ENGINEERS BOARD OF KENYA
Enhancing Professionalism

SELF ASSESSMENT REPORT

1. Organisation of the Higher Education Providers (Universities)

Outline the organisational structure of the University, including:

- **Title and name of Chief Executive Officer of the HEP**

  e.g. Vice Chancellor

- **Name of the principal academic entity responsible for engineering education hereinafter called the Faculty, names and relative sizes of comparable entities in other disciplines;**

  e.g. Faculty of Engineering

- **Title and name of the Head of the Faculty**

  e.g. Dean of Engineering

- **Title and name of person at corporate level to whom the Head of Department reports**

  e.g. Dean of Engineering

Provide evidence of the **HEP**'s long-term commitment to engineering as a discipline, for example through corporate mission statements and strategic plans, or otherwise.

Provide evidence of the **HEP**'s engagement in long-term planning processes (excerpts from the University's strategic plan would be welcomed).

Statement of whether the **HEP** has prime responsibility (subject to University approval processes) for programme design; programme content; programme delivery; management of resources; appointment and supervision of staff; and professional activities of staff (research, consulting, staff development).

2. Organisation of the Faculty

Describe the organisational structure of the Faculty including:

- **Titles and names of officers having responsibility across the Engineering Faculty**

  e.g. Dean, Faculty Registrar, etc.

- **Names of sub-entities and scope of their responsibilities**

  e.g. Department of Civil Engineering

- **Titles and names of the Heads of the sub-entities**

- **Accountabilities in relation to educational programmes and to staff supervision**

3. General Information on the Programme to be Accredited

- **Title of Department**

- **Name of Head of Department**

ENGINEERS BOARD OF KENYA
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Contact name / E-mail for visit if different from Head of Department

- **Address of Department**

  Tel :

  Fax :

  E-mail:

- **Staff Member(s) responsible for the submission**

  Name of main contact(s) for the Programme(s):

  Tel :

  Fax :

  E-mail:

- **Date of submission**

- **Visit date**

  (if not yet agreed, leave blank)

- **Names of current / most recent external examiners since the last accreditation**

  Include affiliation of examiners

- **Response to previous accreditation recommendations**

  Give the date of the last accreditation visit and your response to any conditions or recommendationsattached to the last accreditation and how you have dealt with them.

- **Programme development since last accreditation**

  Describe any major changes made to the Programme(s) since that date and give the date they wereimplemented.

  (Include changes such as conversion to modules and semesters)

  Date :

  Major Changes:

4. Programme Information

(A separate submission of Section is required for EACH programme for which accreditation is being sought but cross referencing of information should be used wherever possible)

- **(a) Title of programme as it appears on the Degree Certificate**

  Discipline as it appears on the transcript

A.3.4.1 (b) Type of programme and duration

Please give the date the course was first offered in its present form.

(i) Date of first implementation of the Programme _____

(ii) Date on which programme was first accredited _____

(iii) Is it a new programme? _____

(iv) Type of programme
Identify whether the course is full-time, part-time or sandwich, and if the latter, thick or thin. (complete all types for which accreditation is sought)

Full-time (F/T)	_____	(tick if appropriate)	_____
Minimum number of academic years	_____	Normal contact hours per year	_____

Part-time (P/T)	_____	(tick if appropriate)	_____
Minimum number of academic years	_____	Maximum number of academic years	_____
		Minimum contact hours per year	_____

Sandwich (S)	_____	(tick if appropriate)	_____
Minimum number of years	_____	Type of sandwich (state Thick/Thin)	_____

State the year(s) in which industrial experience takes place _____

- **(c) From which Professional Institution(s) is accreditation being sought?**

  (i) EBK

- **Mission, Objectives and Outcomes of the engineering degree programme – BSc /BEng**

  State the mission and the programme objectives and relate how the programme objectives and programmeoutcome are consistent with **WA** criteria on graduate abilities

- **Programme Structure**

Provide a diagram for the programme structure for each mode of delivery, clearly showing core and optionalsubjects, and all possible routes through the overall programme.

