



## **EAB PROCEDURE AND ACCESS TO PREMISES AND DOCUMENTS**

The Evaluation Team will evaluate the information and evidence supplied in this Report against each of EAB published Criteria, viz. CRITERION-1: Programme Educational Objectives and Programme Structure, CRITERION-2: The Assessment of Graduate Attributes and the Assessment System, CRITERION-3: The Teaching and Learning, and the Quality Assurance Process, and CRITERION-4: Resourcing and Sustainability, as spelt out in the following EAB documents:

- (i) EAB-A12 (Self Study Submission Documentation), and EAB-A13 (Forms and tables),
- (ii) EAB-A03 (Accreditation Criteria for an Engineering Degree meeting the Educational Requirements for Registration with the Council of Registered Professional Engineers (CRPE)
- (iii) EAB-A02: The BEng (Hons)/BSc (Eng.) Engineering Degree Standard.

The EAB Visit Team and the Accreditation Committee of the EAB will proceed to conduct the evaluation according to:

- (i) the procedure outlined in document EAB-A11, and
- (ii) will submit its Report on its evaluation of the compliance of the programme with each CRITERION and sub-CRITERIA and make recommendations to the EAB through the Accreditation Committee, as per the requirements of document EAB-A14 and in accordance with the published procedure..

## **ACCESS TO PREMISES AND DOCUMENTS**

The HEI agrees to grant the EAB Visit Teams access to such lecture rooms, and other facilities for undertaking the evaluation of the programme(s) requested by the HEI, and to inspect, consult and procure copies of such documents and other records associated with the delivery and quality assurance of the programme and to meet and interview stakeholders who can contribute to the EAB Team's evaluation, in respect of which/whom EAB gave advance notice to the HEI.

The use of any document and records supplied to EAB and its Visit Teams and any information obtained by EAB during the course of any evaluation assignment is subject to the Confidentiality Agreement signed by members of the EAB and the Visit Teams involved.

< University >  
[<PROGRAMME NAME>]

# **SELF-STUDY REPORT**

## **PART-2**

### **Head of Department Self-Study Report**

**In Compliance with Requirements of EAB document**

**EAB-A12-P**

**[ Sections 6 & 7 ]**

## **CONTENTS OF THIS REPORT**

**About this Form**

**EAB Procedures and Access to the Institution's premises and documents**

**Instructions for completing this Form**

**Definitions**

**Content Instruction Level**

**Accreditation Credit Units**

**Guidance on Information Required (Table)**

**SECTION A: Institutional Information**

**A1 General Information**

**A2 Programme offered for Evaluation**

**A2.1 Programme Options (if any) for this Qualification**

**A3. Programme History and Pathways to Obtain this Qualification**

**A4. The Accreditation Criteria**

**A5. Follow-up on previous visit (if applicable)**

**A6 Plans for Changes**

**A6.1 Changes currently under consideration**

**A7 Background Information on the HEI**

**SECTION B: CRITERIA-1 : Programme Educational Objectives and Programme Structure**

**B1 The Programme Educational Objectives(PEOs) for this programme**

**B1.1 PEOs consistency with HEI and Dept's Mission/Vision/Objectives**

**B1.2 How the PEOs meet the needs of the programme's Constituencies**

**B1.3 Review & Updating of PEOs**

**B1.4 The Programme Outcomes(PO) (i.e Graduate Attributes GAs)**

**B1.5 The Programme Outcomes(PO) [ If different from EAB Graduate Attributes]**

**B2 Programme Structure**

**B2. 1 Guidance on compiling data on Programme Structure**

**B3. Credits and Knowledge Areas**

**B4 The Core of the Programme**

**B5 The Specialist Module/Modules**

**B6 The Rules for constructing the Curricula**

**B7 CRITERIA for Credits, Reassessment, Repeat, Progression, Graduation, and Exclusion**

**B7.1 Methods of Assessment**

**B7.2 Projects**

**B7.3 Performance Descriptors**

**B7.4 Policy on Compensation and/or Condonement**

**B7.5 Rules for Progression and/or transfer from and to this programme**

**B7.6 Policy on Exit / Award**

**B7.7 Classification**

**B8 Module Specifications**

**B9 Engagement with Industry**

**B9.1 Industry Training**

**B9.2 The Industry Advisory Board**

**SECTION C: CRITERION-2 Assessment of Graduate Attributes and the Assessment System**

**C1 The Assessment System**

**< University >**  
**[<PROGRAMME NAME>]**

- C2 Mapping of Modules against Graduate Attributes**
- C3 Policies and Procedures to Validate Assessment of Graduate Attributes.**
- C4 Analysis of Strengths and Weaknesses of Assessment System**

**SECTION D: CRITERION-3 Teaching and Learning and the Quality Assurance System**

- D1 Students' Academic Development**
- D2 Teaching and Learning Methodology**
- D3 Academic Development Programmes**
- D4 Development of Independent learning**
- D5 Programme Coordination**
- D6 Formative Assessment**
- D7 Monitoring of Students' Progress**
- D8 Moderation of Assessment**
- D9 Role of Internal and External Moderators and External Examiners**
- D10 Quality Assurance**
- D11 Internal Checks and Balances**
- D12 Arrangements for Programme review and Development**
- D13 Throughput and Cohort Analysis**
- D14 Strengths and eaknesses of Teaching learning and Assessment System**

