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PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi

GUIDELINES FOR OUTCOMES BASED EDUCATION

(These Guidelines are made in pursuant to Section 9(iv) of the Regulations for Curriculum Design, Development and Review [R-1])

November 2019
[Version 1.0]

[As Approved at the 13th Meeting of BOM and ratified by the BOG at its 13th Meeting, both held on November 9, 2019]

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GUIDELINES FOR OUTCOME BASED EDUCATION (OBE)

(Under Section 9 (iv) of the Presidency University Regulation No. R-1)

PREAMBLE

i. Outcomes Based Education (OBE) is student- focused instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes. Its focus remains on evaluation of outcomes of the program in terms of knowledge, skill and behaviour a graduate is expected to attain upon completion of a program. These outcomes are indicatively drawn from 'Graduate Attributes' that have been identified in the respective discipline[s]. In the OBE model, the required framework of knowledge and skill sets are drawn out and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

ii. In other words, the attributes of a Graduating student are defined first, ways to achieve them are suggested next and finally if those attributes are met during the program implementation or not is measured for both ascertaining attainment as well as for continuous improvement in enhancing this attainment.

iii. As against the final examination results and student placement as the only learning indicators in the traditional model, the OBE model focuses on learning outcomes from various perspectives involved in learning and also aligning these perspectives to the program's mission statement.

BACKGROUND AND SCOPE

i. Outcome-Based Education is a recent development in modern curriculum planning and outcome-based educational models have been used successfully worldwide. In India, OBE is a recent development after the induction of India in the Washington Accord (WA) in 2014 and granting of permanent signatory status to the National Board of Accreditation (NBA). This makes it possible for an Engineering graduate from India to practice engineering in any of the signatory countries, so long as the graduate has successfully completed her/his graduation from NBA-accredited program. This is a transformational change in higher education system as it makes movement of skilled labour, easy across

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WA signatory countries and also makes it competitive. Further, this change eventually standardizes quality of higher education in engineering across these countries.

ii. Under the terms of the Accord, for Indian institutions to get accredited by NBA, it is compulsory that such institutions follow the Outcome Based Education (OBE) model.

iii. The adoption of OBE is considered to be a great step forward for higher education in India but the actual success of OBE will lie in effective adoption and stringent accreditation process to ensure the quality of education is maintained. The National Assessment and Accreditation Council (NAAC) too has included OBE as an assessment metric across all Programs in the accreditation process for higher education institutions.

SHORT TITLE AND APPLICATION

i. This Guideline shall be called the "Presidency University Guidelines for Outcome Based Education, 2023.

ii. This Guideline shall come into effect from the date of approval by the Academic Council of Presidency University and ratified by appropriate higher bodies.

EXTENT AND APPLICABILITY

i. This Guideline shall apply to the curriculum design and development of the academic Programs and courses of the University, offered through its Faculty, Schools and Departments.

ii. These guidelines are framed to align the Program curricula of various Schools of the University with Outcome based education (OBE) model.

i. These guidelines would help in improving the quality of academic structure and deepen both program and course delivery within the university, as also to bring about a certain degree of uniformity in the Program structure.

ii. The guidelines would also help course teachers to meet basic requirements to teach the course, and to understand the nuances of OBE concept and methodology. The guidelines also list various templates required in implementing OBE.

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1. DEFINITIONS

1.1. Definitions as specified in the Act, the Statutes and the Ordinances shall apply unless the context requires otherwise. However, definition of terminology specific to these Guidelines shall be as under:

i. **Assessment**: It is a process to know whether an Institution is in accord with the objectives set by its accrediting body, whether the academic Programs fulfil their mission (objectives), how effective are the courses and what is the degree of students learning attainments? Assessment is a key indicator of the level of learning and that students are able to see their learning attainments. Assessment, therefore, can help motivate students just as it helps teachers to improve their teaching.