- **Complete Table 1, in the format given below for the study programme**

Table 1 - Content of the academic programme

Module Group	Module Code	Credit Value	Credit distribution among different categories										Total Credit Values of Compulsory Modules	Total Compulsory Credit Value of Elective Modules (basket wise)
			Math, Basic Sciencesand Computing			Engineering Sciencesand Engineering Design		Complementary Studies						
			Mathematics	Basic Sciences	Computing	Eng. Design and Project	Eng. Discipline Specialization	Management	Eng. Economics	Communications	Humanities and Social Sciences	Engineering Ethics		
Compulsory Modules														
Elective Modules (Basket wise*)														
Total Credit Value														

- **Table 2: Mapping of LO-PO for each Module**

Use PO achievement levels H, M and L as depicted below. (guidance is given in Appendix)

H – High M – Medium L – Low

ILOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO1	H	H		M			L			M		L
LO2	H	M	L	M	L	H		L		M	M	L
LO3	M											

LO4	M		H		H			L		L		
Module	H	M	M	M	L	L	L	L		M	L	L

- Table 3: Mapping for the full Programme

Table 3 - Mapping for the full programme

Module		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
M1					M			L			M		L
M2		H	M	L	M	H	H		L		M	M	L
M3		M											
M4		M		H		H			L		L		
Semester 1 Total	H												
	M												
	L												
M1		H			M			L			M		L
M2		H		L	M	H	H		L		M	M	L
M3		M											
M4		M		H		H			L		L		
Semester 2 Total	H												
	M												
	L												
M1		H			M						M		L
M2		H		L	M	H	H		L		M	M	L
M3		M											
M4		M		H		H			L		L		
M9		H											
Semester 3 Total	H												
	M												
	L												

M1	H	M	L	L

Table 3 - Mapping for the full programme

Module		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
M2		H		L	M	H	H		L		M	M	L
M3		M								M			
M4		M		H		H					L		
Semester 4 Total	H												
	M												
	L												
M1		H	H					L			M		L
M2		H	M	L		H	H		L		M	M	L
M3		M											
M4		M		H					L		L		
Semester 5 Total	H												
	M												
	L												
M1			H		M			L			M		L
M2		H				H	H		L		M	M	L
M3		M											
M4		M		H					L		L		
Semester 6 Total	H												
	M												
	L												
M1		H	H		M			L			M		M
M2		H	M	L	M	H	H		L		M	M	L

M3	M					L						
M4	M		H		M			L		L		

Table 3 - Mapping for the full programme

Module		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Semester 7 Total	H												
	M												
	L												
M1		H	H		M						M		L
M2		H	M	L	M	H			L		M	M	L
M3		M								M			
M4		M		M		H			L		M		
Semester 8 Total	H												
	M												
	L												
Programme Total	H												
	M												
	L												

5. Programme Content

A separate submission is required for EACH programme and for EACH year for which accreditation is being sought, however, please cross-reference informationwhenever possible.

- **Curriculum**

Degree:_____ **Year:** _____

Subject (indicate core,or elective, or optional)	Timetabled work in hours per week						No. of teachin gweeks	Total hour s	No. of Credits	Assessment (%)				
	Lectures	Tutorials	Lab work	Projects/ Presentations	Guided self-study	Others (pleas e specify)				End semest erexam	In-class assessme nt	Off-class assessme nt	Projects/ presentations	Laboratory assessment

- **Syllabus / Module Descriptors**

Copies of syllabi, Module Descriptors and the relevant book list for each year of the degree should be provided (five copies). The descriptors should show the pre-requisites and co-requisites.

Following Module Descriptors should be included:

(a) module code and name
(b) credit rating
(c) pre-requisites
(d) co-requisites
(e) lecture time allocations of delivery
(f) tutorial time allocations of delivery
(g) laboratory time allocations of delivery
(h) intended learning outcomes (LO)
(i) content outline
(j) recommended references
(k) assessment modes with relevant weightages for each LO

This must include the links between the programme outcomes and the module outcomes as shown by the module assessment. An explicit mapping must be provided showing how the generic attributes are embedded into the programme.

- **(a) Final Year Projects - Major Individual Project**

Outline the arrangements for project allocation, supervision, marking and moderation. A list of final year project titles and marks, together with mean and standard deviation, should be given for the most recent year available. What arethe implications for a student who fails a final year project?