**SECTION E: Resourcing and Sustainability**

- E1 Students**
- E2 Policy on Exemption for Credits earned elsewhere**
- E3 Faculty/Department Teaching Capacity**
- E4 Arrangements for Academic Counselling of Students**
- E5 Staff**
- E6 Policy on Staff Recruitment, Development and Retention**
- E7 Research Profiles of Staff and Opportunities for Research**
- E8 Support Staff**
- E9 Teaching Load on Academic Staff**
- E10 Policy on Invited Speakers**
- E11 Opportunities for Staff to engage in Consultancy**
- E12 Engagement of Staff with Professional Institution Activities**
- E13 Authority over Programme**
- E14 Financial Resources**
- E15 Laboratories and Workshops**
- E16 Computing and Other facilities**
- E17 Safety Policy and Practices**
- E18 Special/Innovations**

**SECTION F: Impact of Programme**

**SECTION G: Tour of Facilities**

**SECTION H: Exhibits (Evidence) to be available to Evaluation Team during Visit.**

**Accompanying Documents:**



**INSTRUCTIONS for completing this Form**

1. You may expand or extend each Section as necessary to insert your responses, but you must keep your responses within an A4 size space, except for material which can conveniently be presented in an annexed Table, Appendix or Supplement, as appropriate, to the specific Sections of this Form.
2. You may cross-reference where necessary, and if convenient insert a summary of another section but avoid extensive duplications.
3. The shaded areas containing the statements/questions which should not be removed from the document.
4. All core information is provided in the relevant sections of the submission, unless indicated otherwise.
5. Check page numbering to ensure each page is numbered.
6. HoD must also ensure that the set of documents referred to in Section 3.1(ii) and Section 7 of Document EAB-A12: Self-Study Documentation Requirements are collected and made available on site for consultation by the Visit Team during its Visit to the Institution.  
**[VISIT DOCUMENTS]**
7. Every page must bear the university name (abridged if wordy) and programme reference in the Header. The Header is configured for this requirement.
8. Where You need to direct the Team’s attention to lengthy material which is already contained in the HoF/Dean’s submission (viz, PART-1), please insert a cross reference.
9. HoD must note that this Form requires a set of Data tables (from EAB-A13-P) to be uploaded with this Form. In the USB Drive keep all files in the same File Folder.
10. The Table of Contents must include the full list of Tables and Appendices referred to and appended with this Form.
11. **Should you wish to INSERT a Page-Break , Position Your Cursor where you want the Pge Break, Hit INSERT on the main Menu and Click on Insert-Page-Break.**
12. **Should you want to split the table into two separate tables at any point, Right CLICK on <Page Layout> in Blue (to the Right of <Table Design> then in the <Merge> grouph Hit on <Split Table>.**
13. To UNDO an action inadvertantly done, use Press CONTROL + Hit Z .

**DEFINITIONS**

**EVALUATION**

**Programme Educational Objective (PEO)**

One or more statement that describes the role and responsibility for which the graduates from the programme are being prepared. These are broad statements that describe the career and professional accomplishments for which the programme will prepare the graduates.

**Programme Outcome (PO)**

A set of statements spelling out what knowledge, understanding and attributes a student acquires as he progresses through the programme, and can demonstrate upon satisfactory completion of the programme, which, taken together, should represent an achievement level, *in the*

**< University >**  
**[<PROGRAMME NAME>]**

	<p><i>discipline of engineering to which the programme relates, substantially equivalent to that reflected by the Graduate Attributes defined by EAB. The EAB Graduate Attributes are generic statements.</i></p> <p>The statements serve as Indicators or descriptors of what students must do to be considered competent in the attribute; these are MEASURABLE and PRE-DETERMINED standards used to evaluate learning.</p>
<p><b>Programme Specific Outcomes</b></p>	<p>PSOs are statement that describe what students are expected to know and be able to do in a specialized area of discipline upon graduation from a programme. These statements, generally 2 to 4 in number, are specific to the particular programme, but beyond POs. Reference to Programme Specific Criteria relates to the requirements for engineering practice particular to a specialised area or .sub-discipline</p>
<p><b>Module Outcome</b>  <b>[Note: In this Form, the term Module is preferred to Course]</b></p>	<p>These are statements that describe the learning outcome of the individual modules taught as part of the programme. They are narrower statements that describe what students are expected to know, and are able to do at the end of each module . These relate to the skills, knowledge and behaviour that students acquire in their progress through the module.</p> <p>These are also referred to as Learning Outcomes or Course Outcomes.</p>
<p><b>Content Instructional Level:</b>  <u><a href="#">INSTRUCTION LEVEL</a></u></p>	
<p> </p>	
<p><b>Accreditation Credit Units</b></p> <p>The EAB Accreditation Unit (AU) is defined on the basis of 10 notional hours of study to a Unit, where the Notional Hours represents the Volume of study for an activity which is granted academic credit and for which the associated number of hours corresponds to the aggregate of actual contact time (in class) for that activity between the student and the faculty members, or the part-time lecturers as the case may be, responsible for delivering the programme, supplemented by the out of class time (in hours) the student puts in on his own. The total time for any lecture is accounted for by a Multiplier, where a Multiplier of 1 implies classroom time is sufficient. A Multiplier of 3 implies a total of 3 times the actual contact time, i.e an additional (out of classroom time) equivalent to two sessions.</p> <p><b>Note: when accounting for Laboratory or scheduled tutorial sessions one hour of laboratory or scheduled tutorial = 0.5 AU</b></p> <p>The examination time is accounted for separately.</p>	

**Guidance on Information required (References are to Sections in EAB-A12-P)**

**< University >**  
**[<PROGRAMME NAME>]**

Type of Evaluation	Self-Study: Sections of EAB-A12-P to be completed							
	6.1 Prog-ID	6.2 F/up prev	6.3 CRIT-1	Appendices: 6.3(8) & (9)	6.4 CRIT-2	6.5 CRIT-3	6.6 CRIT-4	7
Initial	*		*	*	*	*	*	
Initial -Simplified	*		*	-	-	-	-	
Desktop	*	+	*	*	*	*	*	6.1,2,3,8
<b>Key: *: Required, +: required for re-submission</b>								
Initial Evaluation	items identified in Table 1 must be addressed at the planning level at the very least.							
Interim Report	In this case , EAB will specify the scope of the required documentation.							
Provisional Evaluation	the documentation must address all issues, detailing the entire curriculum and plans or commitments for stages not yet implemented.							