ii. Assessment under the OBE model can be through direct or indirect measures:
   a. Direct Assessment: is tangible, i.e., the direct check or assessment of student's knowledge or skills against measurable learning outcomes such as, comprehensive examinations, class tests, continuous evaluation techniques (if assessment tools are used), practical classes, simulations, capstone projects, etc.
   b. Indirect Assessment: are the ones that are intangible and hence not measurable but are used to measure implicit qualities of student learning, such as values, perception and attitudes of students. Indirect methods can be attendance, performance in soft skills, student surveys, exit interviews, etc.

iii. Blooms Taxonomy Framework: Provides one of the first systematic and easy-to-understand frameworks for classification of thinking and learning, and is also a clear and robust tool for guiding the development of teaching and learning. The taxonomy identified the following levels of cognitive learning (arranged from lower order to higher order of learning levels):
   a. Knowledge: Remembering of previously learned material and recall of a wide range of material or specific facts;
   b. Comprehension: Ability to grasp the meaning of previously learned material, interpreting material or by predicting consequences or effects;
   c. Application: Ability to use learned material in new and concrete situations and may include application of rules, methods, concepts, principles, laws and theories;

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d. Analysis: Ability to break down material into component parts to understand organizational structure, analysis of relationship between the parts, etc.;
e. Synthesis: Ability to put parts together to form a new whole; leading to production of unique communication (thesis or speech), plans of operation (research proposal) or a set of abstract relations (scheme for classifying information); and
f. Evaluation: Ability to judge the value of material for a given purpose based on definite internal or external criteria.

1.2. Bloom's Taxonomy was revised with slight modifications in 2001.

i. **Outcomes-Based Assessment**: means an assessment based on intended students learning outcomes to assist the faculty, administration and the staff in making informed decisions about their respective areas with the aim to enhance quality.

ii. **Intended Learning Outcomes (ILOs):** These are statements that describe the desired learning that students should have acquired and should be able to demonstrate at the end of a Program of study.
   a. A learning outcome is what a student CAN DO as a result of a learning experience. It describes a specific task that a student is able to perform at a given level of competence under a certain situation. The three broad types of learning outcomes are:
   b. Disciplinary knowledge and skills
   c. Generic skills
   d. Attitudes and values

iii. **Program** means a Program of study offered by the University through its Schools/ Colleges/Institutes leading to the award of a degree.

iv. **Course** means a course or a subject as a unit for the purpose of conduct of any Program of study of the University.

v. **Course Code** Is a unique identifying code given to the courses/subjects as mark of identity as well as for the purpose of examinations. It is in alpha-numeric code wherein the first three letters are related to the program and numerical numbers denote the course serial number based on the year (i.e. ARK201 is an Architecture course offered in the second year). In case there is a change of 20% or more in the syllabus, a new code will be assigned after taking necessary approvals.

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vi. **Program Educational Objectives (PEOs):** These describe the career and professional accomplishments that a Program is expected to prepare the students to attain at graduation. PEOs area few broad statements of objectives (generally 3-5) that describe what graduates are expected to attain from the Program to have successful professional careers. The PEOs should be well documented and should also align with the mission of the School.

vii. **Program Outcomes (POs):** Are the intended Program learning outcomes that students of a particular Program should be able to demonstrate when they have completed or participated in a Program. They represent the big picture and encompass multiple learning experiences. PO's should be measurable and verify knowledge, skills, abilities, and/or attitudes that students have attained during the completion of a program. Generally, a program can have 10-15 POs corresponding to the graduate attributes of that particular discipline

viii. **Course Objectives (COs):** Course objectives are clear and concise statements that describe what the students intend to learn by the end of the course. The course syllabus should indicate both the course objectives and the learning outcomes.

ix. **Course Outcomes:** Express what the students will actually learn through a course or subject. These are synonymous with learning outcomes though this term denotes the learning actually attained by a student. In other words, learning outcomes identify what the learner will know and be able to do by the end of a course or program. The purpose of Course Objectives and learning Outcomes will be to:

   a. Align objectives with course content and evaluation methods;
   b. Clearly communicate the expectations of students from a course;
   c. Establish a logical sequence of learning milestones;
   d. Provide an opportunity for students to make connections across courses and institutional goals.