- **(b) Comprehensive Design Projects - Group Projects**

Provide details of the Comprehensive Design Projects. State the average number of students in each group and showthe marking arrangements for individual assessments. Also, outline the arrangements for project allocation, supervision and moderation. A list of Comprehensive Design Project titles and marks, together with mean and standard deviation, should be given for the most recent year available.

What are the implications for a student who fails a comprehensive design project?

- **Design**

State how the concepts of engineering design are introduced into the programme and outline the sequence of design exercises and individual / group projects, including any design-make-test work and how the design is assessed.

- **Non-technical Subjects**

Describe the opportunities offered for the study of non-technical subjects, such as business and social aspects of engineering, including law, humanities, finance, management development, health and safety, environmental responsibilities, foreign languages and any other complementary subjects, and give details of the assessment methods.

- **Communication Skills of Students**

Describe briefly how the following skills are developed and assessed:

(a) standard of English used in written work
(b) oral communication skills
(c) drawing and sketching abilities or other relevant forms of visual communications, including use of computer-aided-design
(d) group working skills
(e) engineering problem-solving skills
(f) project management skills

- **Industrial Visits, Industry Speakers and/or Field Courses**

Give brief details of industrial visits and/or field courses (particularly, residential field courses) or any other provisionby the University for students to obtain relevant experience off the campus. How do these experiences contribute tothe degree result? Give the names of staff members responsible.

Provide details of all presentations by industry specialists in the programme, and where in the programme structurethese experiences are provided, for the last twelve months.

- **Industrial Training Placements / Experiences**

(a) **Sandwich Programme**
Give brief details of industrial training and placements, how these are monitored and the names of staff members responsible. Does the industrial training or the sandwich year contribute to the degree result? How is this industrial training and placement assessed?

(b) **Full-time Programme**

(i) Is there a compulsory element in the full-time programme for students to undertake an industrial placementor gain industrial experience?

(ii) If not, how many students have not had any experience on graduation? Give the figures for the last threegraduating years.

Industrial Experience - Full-time Programme	20___	20___	20___
Number of students on full-time programme who havenot had any industrial experience			
Total number of students graduating from full-time programme(s)			

(c) How many students in the last three graduating years have been sponsored (Scholarships)?

Sponsored Students	20___	20___	20___

- **Industrial Consultative Panel (ICP)**

Please state membership, when it was established and how frequently the committee meets

(a) Provide the agenda and minutes of the previous five meetings
(b) Show how Industrialists contribute to programme design and content development
(c) Outline the industrial input to the delivery of the programme(s)

Give details of Visiting Industrial Lecturers and state whether attendance is compulsory.

- **Period of Study Overseas**

Give brief details of any period of time spent overseas, indicating the length of time spent abroad and in which institution. Outline the arrangements to ensure that the study is compatible with that in the home University, and show how it is assessed. Does this period contribute to the degree result?

- **Tutorials**

Give brief details of tutorial arrangements including purposes of the tutorial system (e.g. subject, overall academic review, pastoral, practical, etc.). State the size of tutorial groups, student-staff contact hours etc.

- **Inter-departmental Teaching, External Teaching/Lectures**

(a) State which subjects are taught by the staff from other departments or other institutions, and give brief details of any franchise arrangements. Give brief details of the arrangements for assessment.

(b) Give details of any lectures delivered off campus.

6. Entry Standards/Admission requirements

- **Published Requirements**

Give the published entry qualifications requirement

- **Student Entry Qualifications**

(a) Please give, for each of the last three years, the actual qualifications and subjects of each student admitted toeach programme. Give details of the qualifications offered by overseas students. (This information may be given as an annexure)

(b) Please provide, for each of the last three years, a histogram of the entry points score for `A' Levels and Diploma holders

- **Selection Procedures**

(a) Describe briefly the procedures adopted for admitting potential students. State whether all students are interviewed, and give the policy adopted for overseas applicants

(b) Please indicate the following for each of the past three years' entries

	20 ___	20 ___	20 ___
1. Total number of applicants			
2. Number of Students interviewed			
3. Offers made			
4. Planned intake			
5. Actual intake			

7. Progression and Classification

- **Progress through the programme**

Please complete a flow diagram showing the last three complete cohorts through the system and a separate sheet forthe last three intake years if these are different. Show clearly the progress of students through the programme for each option:

(a) direct entrants

(b) re-sit numbers from previous years

(c) failures (classified, if possible, as for academic or non-academic reasons)

(see student progress)

- **Methods of Assessment**

(a) Give details of the programme assessment/examination procedures/systems including the relevant weighting for examinations, projects and other coursework and the weighting for each year's results

(b) Give details of pass marks, grades and any provision for compensation, together with referral procedures and opportunities to re-sit examinations. What are the arrangements for resubmitting coursework and project

work?