<b>SECTION A: INSTITUTIONAL INFORMATION</b>	
<b>A1</b>	<b>General Information (Include telephone numbers and e-mail addresses)</b>
A1.1	Institution Name [Sn6.1(1)]
A1.2	Faculty/School Name [Sn6.1(2)]
A1.3	Qualification awarded on completion of programme and abbreviation [Sn6.1(3)]
A1.4	Name of Head of Department responsible for this programme.
A1.5	If a joint degree is to be evaluated, name the main discipline for which the HoD in (1.4) is responsible, and refer to item(9) for the associated engineering discipline.



**< University >**  
**[<PROGRAMME NAME>]**

A1.6	<b>Name of Person Responsible for Programme, if different from person in (A1.4) above [Sn 6.1(4)]</b>	
A1.7	<b>Name of Programme Coordinator</b>	
A1.8	<b>Name(s) of other Staff involved with this Report &amp; Designation</b>	
A1.9	<i>RE-for Joint Degree Programme: Provide hereunder particulars of HoD, Discipline and staff concerned with the associated Engineering Discipline.</i>	
A1.10	<b>Institution Address</b>	
A1.11	<b>Campus address where the programme is delivered (if different from above)</b>	
A1.12	<b>Scheduled Visit Dates for this programme</b>	

<b>A2</b> <b>Programme(*1) Offered for Evaluation in this Self Study Report</b> <u><b>EVALUATION</b></u>				
Abbreviation (Designation) (*2)	Programme Name (Course Title) (*3)	Mode & Duration (*4)	Previous Accreditation & Period (*5)	Intake year for present cohort / size of cohort (*6).
<b>NOTES on information to be entered in Section A2</b>				

**< University >**  
**[<PROGRAMME NAME>]**

- 1 *The Report should concern only one programme, except if Options are also reported on.*
- 2 *Designation of the degree as will appear on the degree certificates, e.g. BEng(Hons)*
- 3 *Name or Title of the engineering programme: viz., Electronics and Telecommunications, etc.*
- 4 *Delivery mode and duration, viz., FT(4-Yr), PT(6-Yr), or as appropriate, or if Sandwich programmes are approved, enter SW\* and append note on duration at University-Industry-University. For any other insert code and explain.*
- 5 *(i) If previously accredited, enter Month and Year of Accreditation and period of accreditation, viz. Dec 2020 (3-Yr).*  
*(ii) For an non-accredited programme but delivering graduates, enter month and year of Commencement of Programme for the cohort currently in their graduation year.*  
*(iii) For a new programme, or a programme which has run for two years and achieved 50% of its Accreditation Credit Units (ACU), enter the proposed or actual commencement academic year.*
- 6 *Insert the cohort size of the intake into the first year for the current programme or proposed cohort size and academic year (for a new programme). Include any students who may be transferring into the programme from other programmes in similar stage*

**A2.1 Programme Options (if any) for this Qualification**

*Highlight the difference between the main degree programme and this OPTION offered to students and the rationale for the options.*

**A3. PROGRAMME HISTORY and PATHWAYS to Obtain this Qualification  
Sn6.1(5)**

- (i)** Write a short history of the programme (development, start date, Year the programme commenced, when last revised, Number of students currently on the programme, as well as details of any title changes (including intake years for which titles apply).
- (ii)** Provide details of the published entry requirements for all programmes submitted for accreditation.

**< University >**  
**[<PROGRAMME NAME>]**

<p><b>(iii)</b> Identify all pathways by which students may obtain the qualification, as permitted under the HEI's regulations, as well as the articulation, franchise and transfer arrangements (if necessary, describe the pathways to the degree by means of a diagram).</p> <p><b>(iv)</b> If the programme(s) admits students with a wide range of evidenced ability levels and/or admits students directly into later years of the course, provide details of how these students are supported.</p>
<p><b>History</b></p>
<p><b>Pathways</b></p>
<p><b>Academic Support</b></p>

<b>A4. ADDRESSING THE ACCREDITATION CRITERIA [Sn 6.1 (6)]</b>		
	<p><b>Provide details as required in EAB-A12 Sections 6.3, 6.4, 6.5 and 6.6 respectively as per format hereafter, or if applicable, summarise any major changes that have occurred under each heading since the last accreditation visit, giving dates of implementation and cohorts of affected students</b></p>	<p><i>Where addressed in this Report Section</i></p>
<b>CRITERION-1</b>	<p><b>Programme Educational Objectives, and Programme Structure [Sn 6.3]</b></p>	

**< University >**  
**[<PROGRAMME NAME>]**

<b>CRITERION-2</b>	<b>Assessment of Graduate Attributes and the Assessment System[Sn 6.4]</b>	
<b>CRITERION-3</b>	<b>Teaching, Learning and Quality Assurance Processes [Sn 6.5]</b>	
<b>CRITERION-4</b>	<b>Resourcing and Sustainability [Sn6.6].</b>	

<b>A5. Follow-up on previous visit [Sn 6.2(1)(a) &amp; 6.2(2)]</b>		<b>1*</b>
Summarize the Deficiencies, or Concerns remaining from the most recent evaluation report. Describe the actions taken to address them, including effective dates of actions, if applicable. If this is an initial accreditation, it should be so indicated.		
Date of Previous Visit		
<b>Deficiencies</b>	<b>List Deficiencies identified during previous visit</b>	<b>** Where is the response in this Report</b>
<b>#1</b>		
<b>#2</b>		
<b>#3</b>		
	<i>RIGHT CLICK =&gt; &lt;INSERT&gt; &lt;INSERT ROWS ABOVE&gt; as required</i>	
<b>Concerns</b>	<b>List Concerns identified during previous visit</b>	<b>** Where is the response in this Report</b>
<b>#1</b>		
<b>#2</b>		
<b>#3</b>		