x. **Unit** is a component of a course. Generally, the course syllabus may be divided into five units with each unit having three sub-units. This will be the scheme for recording attendance as well in v-Attendance App.

xi. **Rubric** is a set of instructions or statement of purpose or function. In education terminology, a rubric is typically an evaluation tool or set of guidelines (metrics) used to

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promote the consistent application of learning expectations, learning objectives or to measure student's attainments against a consistent set of criteria. It spells out consistency in the scoring criteria so that multiple teachers using the same rubric would arrive at the same score and it also helps make evaluation as objective as possible.

xii. **Capstone Report** means an Internship Report or a Thesis/Dissertation prepared at the end of a Program.

xiii. **Vision and Mission:** mean the Vision and Mission of the University or that of a School/Department/Institute of the University.

Definitions specified in the Act, the Statutes, and the Regulations shall apply unless the context requires otherwise.

2. OBE BASED CURRICULUM

i. The University will follow the process of 'Constructive alignment' to build up an OBE syllabus. This term coined by Professor John Biggs in 1999 refers to the process to create a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes. The word 'constructive' refers to what the learner does to construct meaning through relevant learning activities. The 'alignment' aspect refers to what the teacher does. The key to the alignment is that the components in the teaching system, especially the teaching methods used and the assessment tasks are aligned to the learning activities assumed in the intended outcomes.

ii. Therefore, the OBE based curriculum should start with a clear picture of what is important for students to be able to do, and then organize the curriculum, instruction and assessment to make sure this learning ultimately happens.

iii. For a curriculum to be OBE aligned, the Vision and Mission of the University/Mission of a School should be aligned with the Program Educational Objectives (PEOs), which in turn should be mapped with the Program Outcomes [POS]/Program Specific Outcomes (PSOs)/intended Student Learning Outcomes [ISLOs], and the Course Outcomes (COs).

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3. PROGRAM STRUCTURE DESIGN

i. There will be three essential elements for designing a curriculum for any academic Program, namely:

a. **Program Structure** - (Broad Program outline)

b. **Course Curriculum** (For all courses of a program) in one of the following formats:

- Template A1 (for Theory courses/subjects)
- Template A2 (for Practical courses)
- Template A3 (for Jury subjects/studios/projects/dissertations)

c. **Instructional Plan**:

- Template B1 (for Theory courses/subjects)
- Template B2 (for Practical courses)
- Template B3 (for Capstone projects like Jury courses/studios/ projects/dissertations)
- Template C (would additionally be prepared for Jury courses/studios/ projects/dissertations listing out the Projects with description, studio work and dissertation topic along with scope of work and precise deliverables)

S. N	Course	Curriculum Template	Instructional Plan template	Additional template
1	Theory	A1	B1	
2	Practicals	A2	B2	
3	Jury courses/ Studios/ Projects/ Dissertations	A3	B3	Template C: List of Projects with description, studio work, dissertation topic with scope of work and precise deliverables (to be uploaded on LMS)

4. PROGRAM STRUCTURE TEMPLATES

4.1 A standard Program Structure Template for the Program curricula of the University will be as under:

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i. Vision, Mission of the University

Program Structure Template

Vision of the University

To be a value-driven global University, excelling beyond peers and creating professionals of integrity and character having concern and care for society

Mission of the University

- Commit to be an innovative and inclusive institution by seeking excellence in teaching, research and knowledge transfer.
- Pursue research and development and its dissemination to the community at large.
- Create, sustain and apply learning in an interdisciplinary environment with consideration for ethical, ecological and economic aspects of nation building.
- Provide knowledge-based technological support and services to the industry in its growth and development.
- To impart globally applicable skill sets to students through flexible course offerings and support industry's requirement and inculcate a spirit of new venture creation.

ii. Program Educational Objectives (PEOs)

a. Writing Program Educational Objectives (PEOs

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. These can also be in a cluster for similar programs.