(c) What are the conditions governing progression from one year to the next?

(d) In percentage terms, what is deemed to constitute a pass, and to what extent can marginal cases be condoned /retrieved?

(e) If a grading system is used, give the percentage marks that determine the Grades?

(f) State the criteria for the award of Classes; e.g. predetermined percentages of candidates, predeterminedboundaries as percentage marks, performance criteria for individually assessed items.

8. Student Membership Status and Destination

- **Professional Membership**

(a) Explain how students are introduced to their relevant Professional Institutions

(b) What proportion of the cohorts are members of Professional Institutions or Societies?

20 ___			20 ___			20 ___		
Inst./Soc.	Number	Present	Inst./Soc.	Number	Present	Inst./Soc.	Number	Present

- **Departmental Staff/Student Committee**

Please provide details, and state how often the Departmental Staff/Student Committee meets. Provide minutes of theprevious five meetings.

- **Destination of Graduates**

Please indicate the employment category of the graduates for each of the last three years.

	20 ___	20 ___	20 ___
1. Permanent employment in engineering, computer scienceor occupations relevant to the degree programme			
2. Commercial, financial, non-engineering employment			
3. Research / further study			
4. Unemployed / temporary work			
5. Returned to own country			
6. Not known			
Total number in the cohort			

9. Staff

- **Teaching and Research Staff**

Please provide the details shown below for each member of the academic staff and visiting industrial lecturer involved in the programme.Ensure that details of all industrial experience are provided.
This information may be presented in any format suitable to the Department provided that it is brief and addresses all the requirements.Under 'Research' the columns refer to:

(a) the number of research students currently supervised
(b) the number of refereed research papers published in the last five years
(c) the number of current consultants

Name	Presen tpost	Date of joining **HEP**	EPF No. / Pensio nNo.	Category*	Period out onsabbatical leave during last 5 years (Applicable only for Category A)	Period servingon sabbatical leave during last 5 years (Applicable only for Category E)	Period servingon contract during last 5 years (Applicable only for Category F)	Academic Qualifications	Membershi pof Professiona lBodies or Societies	Profession alDuties (eg External Examiner)	Brief resume (with approx. dates of industrial experience incl. any current activities)	Present teaching Subject(s)		Research		
												Modul e Name / Code	Studen t contact hours per year	a**	b**	c**

*Please indicate the category in the mentioned letter as
follows:Full time active staff -- A
Part time -- B
Full time active staff from other programmes in the institution --
CFull time staff on sabbatical leave -- D
Staff serving during sabbatical leave from other institution -- E
Full time contract staff -- F

a** = Number of research students currently supervised
b** = Number of referred research papers published in the last five
yearsc** = Number of current consultancies

- **Summary of Professional Qualifications of Teaching and Research Staff**

The total number only for each Institution or Society is required

Institution / Society	Chartered Engineers	Graduate Engineers	Incorporated Engineers

- **Staff Development Policy including Continuing Professional Development (CPD) Requirements / Achievements**

(a) Brief details of Policy

(b) Please specify funding details for staff training / development

(c) Give examples of staff attendance at conferences and seminars (in the past two years)

(d) What is the take-up of staff development opportunities?

(e) Are all staff eligible, or, is staff training / development confined mainly to new members?

- **Student / Staff Ratio**

(a) Give the departmental equivalent full-time staff / student ratio based on full-time equivalent staff involved indelivering the programme and students. Department full-time staff, staff teaching support subjects from otherdepartments and industry/sessional/part-time staff must be clearly distinguished.