**< University >**  
**[<PROGRAMME NAME>]**

**\*1 Insert Interim Report/Interim Visit/Final Visit as appropriate**  
**\*\*2 INSERT "No Action" or "Partly" if issues not addressed yet, or partly addressed**  
**\*\*\*3 Right Click in Row #3 and INSERT Rows Below as required.**

**A6 PLANS for Changes [Sn 6.1(7)]**

**[Also see A6.1 and to PART-1 (Sn 1.5)] for Changes in hand**

	Describe plans for changes to the programme, outcomes, assessment, and resources that will come into effect during the next accreditation cycle. For every change, Identify the cohort of students that will graduate under each identified variant curriculum and the range of years over which graduates are expected. Please provide a finalised Action Plan which gives details of how previous conditions and recommendations have progressed; provide updates on any major changes to the department and/or programmes, since the last accreditation visit.	State Where response is located
#1		
#2		
#4		
#5		
<i>Right Click in Row above and INSERT rows as required.</i>		

**A6.1**

**CHANGES CURRENTLY under consideration [Sn 6.2(1)(b)]**

	A statement of major changes to the programme, which are unrelated to the additional deficiencies that must be made.	State Where response is located

**< University >**  
**[<PROGRAMME NAME>]**

<b>#1</b>		
<b>#2</b>		
<b>#3</b>		
	<b>INSERT ADDITIONL ROWS IF REQUIRED</b>	

**A7 Background Information on the HEI**

Please supply information, additional to that included in Head of Faculty's submission (Part-1), on the history of the Institution, its establishment, ownership, organisation structure, governance and accountability, funding sources and relative proportion, depth of involvement in tertiary education, research, student population, and the structure of its Faculty of Engineering along with milestones in engineering education.

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**< University >**  
**[<PROGRAMME NAME>]**

<b>B</b>	<b>CRITERIA-1 : Programme Educational Objectives and Programme Structure</b>
<b>B1</b>	<b>The Programme Educational Objectives(PEOs) for this programme [Sn 6.3(1), also Part-1 (Sn 1.75)]</b>
<b>Guidance: These are statements that define the purpose of the programme and are based on the needs of the programme’s constituencies, viz. students, industry, the faculty itself, and broadly describe what the graduates will most likely be engaged in after graduation and completion of their professional formation. PEOs should generally express expectations of the graduates continuing professional development and education, including their attitudes in the short term following their graduation.</b>	
#1	
#2	
#3	
#4	
<b>INSERT more Rows as required</b>	

<b>B1.1</b>	<b>PEOs consistency with HEI and Dept’s Mission/Vision/Objectives [Sn 6.3-1(i)] [See also Part-1 (Sn 1.75)]</b>
<b>Describe how the PEOs are consistent with the Faculty’s/Department’s Vision or Mission or Objectives. Cross Refer to Part-1 (Sn 1.75)if required and/or elaborate</b>	

**< University >**  
**[<PROGRAMME NAME>]**

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<b>B1.2</b>	<b>How the PEOs meet the needs of the programme's Constituencies</b>
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<b>Identify the programme's constituencies /stakeholders and State how the PEOs meet their needs. How frequently are they consulted? Is the process documented? Where? [ABET]</b>	
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<b>B1.3</b>	<b>Review &amp; Updating of PEOs</b>
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<b>Describe the process that periodically reviews the Programme Educational Objectives including how ALL of the programme's various constituencies are involved in this process. Describe how this process is systematically utilized to ensure that the program's educational objectives remain consistent with the institutional mission, the programme constituents' needs and these Criteria. [ABET] When will next review take place</b>	
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**< University >**  
**[<PROGRAMME NAME>]**


<b>B1.4</b>	<b>The Programme Outcomes(PO) (i.e Graduate Attributes GAs)</b> [Sn 6.3(1) (ii)]
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*In the table that follows, State the Programme Outcomes and show they are consistent with and contribute to achieving the Programme Educational Objectives.*

**Note-1:** If the programme has adopted the EAB Graduate Attributes then these will be the Programme Outcomes (POs), but should be read in the context of the engineering discipline to which the programme relates.

**Note-2:** Where the Programme Outcomes are differently expressed from EAB Graduate Attributes, then Section B1.5 must be completed.

**GUIDANCE:** Programme Outcomes (Learning Outcomes or Students' Outcomes) or Graduate Attributes are statements of the knowledge, understanding, skills and abilities (or attitudes) that a student acquires while progressing through the programme and is capable of demonstrating upon successful completion of the programme.