PEO1 :

PEO2 :

PEO3 :

PEO4 :

PEO5 :

PEO6 :

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iii. Methods of describing PEOs

STEP 1: The needs of the Nation and society are identified through scientific publications, industry interaction and media.

STEP 2: Taking the above into consideration, the PEOs are established by the faculty of the department.

STEP 3: The PEOs are communicated to the alumni and their suggestions are obtained.

STEP 4: The PEOs are communicated to all the faculty members of the department and their feedback is obtained.

STEP 5: The PEOs are then put to the Board of Studies of the department for final approval.

Note: A file may be prepared on how these PEOs have been arrived at.

iv. Mapping of PEOs with School Mission Statements:

Rubric template:

PEO Statements	School Mission 1	School Mission 2	School Mission 3	School Mission 4
PEO1:				
PEO2:				
PEO3:				
PEO4:				
PEO5:				
……				

- Correlation levels will be: 1. Slight (Low); 2. Moderate (Medium); 3. Substantial (High)
- If there is no correlation, put '-'

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v. Program Outcomes (POs)

Program Outcomes

PO1 :

PO2 :

PO3 :

PO4 :

PO5 :

PO6 :

PO7 :

PO8 :

PO9 :

PO10 :

PO11 :

PO12 :

Program Specific Outcomes

PSO1 :

PSO2 :

PSO3 :

PSO4 :

Note 1:For developing POs and PSOs please refer to Annexures.
Note 2:Standard POs have been defined by NBA for Engineering and Pharmacy Programs. Other Schools can prepare POs for their respective Programs accordingly.
Note 3: It is not mandatory to have all 12 POs - it may be less also.

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vi. Mapping rubric for Program Outcome Vs Program Educational Objectives.

	PEO1	PEO2	PEO3	PEO4	PEO5
PO1					
PO2					
PO3					
PO4					
PO5					
PO6					
PO7					
PO8					
PO9					
PO10					
PO11					
PO12					
PSO1					
PSO2					
PSO3					
PSO4					

- Correlation levels will be: 1. Slight (Low); 2. Moderate (Medium); 3. Substantial (High)
- If there is no correlation, put '-'

4.2 Program Outcome Vs Course Outcome Mapping Rubric:

i. Course Articulation Matrix

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PSO 2	PS O3	PSO 4
CO201.1																
CO201.2																
CO201.3																
CO201.4																

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CO201.5																
…….																
…….																

- Correlation levels will be: 1. Slight (Low); 2. Moderate (Medium); 3. Substantial (High)
- If there is no correlation, put '-''

5. OBE ASSESSMENT/EVALUATION

5.1. Assessment/Evaluation:

i. Assessment is important in an outcome-based model as it indicates whether the students have learnt what was expected to be learnt. The OBE model measures the progress of the Graduating student in three parameters, namely:
   a. Program Educational Objectives (PEOs)
   b. Program Outcomes (POs)
   c. Course Outcomes (COs)

ii. Program Educational Objectives (PEO): These are broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEOs are generally measured 4-5 years after graduation for impact. The Program Educational Objective is measured through Employer Satisfaction Survey (yearly), Alumni survey (yearly), Placement records and higher education records.

iii. Program Outcomes (POs): Are narrower statements that describe what the students were expected to know and be able to do by the time of graduation. Program Outcomes should reflect the 12 Graduate attributes as described by NBA for undergraduate engineering programs.

iv. Course Outcomes (COs): Course outcomes are the measurable parameters which evaluates each student's performance for each course that the student undertakes in every semester. The various assessment tools for measuring Course Outcomes include Mid -Semester and End Semester Examinations, Tutorials, Assignments, Project work, Lab practical, Presentations, Employer/ Alumni Feedback etc. These course outcomes are mapped to Graduate attributes and Program Outcomes based on relevance. This evaluation pattern helps Institutions to measure the Program Outcomes.