	Equivalent Full Time Academic Staff to Student Ratio	Total Equivalent	Description
A	Total number of full-time active staff for undergraduate teaching into this programme. *(Note: this does not include staff on study leave or re-search only staff. For staff on sabbatical leave, 0.1 deduction should be made per member for each year of leave falling within the 5-year period considered for accreditation)*		Provide evidence of pension scheme of each member
B	Full-time equivalent of academic staff serving whileon sabbatical leave, or contract basis		0.2 contribution per member per year within the 5-year period considered for accreditation
C	Full-time equivalent of academic staff from other programmes serving this programme		0.2 contribution per year for teaching at least one full module in each semester (Pro-rata, if not)
D	Full-time equivalent of part-time academic staff serving this programme		0.2 contribution per year for teaching at least one full module in each semester within the 5-year period considered for accreditation. (Pro-rata, if not). (Claim from this category is limited to 10% of the total full-time equivalent staff)
E	Total Full-time equivalent academic staff $= A + B + C + D$		
F	Total Full-time equivalent students		
G	Full-time equivalent staff to student ratio $= E : F$		When an academic department offers more than one-degree programme, and when the staff cannot be uniquely identified to individual degree programme, the staff: student ratio must be computed with respect to the entire student population in the department and the entire number of equivalent full-time academic staff in the department.

- **Support / Technical Staff**

(a) Please give the technical staff / full-time academic staff ratio for the Department.

(b) Explain clearly how this figure is derived

(c) Give details of all relevant technical staff, differentiating between permanent (P) and short-term research supportstaff (R). In a large department, a summary by grade will suffice

Name	Qualifications

10. Research, Consultancy and Postgraduate Programmes

- **Research**

Give details of the research work carried out within the Department during the last three years. The details should include:

(i) the title and focus of the project

(ii) the value and period of the project

(iii) the way research influences teaching and student work

- **Consultancy**

Give details of the consultancy work carried out within the Department during the last three years. Details should include:

(i) examples of clients

(ii) the total value

(iii) the way consultancy work influences teaching and student work

- **Postgraduate Programmes and Short Courses**

Give details of related postgraduate programmes and in-career courses offered by the Department, including the number and duration of courses and the total number of students on each course, for the past three years.

11. Resources

- **Facilities**

Give briefly, details of the resources, which are available to students, in each of the areas designated, and any changes since the last visit. Indicate how many students can be accommodated in laboratories/workshops, design/drawing facilities, library and computer facilities at any one time. What facilities are available for students for their final yearprojects and comprehensive design projects.

Resources – Provide brief details	**Access** (availability other than for timetabled work i.e. evenings, week-ends)
Laboratories / Workshops	
Details of annual expenditure on equipment or major expenditure on laboratories / workshops Explain how the laboratory equipment is being upgraded in a systematic way.	
Drawing / Design Facilities	
Provide details of annual expenditure on equipment or major expenditure on drawing / design facilities.	
Library	
Please give details of annual expenditure on: (a) journals (b) books (c) other Give details of the online journals that students and staff can access.	
Computing Facilities	
State (a) number of computers within the Department (b) number of computers within the University to which students have access (c) how often is equipment replaced? (d) specialist software available to students and staff	

Resources – Provide brief details (include details of what facilities are available in these rooms, i.e. computers, overhead projectors, data projectors etc.)	**Access** (availability other than for timetabled work i.e. evenings, week-ends)
Study Rooms	
Lecture Rooms	

Details of Space of Facilities

Space of Laboratories

Laboratory	Number of lab-sessionsper batch	Number of students perlab-session	Floor area in square meters (m^2)
Total			

A session to be minimum of 2 hours duration

Teaching and other student spaces

Facility	Usage description such as lecture hall, examination hall, study area, library, restrooms, circulation space etc.	Number of students occupied by the facility at a time	Floor area in square meters (m^2)
Total			

In the case of common facilities with other programmes the effective space shall be calculated based on studentnumbers (the student number of programme applied/Total number of students of the Faculty)

(** Generally, the world universities maintain an approximate space of 10 m^2 per student.)

- **Financial Resources to Support the Teaching Programme**

Please give figures for the last five years

Income	20 ___	20 ___	20 ___	20 ___	20 ___
Government					
Research / Consultancy					
Other					
Total					

- **Resource Changes**

Please state anything distinctive or unusual about the resources for the programme - e.g. new or refurbishedaccommodation or major equipment, shortage of space or difficulties over sharing space.