**Programme Outcomes should relate to addressing Complex Engineering Problems**

PO Ref	How Programme Outcomes Contribute to the PEOs	PEOs (#)
	<p>In these rows please type in all the Programme Outcomes to be achieved through the programme over its duration. For each PO that you enter in this Column,</p> <p>(i) INSERT, <b>in the PEO Column</b>, the Programme Educational Objective (PEO) No (from Section B1) to which the PO contributes.</p> <p>(ii) <b>In each row marked (*) explain this how the PO is consistent with the PEO</b></p>	
#1		
	*	

**< University >**  
**[<PROGRAMME NAME>]**

#2		
	*	
#3		
	*	
#4		
	*	
#5		
	*	
#6		
	*	
#7		
	*	
#8		
	*	
<b>Note</b>	<b><i>INSERT as many rows as are required to include all the Programme Outcomes. &lt;RIGHT CLICK&gt; in this row and Hit &lt;INSERT ROWS ABOVE&gt;</i></b>	

**< University >**  
**[<PROGRAMME NAME>]**

B1.5 The Programme Outcomes(PO) [ If different from EAB Graduate Map EAB GAs against POs [Sn 6.3(1) (iii)]			
<p>if the Programme Outcomes in Section B1.4 are different from the Graduate Attributes published by the EAB, then HoD must demonstrate by mapping the EAB's Graduate Attributes into the Programme Outcomes that each and every one of the Graduate Attributes specified by EAB has effectively been addressed by the HEI's Programme Outcomes.</p>			
EAB GAs	EAB Graduate Attributes <u>GRADUATE ATTRIBUTES</u> Indicate in the PO column, the PO Ref No that delivers the GA in this column.	P.Os from B1.4	Where is the GA fully addressed
GA1 Knowledge	Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialisation as specified in Knowledge Profiles WK1 to WK4 respectively to develop solutions to complex engineering problems. <u>KNOWLEDGE PROFILE PROFILE</u>		
GA2 Analysis	Identify, formulate, research literature and, analyse complex engineering problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences, with holistic considerations for sustainable development*. <u>Knowledge Profile</u> WK1 to WK4.		
GA3 Design	Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health, and safety, whole-life cost, net zero carbon as well as resource, cultural, societal and environmental considerations as required. <u>Knowledge Profile</u> WK5		
GA4 Investigations	Conduct investigations of complex engineering problems using research methods including research-based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions; <u>Knowledge Profile</u> WK8		
GA5 Tools	Create, select, and apply, and recognise limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems. <u>Knowledge Profile:</u> WK2 and WK6		
GA6 Practice	When solving complex engineering problems, analyze and evaluate sustainable development impacts* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment [*Represented by the 17 UN Sustainable Development Goals (UN-SDG)]. <u>Knowledge Profile</u> WK1, WK5, and WK7		
GA7 Ethics	Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion. <u>Knowledge Profile</u> WK9		
GA8 Team work	Function effectively as an individual, and as a member or leader in diverse teams and multi-disciplinary, face-to-face, remote and distributed settings. <u>Knowledge Profile:</u> WK9		

**< University >**  
**[<PROGRAMME NAME>]**

GA9 Communi- cations	Communicate effectively and inclusively 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, taking into account cultural, language, and learning differences.		
GA10 Project Mgmt-Fin	Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and multidisciplinary environments.		
GA11 Lifelong Learning	Recognise the need for, and have the preparation and ability for (i) independent and life-long learning, (ii) adaptability to new and emerging technologies and (iii) critical thinking in the broadest context of technological change.  <b>Knowledge Profile: WK8.</b>		
If not fully addressed state where any shortfall is addressed			

<b>B2</b>	<b>Programme Structure</b>
<p>Provide a description of the structure of the programme in terms of the courses/modules, including whether these are compulsory or elective, the credits allocated and the allocation to semesters or year of study. The structure of the curriculum includes the module code and title, total number of contact hours (lecture, tutorial and practical) and credits. In subsequent sections the programme curriculum grouping based on course components such as core, specialist areas, etc is to be covered (Please use Table 1 of document EAB-A13-P. [See Note in Next Row] Table 1 also provides for the contact and other activities associated with each course, that is, lectures, tutorials, laboratory assignments and other activities).</p> <p>Also describe the process that periodically documents and demonstrates how the programme curriculum is evolved taking into consideration need for accommodating additional Programme Outcomes and Program-Specific Outcomes..</p>	
<p><b>NOTE:</b> Table-1 is now split into WorkSheet &lt;Prog Data&gt; and NewTable1&gt;. Columns under Knowledge Areas have been removed from Table 1 and are now reinserted in NewTable 1.</p> <p>The EXCEL worksheets to be used are: [Prog Data], [NewTable 1] and [NewTable 1A] of EAB document EAB-A13-P, compiled as per guidance in Section B2.1 hereafter</p>	
(a) ANNEX EXCEL document EAB-A13-P Worksheet [Prog Data]	
(b) Brief description of Programme Structure	

## **B2. 1 Guidance on compiling data on Programme Structure**

### **Tables for submission of data on Programme Structure: Open XCEL Document EAB-A13-P Tables and Forms for Self-Study Submission**

- (i) Starting with Worksheet [Prog Data]:** You will enter in successive rows data on all the modules comprised in the programme, starting with Year-1 Semester-1. For Each Module enter as follows:
- Columns A & B: the Code, and the Module Name respectively;
  - Columns C & D: the Number of Lecture sessions taught/held, and the duration in hours (or fraction of an hour),
  - Columns G & H, similar data for the Tutorials
  - Columns K & L, similarly for the Practicals, and
  - Columns O & P, similarly and if applicable for other modes such as Virtual.
  - In Columns S & T, the actual number of hours spend separately on on Assignment and Assessment.
  - The Columns E, I, M, and Q should populate automatically, or else insert in each the product of the preceding two Columns (No of sessions and duration (n Hours).
  - Note that the Worksheet Prog Data contains provisions of computing sub-totals for each Semester and the totals for the Year as well as for all 4 years
- (ii) The WorkSheet [NewTable 1A]:** If the format for NewTable 1A is maintained and enough rows are provided for entering all the Modules typed in Sheet Prog Data, then EXCEL functions can be used to populate Columns A and B of NewTable 1A automatically.
- (iii) Once Columns A and B are populated, please type in the appropriate Multipliers for each mode of learning in the appropriate Columns: E.g., C: Multiplier for Lecture sessions, D: Multiplier for tutorials), E: Multiplier for Practicals, F: Multiplier under Other, and G (Multiplier for the Assessment (Examination) sessions).**
- (iv) Column H is provided to permit an explanation to be given for any mode of learning where it is deemed that students needs to undertake out of classroom learning to become fully conversant with the subject matter taught or knowledge acquired during classroom/laboratory sessions.**
- (v) Completion of entries in NewTable 1A should permit automatic population of all blank cells (viz. TNH rows in Worksheet Prog-Data. Please check and rectify as necessary.**