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5.2. Designing Assessment Tasks

i. **Outcome-Based Assessment (OBA)** asks us to first identify what it is we expect students to be able to do once they have completed a course or program. It then asks us to provide evidence that they are able to do so. In other words, how will each learning outcome be assessed? What evidence of student learning is most relevant for each learning outcome and what standard or criteria will be used to evaluate that evidence? Assessment is therefore a key part of outcome-based education and used to determine whether or not a qualification has been achieved.

5.3. Methods of Evaluation

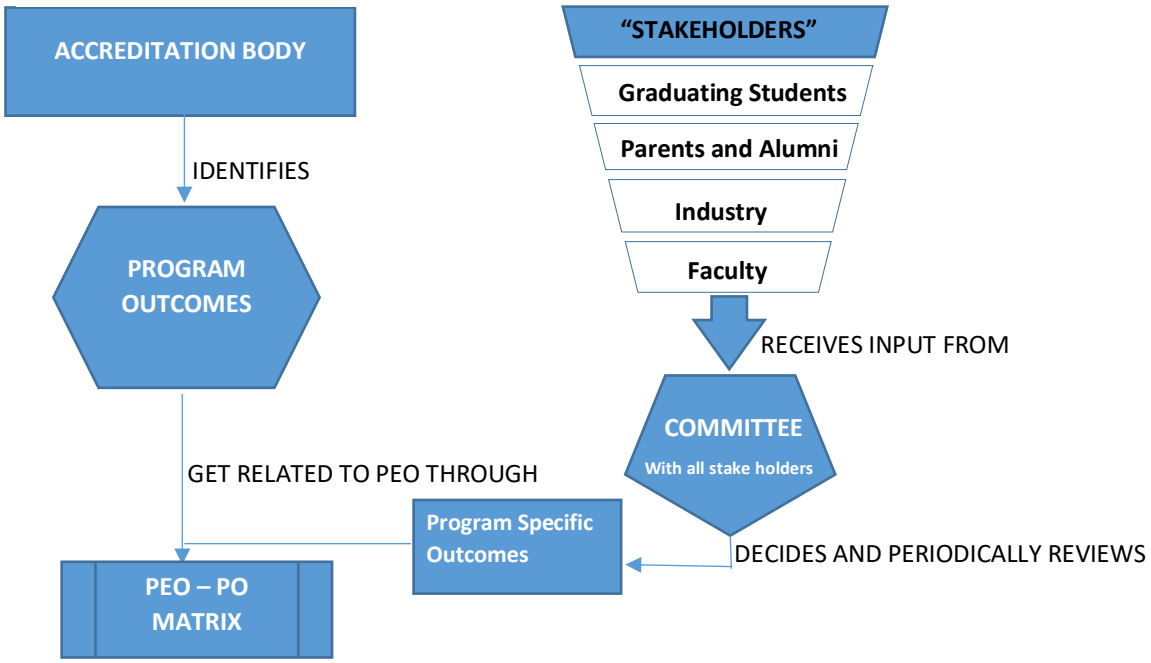
i. The mapping methods are generally used for assessment and evaluation, which are almost similar. For this, every question set for an exam will be mapped to one or more COs which effectively will help to determine the achievement by each student in the examinations. The mapping of COs towards a POs is evaluated using descriptors such as High, Medium, Low, etc. In each assessment method, the final results and conclusions are used in arriving at the extent to how much the students have attained the COs & POs specified.

ii. In this guideline, the concept of POs, COs, PSOs, PEOs are already defined. In this section, the guideline defines the assessment and attainment of COs & POs.

5.3 Aligning Outcomes

In the earlier section of this guideline defines the outcome alignments which is recapped in the following graphic.

Arriving at PO – PEO



Every COs should be mapped to different POs and PSOs based on the influence of COs on them.