12. Quality Assurance (QA) and Systems

(i) Give a brief statement on teaching quality assurance procedures within the Department and state how they relateto the institutional QA requirements. Include information on

(a) maintenance and improvement of standards of lectures and other modes of teaching and learning, assessment and examinations;

(b) program review procedure;

(c) moderation of examinations, students' work, including monitoring and feedback;

(d) the role of the External Reviewer

(ii) Provide records of the examination, curriculum development or other meetings as evidence on how QAprocedures have been developed and the action taken by the Department to implement QA procedures.

(iii) Provide in digital form the QA policies for the above procedures.

(iv) Provide External Reviewer's report

(v) Provide details of benchmarking the programme against those of overseas universities.

13. Future Plans

- **Planned Changes**

Give details of any major changes planned or intended in the programme structure or content, facilities, equipment,staff or student intake. What are the implementation dates?

(Frequency of Changes to the curriculum that are agreed as per department policy and to be implemented within theperiod for which accreditation is being sought should be indicated)

14. Staff Profile

Provide a listing of all academic staff who teach in the Faculty of Engineering, indicating their qualifications (degrees, professional memberships, honours and other post nominal). Include adjunct staff, and visiting or part-time staff who have principal responsibility for subjects. For the adjunct and visiting staff, give the titles of their substantive appointments.

Indicate numbers of visiting staff who perform supporting roles (i.e., do not have principal responsibility for subjects) and typical occupational categories e.g., practising engineers, other professionals, research students.

Discuss the competency of the teaching staff to cover all areas of the curriculum, and indicate any strategiesfor reinforcing areas of weakness, staffing new areas of specialisation, and succession planning for academic and organisational leadership.

Provide information about other units of the University, which teach subjects in the engineering programme(s), and about any staff outside the University who have responsibility for substantial elements of the engineering programme(s).

For any programme or pathway conducted substantially outside the University (e.g., contracted to another university,or remote campus with different staff), describe the staffing arrangements that apply, and the methods used by the University to assure itself of the capabilities of the staff involved.

15. Staff Policy

Outline the University/Faculty policies in relation to staff, including:

- appointment;
- promotion;
- supervision and staff counselling;
- appointment, supervision and counselling of visiting staff;
- professional development of staff; and
- any merit-based reward systems

Describe the University's arrangements for managing staff workloads indicating the approximate proportions of academic staff activity devoted to undergraduate teaching, postgraduate teaching, student consultation and counselling, research and research supervision, consulting and other professional activity, developmental programmes and administration.

Provide information about the number of staff undertaking professional development programmes, and the range ofprogrammes undertaken.

Appendix 1

Learning Outcomes should be written in the Module Outlines using the action verbs following (Structure of Observed Learning Outcomes) **SOLO** Taxonomy or **Bloom's** Taxonomy. The descriptions below are for the **SOLO** taxonomy, which is recognized as being more suitedfor engineering programmes. However, action verbs from **Bloom's** taxonomy can also be used. These action verbs are not exhaustive, and verbs consistent with the appropriate Level & Description can be used - it is the Description that is more important. Note that the verbs used to describe the Graduate Attributes bear NO relation to the verbs used in the taxonomy below. It may be more helpful to use the labels (in **bold** characters), and ensure that they are delivered at increasingly higher levels through the program.

Table A1: Some descriptions and action verbs in the assessment according to **SOLO** taxonomy

Level	Description	Typical Action Verbs used in the Assessments
1	Uni-structural (**single aspect** of a problem)	Memorize, Identify, Recognize, Count, Define, Draw, Find, Label, Match, Name, Quote, Recall,Recite, Order, Tell, Write, Imitate
2	Multi-structural (**several aspects** of a problem considered independently)	Classify, Describe, List, Report, Discuss, Illustrate,Select, Narrate, Compute, Sequence, Outline, Separate
3	Relational (**several aspects** of a problem and how they **relate** to each other to form a coherent problem **structure**)	Apply, Integrate, Analyze, Explain, Predict, Conclude, summarize (précis), Review, Argue, Transfer, Plan, Characterize, Paraphrase, Solve (a problem), Compare, Contrast, Differentiate, Organize, Debate, Make a case, Construct, Review,Examine
4	Extended Abstract (**generalize** the problem**structure** and **abstract** it to a higher-level concept; OR perceive the structure from **different perspectives**; OR **extend** ideas tonew areas)	Design, Theorize, Hypothesize, Generalize, Rearrange, Generate, Create, Compose, Invent, Devise, Originate, make an original case, solve novel problem from first principles, Interpret, Contextualize, Assess, Recommend, Extrapolate, Critique, Translate