**CREDITS allocated to each Module, semester and programme**

- (i) Completion of Worksheet Prog Data permits Worksheet NewTable1 to be populated.**
- (ii) WorkSheet NewTable 1 brings up all the individual Total Notional Hours (TNH) from Prog Data worksheet and computes the Credits as per EAB system , that is:**

$$\text{Credit Units} = (\text{Aggregate TNH}) / 10$$

**You may INSERT a link to the EXCEL Document EAB-A13-P, or Else Embed the EXCEL document in this Report**

**< University >**  
**[<PROGRAMME NAME>]**

**B3. CREDITS under KNOWLEDGE AREAS [Sn6.3(3)]**

Submit an analysis of the programme content by knowledge areas in the format defined in Table 1 of document EAB-A13-P and supported by Table 1A.  
 Show that the programme has achieved the Minimum Prescribed Credit Units for each Knowledge Area

**GUIDANCE:**  
 Worksheet NewTable1 of EAB-A13-P displays the Credit Units allocated to every Module for the whole programme within Column J. From the nature of each of the Modules (viz. Mathematical Sciences, Natural Sciences, Engineering Science, Design and Synthesis or Complementary Studies, allocate the Module Credits to the appropriate Knowledge Areas in Columns K, L, M, N and P. If the programme included Work Integrated Learning (WIL) which was quality assured as required in EAB document EAB-A03: Accreditation Criteria, then Column Q can be used to reckon the allocated Credit Units under that heading. Sum up all the individual Columns K to P to get the Credit Units under each subhead; readjust the Units after reallocating the WIL credits against the relevant Knowledge Areas, if applicable, and justifying the reallocation.

**Analysis of Credits by Knowledge Areas**  
**[from Worksheet “NewTable 1” Columns K to P**

Knowledge Area	Minimum Credits	Programme Credits
Mathematical Sciences	56	
Natural Sciences	56	
Engineering Sciences	180	
Design and Synthesis	72	
Complementary Studies	56	
<b>Sub-TOTAL</b>	<b>420</b>	
<b>For Reallocation</b>	<b>≥ 140</b>	
<b>Total CREDITS</b>	<b>≥ 560</b>	

The figures in the Column “Minimum Credits” represent the EAB standard. The corresponding Programme Credits must not be lesser for an accredited programme.

**B4      The Core of the Programme**  
**[Sn 6.3(4)]**

Identify and describe the design of the core of the programme comprising mathematics, basic sciences and fundamental engineering sciences. List the modules constituting the core of the programme and explain the logic underlying the construction of the core and the arguments for its coherence must be presented. Its design must prepare students for a career as well as provide a viable platform for further studies and lifelong learning.

<b>Modules</b>	
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**Describe the Core of the programme**

**B5. The Specialist Module/Modules  
[Sn 6.3(5)]**

*Identify and List the modules making up the specialist study components of the programme. The objectives and rationale underlying the specialist components must be presented. While this requirement may be satisfied through either compulsory or elective credits, it must be shown how the coherent core enables development in a traditional discipline or in an emerging field.*

**B6. The Rules for constructing the Curricula  
[Sn 6.3(6)]**

*Describe the progression rules governing the requirements for constructing curricula, i.e. how curricula design ensures the learning activities associated with delivering attributes are organized in a progression from introductory level (I), through the developmental (D), to advanced application (A) level, and the award of the qualification, including explicitly stated articulation options into, out of and beyond the programme. Show how the curriculum is aligned with the Programme Educational Objectives. Also describe how students are prepared for a professional career and further studies in the discipline through the curriculum, and how the curriculum supports the achievement of Programme Outcomes.*

<b>B7. CRITERIA for Credits, Reassessment, Repeat, Progression, Graduation, and Exclusion. [Sn 6.3(7)]</b>
Provide a summary of the criteria for awarding credit, allowing re-assessment, allowing repeat courses/modules, progression of students from one year to the next, graduation and exclusion from the programme (Details of the assessment system must be summarised in Table 2 of EAB-A13-P).
<b>ANNEX Complete NewTable 2 of EAB-A13-P sn 6.3(7)</b> Kindly note the design of Table 1, 1A and 2 (or Table <Prog Data>, NewTable-1, NewTable-1A and NewTable-2) have identical Columns A and B. So Table 1, 1A and “ can be auto populated by EXCEL from Table Prog Data
<b>B7.1 Methods of Assessment</b>
(a) Describe the Methods of Assessment and indicate for each academic year how much of the programme is assessed through: <ul style="list-style-type: none"><li>• Written examinations</li><li>• End of Module tests</li><li>• Laboratory work and Assignments</li><li>• Capstone and Research Projects, and</li><li>• Use of Rubrics, and</li><li>• (if applicable for quality assured mode): Learning while on Industrial placements.</li></ul>
(b) Explain how assessment tools are used to assess the impact of course delivery / course content, and how laboratory and project work are contributing towards the attainment of the Module Outcomes and POs



**< University >**  
**[<PROGRAMME NAME>]**

If Rubric is used, explain where and how it is used.