5.4. Assessment

i. It implies a group of processes that define, collect, and prepare data to evaluate the achievement of Program Outcomes and program educational objectives for purpose of enabling qualified graduates for a specific profession. The assessment process runs continuously throughout the progression of student through the program.

ii. Direct and Indirect measures for Assessment

iii. Direct method of assessment is based on actual student work, including reports, dissertations, examinations, performances, and other defined academic accomplishments. This involves students to produce a body of work that reviewers can assess whether students meet expectation.

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5.4.1. Assessment Tools for Direct Measurement.

The set of Assessment Tools can consist of following

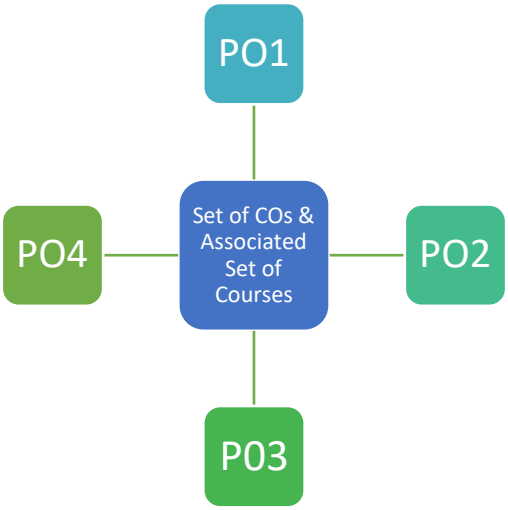
i. Pre and post-tests
    a. Multiple-Choice Question (MCQ)
    b. Essay Test Question
ii. In Course Assessment (viz, homework assignment; essays, locally developed tests)
iii. Comprehensive exams
iv. Standardized test
    a. National Achievement Test (GATE, GMAT, GRE etc)
    b. Certification exams, licensure exams (BAR Council, Pharma Council etc)
v. Portfolio evaluation (specifically for visual and performing arts)
    a. Design portfolio,
    b. Architecture Portfolio
    c. Musical pieces
    d. Painting collections
vi. Case Studies
    a. Business Case Studies
    b. Legal Case Studies
    c. Medical Case Studies
vii. Published Works
    a. Indexed Journals
    b. Journals of Repute
    c. Poster Presentation
viii. Capstone projects
ix. Class project (individual or group)
x. Internship and clinical evaluation

5.4.2. Assessment Tools for Indirect Measurement

Indirect method of assessment is based on a report of perceived student learning. These indirect measures of assessment offer prospects for students to reflect on their learning. The reviewers assess students' perceptions of their learning experience.

i. Exit interviews
ii. Surveys
    a. Departmental survey
    b. Alumni survey
    c. Employer survey
    d. Survey of current students
    e. Survey of faculty members
    f. Survey of internship supervisors
    g. Survey of employers
iii. Focus groups
iv. Job placement statistics
v. Graduation and retention rates
vi. Percentage of students opting for higher studies

5.5. How to use this mapping in Assessments to attain the POs.



i. For Direct Assessment, the mapping methods used are almost similar for most of the tools. For example, in an examination, each question prepared will be mapped to one or more

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COs which effectively will enable determination of the achievement of each student in the examination. By deploying the Anderson-Bloom taxonomy table of cognitive processes, it is decided that the questions asked could provide a mart of achievement. Further, each question should be mapped to a CO. In turn, every CO should be mapped to a PO. Likewise, in each assessment methods, the final results and conclusions are used in arriving at the extent regarding student's attainment of COs and POs.

ii. Finally, the POs can be calculated by using affinity descriptors which can defined as High, Medium and Low. The computation of exact strength of descriptor gives a method of CO-PO attainment.

iii. The proper assessment of the COs and POs is one of the most key processes in preparation of SSR for NAAC accreditation. It should be done with precision and planning. An example of mapping CO – PO with affinity descriptor is presented as under.