Notes:

1. Only those Learning Outcomes that are assessed by take home tests, marked assignments (group or individual), examinations, reports or other form of assessment will be considered as contributing to the Module Outcomes (MOs) and Program Outcomes (POs). Knowledge that is imparted without adequate assessment of the Learning Outcomes (LOs) cannot be considered, as there is no indication that the student has acquired the expected outcome.

2. Ideally there should be no more than 5 or 6 ILOs for a one semester module. Module Outlines should also give the Assessments for each Learning Outcome, and the assessments should be described using the action verbs according to the **SOLO** or **Bloom's** taxonomy. These then give the level of assessments for the LO's, with higher orders in the Taxonomy corresponding with higher levels of Assessment.

3. The LO-PO mapping of the individual modules is done by the individual lecturer in charge of the Module, or the Module coordinator, as he/she has detailed knowledge of the module. The (H, M, L) in the LO-PO matrix should correspond to the Taxonomy level of assessment of each LO.

4. Thus, for the LO-PO Matrix (NT2 Table), for each Module, if the LO is assessed at
   - SOLO Level 4, contribution to the PO → H
   - SOLO Level 3, contribution to the PO → M
   - SOLO Level 1 and/or 2, contribution to the PO → L

If **Bloom's** taxonomy is used, this approximate conversion can be employed:

- Bloom's Level 5 and 6, contribution to the PO → H
- Bloom's Level 3 and 4, contribution to the PO → M
- Bloom's Level 1 and 2, contribution to the PO → L

The overall contribution from the module to the PO must be derived from the individual contributions from the LOs. (Note: even the highest level of contribution (H, M, L) towards a PO from a set of LOs can be transferred to the NT3 Tables, provided that LO has a significant assessment associated with it.)

N.B.1: All Modules should not be contributing to all PO's, except perhaps the Comprehensive Design Project or Capstone Project.

N.B.2: Whatever the action verbs used in the LOs, assigning of a PO achievement level of H should be minimizedin early semesters of the program.

5. The MO-PO Matrix (Table A1) is prepared by combining the last rows of all CORE Modules in the programme, in the order that a student would be normally taking these modules in the program (Semester by Semester or Year by Year). Survey or field camps, industrial training or industry internships that are CORE Modules that are assessed for Learning Outcomes should be included. Please note that Elective Modules should be excluded from this matrix, unless it can be established that all the elective modules make the identical contribution to the Program Outcomes, in whatever combination they are taken. This means that all modules in every basket of electives should have common LO-PO mappings -- if necessary, by using the ''lowest common level'' for each POfrom all the electives in the basket. Optional modules should not be included in the Table.

6. After making the MO-PO Matrix, please make sure that
   (a) Sufficient number H's (e.g. a minimum of 2 or 3) in the later years in the programme for each PO, i.e. the PO's are assessed at a higher level of knowledge/understanding/skill/ability as the student progressesthrough the programme.
   (b) There is a proper scaffolding for the Hs with Ms and Ls in the earlier years of the programme (Minimum of2 to 3 each of Ms and Ls for each PO).

7. If there are any gaps in the Matrix, i.e. the requirements as given above are not satisfied, the staff must review the program together to identify how the gaps can be filled by improving the assessments in the modules. Often it will need some adjustments in the assessments, to elicit the higher-level learning outcomes from the students. These changes should be recorded, and the documentation should include when the changes were made; and the corresponding module outlines and students' assessment collection be available for review.

8. Please note that the Curriculum Mapping, Module Outlines/ Details, and the Assessment Collection are the proof of delivery of the PO's, and there should be consistency among these.

9. Note also that the POs should also be aligned to the Programme Educational Objectives, which should be defined by each **HEP**.

10. Note that the table A1 above is an indication of what the **HEP** plans to deliver. However, every attempt should bemade to track and document what each student has achieved (with an appropriate pass mark) throughout the program with respect to each PO.