- (c) What is the expected level of attainment for each of the student outcomes
- (d) Summaries of the results of the evaluation process and an analyse the extent to which each of the student outcomes is being attained
- (e) How the results are documented and maintained [NBA-ABET]

## **B7.2 PROJECTs**

### **Project Work**

- (a) Outline the arrangements for project selection, allocation, supervision,.
- (b) The arrangements for assessment, marking and moderation.
- (c) What is the average size of a group
- (d) How is the allocation of marks for individual input into group projects done.
- (e) How are the projects assessed.
- (f) When allocating Technical Investigative Projects explain the approach to Individual assignments as opposed to Groupwork.
- (g) What are the implications for a student who fails a project?
- (h) Include a list of the Capstone Project and the Research Oriented Project titles for the past 3 years.

## **B7.3 Performance Descriptors**

Describe the Institution Policy on the **Scales of descriptors of the performance levels students are expected to achieve for specific assessment indicators;**

typical examples are as follows:

[A/B/C/D/F]

[>80%/70-79%/60-69%/50-59%/<50%];

[acceptable/marginal/unacceptable];

[students have mastered.... /students can apply.... /students can describe.... /students know....]

etc.

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**B7.4 Policy on Compensation and/or Condonement**

Please explain the policy on compensation and/or condonement, and provide details of pass marks, together with referral procedures and eligibility to re-sit examinations.

- Please include a copy of the policy for re-sitting examinations
- Please detail the arrangements for resubmitting coursework and project work

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**B7.5 Rules for Progression and/or transfer from and to this programme**

Progression and / or transfer on undergraduate programmes:

- From one year to another for each of the programmes?
- From one programme to another?

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**B7.6 Policy on Exit / Award**

Please state the Institution's exit policy or award in place for non-completion of any modules of a degree programme.

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**B7.7 Classification**

State how the award of the degree is determined and details on pass/fail/distinction.

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## **B8. Module Specifications Sn 6.3(9)**

Compile and submit a separately, in a USB Flash Drive, as well as in a bound volume as an appendix (APPENDIX- ?) the following information and documentation:

For each Module

(a) a specification for each module of the curriculum, including industrial training/work-based learning schemes and service courses/modules, consisting of at least

- (i) module outcomes;
- (ii) detailed module (course) content (syllabus), including where applicable, a detailed laboratory experience where applicable;

[Please provide a brief statement of no more than 400 words which describes how the programmes provide students with appropriate laboratory work and hands-on experience of engineering applications in an engineering workshop environment.] [UK]

Additionally, please provide any handbooks for laboratory programmes, design & make exercises and workshop practice, etc. where available along with information of which modules the exercises contribute to and their weighting.[UK]

- (iii) graduate attributes where applicable;
- (iv) means by which the students are assessed against the outcomes; and
- (v) a list of prescribed books and other supporting material.

Such a set must also be issued to each student.

(b) The syllabi format should be consistent for each Module, and contain the following:

- (i) Department, Module Code and Module Name,
- (ii) Whether Compulsory or Optional (viz. Elective) Module,
- (iii) Prerequisites for taking this module,
- (iv) Textbook(s) and/or other support materials,
- (v) Class/laboratory schedule (number of sessions each week and duration of each session),
- (vi) Contribution of course to meeting the HEIs programme specific criteria,
- (vii) Relationship of course to Student Learning Outcomes,
- (viii) Person(s) who prepared this description and date of preparation.

## **B9. Engagement with Industry Sn6.3(9)-[IMechE UK]**

Describe how the Institution engages with the Industry with the view to improve the quality of the programme. Provide any records of industrial engagement relevant to the development of the programmes. Where the Department maintains a log of industrial engagement, please provide a copy of the log records since the previous accreditation visit.

**< University >**  
**[<PROGRAMME NAME>]**

**B9.1 Industrial Training [IMechE]**

Provide brief details of industrial placements and visits or any other provision by the Department for students to obtain relevant experience off campus for the past 3 years. How do these experiences contribute to the degree result?

If the placement contributes to the programme outcomes and/or the degree result, please provide evidence of the assessment.

Please state the number of students currently undertaking industrial experience.

Give the name of the staff member responsible.

**B9.2 The Industry Advisory Board (IAB) Sn 6.3(9)**

(a) Compile and submit another appendix (APPENDIX-2), containing information on:

(i) the composition of the Industry Advisory Committee [Names, affiliations, and professional titles]

(ii) The Terms of Reference of the IAB

(iv) Notes of meetings of the Committee to demonstrate industry participation in the development of the curriculum to ensure it is relevant and meets the needs of the industry, particularly in areas experiencing rapid changes.

(b) Describe the ways in which the IAB contributes to the support and development of the programmes. Show how the Department ensures the programmes are up to date and appropriate for the destination of student cohorts.

## **C. Assessment of Graduate Attributes, and the Assessment System (CRITERION-2) [Sn6.4]**

### **C.1 Assessment System**

Head of Department must supply evidence to permit Evaluation Team to ascertain that the assessment within the programme:

- (1) ensures that all graduates satisfy each of the eleven graduate attributes (defined in the EAB standard)?
- (2) uses a documented set of assessment criteria and processes that together demonstrate that the graduate attributes are satisfied at the level indicated by the range statement?

INFO: Click HERE for [Range of Problem Solving](#)

Click HERE for [Range of Activities.](#)

Click HERE for [Knowledge and Attitude Profiles](#)

- (a) Explain how the assessment system (criteria and processes) ensures that Graduate Attributes are satisfied at the level indicated by the range statement.
- (b) How does the programme evaluates the extent to which the student outcomes are being attained. Each graduate attribute specified in the standard EAB-A02-P, must be explicitly addressed in terms of the means of assessment, the criteria for satisfaction of each graduate attribute and the required level at the exit level.
- (c) How are the results of these evaluations utilized towards the continuous improvement of the program.
- (d) **[TABLE-3]** . For each of the Graduate Attributes, provide the following information/evidence using Table 3 of document EAB-A13-P, indicating under each attribute:
  - (i) the module(s), including industrial training/work-based learning where applicable, in which assessment of the outcome or attribute takes place at exit level;
  - (ii) the assessment criteria and the method of assessment;
  - (iii) the level of performance required of the student; and
  - (iv) the consequences for the student of not satisfying the attribute.

