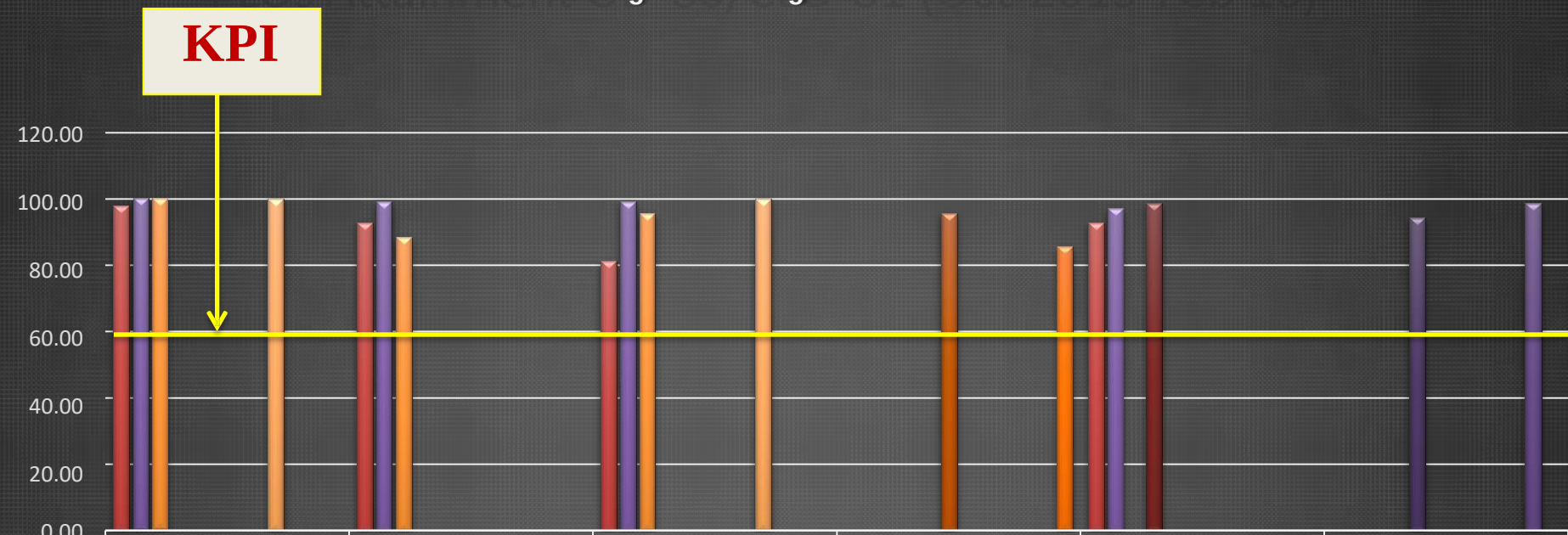


CLOs Attainment OD-80/CED-81 (Oct-2015-Feb 16)



	Fluid Mechanics-I (FM-I)	Transportation-II (TN-II)	Structural Analysis III (SA-III)	Entreprenuership (ENTP)	Plain and Reinforced Concrete - II (PRC-II)	Construction and Project Management (CPM)
CLO-1	97	100.00	81.00	98.00	93.33	98.67
CLO-2	99	98.00	99.00	97.00	97.00	85.00
CLO-3	99	94.00	95.00	81.00	98.67	93.00

PLO Passing Percentage OD-80/CED-81



	Fluid Mechanics-I (FM-I)	Transportation-II (TN-II)	Structural Analysis III (SA-III)	Entreprenuership (ENTP)	Plain and Reinforced Concrete - II (PRC-II)	Construction and Project Management (CPM)
PLO-1	98.00	92.75	81.16		92.75	
PLO-2	100.00	99.28	99.28		97.10	
PLO-3	100.00	88.41	95.65			
PLO-4					98.55	
PLO-5						94.20
PLO-6				95.65		
PLO-7						
PLO-8						
PLO-9	100.00		100.00			
PLO-10						
PLO-11						98.55
PLO-12				85.51		