5.6 Mapping POs and COs

	Level of correlation:					Program Outcomes					
	1= Low	2= Moderate	3= High			PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
Program Name	Semester	Course	course code	Course Outcome code	Course outcome Statements						
				CO1		2	3	-	2	1	3
				CO2		-	-	3	1	-	3
				CO3		-	-	-	2	3	3
				CO4		3	-	2	2	2	-
				CO5		-	2	-	-	2	-

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5.7 Mapping of CO with Assessment Methods

Program Name	Semester	Course	course code	Course Outcome code	Class Test			Presentation /Assignment		Lab Exam	Sem End exam
					T1	T2	T3	A1	A2		
				CO1	2	-	-	3	-	3	3
				CO2	1	2	-	3	-	3	3
				CO3	3	2	2	1	2	3	3
				CO4	-	2	2	-	3	3	3
				CO5	-	-	3	-	3	3	3

5.8 Assessment – Level of CO Attainment

i) HA (3) – 70 % or more students score the set average

ii) MA (2) – 60% to 70% students score the set average

iii) LA (1) – 50% to 60% students score the set average

iv) NA (0) – Less than 50% students score the set average

(HA – High Attainment, MA – Medium Attainment, LA – Low Attainment, NA – No Attainment)

5.9 Computation of Attainment

- As an example, if the set Average is 35 marks out of a maximum of 50 marks
- And if, 47 students in a class of 65 get 35 or more then 72.3% of students have scored the set average.

  Therefore, the attainment level is HA or 3.

5.10 Assigning Level of Attainment

Direct measures →	T1			T2			T3			A1	A2	L1	FE
Question number	q1	q2	q3	q1	q2	q3	q1	q2	q3				
Course outcome	c1	c2	c3	c2	c3	c4	c3	c4	c5	C1 C2 C3	C3 C4 C5	All	All
Maximum marks	10	20	20	10	20	20	10	20	20	10	10	25	50

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Reg No	Stu Name	**Attainment level (60%)**	6	12	12	6	12	12	6	12	12	7.5	7	22	40
No. of students attending question			40	40	40							40	40	40	40
No. of Students attained CO			19	31	33							35	31	26	22
CO percentage			47.5	77.5	82.5							87.5	77.5	65	55
Level			LL	HH	HH							HH	HH	MM	LL

5.11 After completing the calculation in the above matrix, it might look like this

	Class test			Presentation /Assignment		Lab Exam	Sem End exam
	T1	T2	T3	A1	A2	L1	FE
Average marks of students in the current year	32	38	31	7	8	23	38
Set average (last 3 groups average)	30	30	30	7.5	7	22	40
% attainment	51	71	68	61	77	78	67
Level of attainment	LA	HA	MA	MA	HA	HA	MA

5.12 CO attainment calculation

	Internals		**Final CO Attainment****	
CO	Percent##	Level	Percent	Level
CO 1	67.5	2	57.5**	1
CO 2	75.4 (assumed)	3	59.8**	1

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	Internals		Final CO Attainment**	
CO 3			71 (assumed)	3
CO 4			68 (assumed)	2
CO 5			77 (assumed)	3

Average of all values which are mapped with CO1 (Yellow high light)

** if Final Semester end exam carries 80% and internal exam carries 20%, then final CO attainment = (55*0.8) + (67.5*.2) and (55*0.8) + (75.4*0.2) and so on

5.13 PO attainment

Course Outcome code	Course outcome Statements	PO1	PO2	PO3	PO4	PO5	PO6
CO1	57.5	38.3	57.5	0.0	38.3	19.2	57.5
CO2	59.8	0.0	0.0	59.8	19.9	0.0	59.8
CO3	71.0	0.0	0.0	0.0	47.3	71.0	71.0
CO4	68.0	68.0	0.0	45.3	45.3	45.3	0.0
CO5	77.0	0.0	51.3	0.0	0.0	51.3	0.0
	Average	53.16	54.42	52.57	37.73	46.71	62.77
	Level of Attainment	1	1	1	0	0	2

6. REVIEW OF GUIDELINES

These guidelines will be reviewed periodically to rectify anomalies, (if any), and to incorporate feedback received from the stakeholders, through impact analysis and deliberations of the Focus Group, constituted by the Vice Chancellor.

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