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**C2 Mapping of Modules against Graduate Attributes**

**[TABLE-4]** Compile a matrix linking courses/modules, including industrial training/work-based learning where applicable, to graduate attributes (as per Table-4 of EAB-A13-P) to identify and track the contribution of each module to the graduate attributes, must be provided.

Each and every Graduate Attribute must be addressed. Is there any Graduate Attribute that has not been addressed or not yet been addressed at the time of submission of this Report? Please identify which one(s) and what is it proposed or planned to do it?

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**C3. Policies and Procedures to Validate Assessment of Grad Attributes**

**Sn6.4(5)**

Provide a description of the internal policies and procedures to validate the assessment of graduate attributes through internal processes and external moderation must be presented.

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**C4. Analysis of Strengths and Weaknesses of Assessment System  
Sn 6.4(6)**

Provide a concise analysis of the strengths and weaknesses of the system of assessing graduate attributes .

**D. Teaching, Learning and Quality Assurance Processes (CRITERION-3)  
[ Sn6.5]**

Provide evidence of the effectiveness of the teaching and learning process within the programme, addressing at least the following aspects:

**D1 Student's Academic Development**

(1) Taking the student entry level into account, how does the programme develop fundamental and core disciplinary knowledge as well as the specialist knowledge in the student and ensures the student satisfies the programme outcomes, i.e, the graduate attributes.

**[TABLE-4]** The format specified in Table 4 of document EAB-A13-P is recommended together with a suitable commentary.

**D2 Teaching and Learning Methodology**

(2) What is the teaching and learning methodology, how is it geared towards the student entry routes and level(s) and which learning opportunities does it provide?

**< University >**  
**[<PROGRAMME NAME>]**

Please provide the three most recent reviews (including annual and periodic), covering teaching and learning aspects and the Department's response.]

**D3 Academic Development Programmes**

(3) Which are the provided academic development programmes? Present a description of each. (If the academic development of students in the programme is covered fully in the HoF's submission, simply cross reference it here and highlight any programme-specific conditions).

**D4 Development of Independent Learning**

(4) How does the programme develop independent learning?

**D5 Programme Coordination**

(5) How is the programme coordinated?



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**D6 Formative Assessment**

(6) What is the role of formative assessment in the programme? How does the assessment process provide timely feedback to students?

Spell out the formative assessment methods that are applied in this programme.

What is the weighting given to formative assessment in the programme and how does it contribute to achieving the programme outcomes.

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**D7 Monitoring of Students' Progress**

(7) How and at which stages is the progress of students monitored?.

The educational institution should monitor the academic performance of its students carefully. The institution shall provide the required information for three complete academic years , showing:

- (i) the sanctioned intake and actual admission in the programme,
- (ii) success rate with and without backlogs in the stipulated period,
- (iii) academic performance of second and third year,
- (iv) placement and higher studies and
- (v) professional activities as per the format given in the SAR.

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**D8 Moderation of Assessment**

(8) What are the details of the method of moderation of assessment according to university practice? Include the role of internal and external moderators and external examiners.

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**D9 Role of Moderators and External Examiners**

(9) Who are internal and external moderators, external examiners etc. and what are their affiliations and qualifications? Which duties are assigned to each?

**[TABLE-5]** Provide a list. Table 5 of EAB-A13-P provides a format for this information.

Please provide the external examiner reports for each degree title.

Please provide minutes from the three most recent meetings.

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**D10 Quality Assurance**

**< University >**  
**[<PROGRAMME NAME>]**

**(10) (a) What are the processes used by the faculty/department for assessing and continuously improving the quality of the teaching, learning and assessment of the programme?**

**Provide specimen paper trails for quality assurance and the improvement aspects of the programme, showing:.**

**(i) Closing the loop at course level, program level and institution level ensures quality assurance of the programme.**

**(ii) All Module Outcomes attainment and Programme Outcomes attainment analysis is made to provide continuous improvement through course delivery, assessment and curriculum.**

**There still must be an assessment and evaluation process that periodically documents and demonstrates the degree to which outcomes are attained, [ABET]**

**(c) [Please provide details of the Departmental QA management structure and procedures including: a copy of the summary and recommendations from the most recent QAA Audit Review Report. If no Audit was carried out in a recent past, please state when this is scheduled for or expected.]**

**D11 Checks and balances in Assessment System**

**(11) What are the internal academic and administrative checks and balances in the assessment and promotion system? Provide a brief description.**

**D12 Arrangements for Programme Review and Development**

**< University >**  
**[<PROGRAMME NAME>]**

(12) What are the academic and administrative procedures for programme review and development, including service courses? Provide a brief description. How frequently is review done

**D13 Throughput and Cohort Analysis**

(13) **[TABLE-6]** What is the throughput of the programme and how does it vary by gender? What measures are taken to monitor and improve/maintain throughput? Data must be presented as a cohort analysis according to Table 6 of document EAB-A13-P.

**D14: Strengths and Weaknesses in Teaching Learning and Assessment Provcess**

(14) What are the strengths and weaknesses of the **teaching, learning and assessment process and the quality assurance and improvement process?** Provide a concise analysis.

<b>E. Resourcing and Sustainability (CRITERION-4) [Sn6.6]</b>
<b>E1.0 Students [Sn6.6.1]</b>
<p>(a) <b>[TABLE-7]</b> What are the entry routes to the programme (including academic development programmes, if applicable) and what are the entry requirements for each route? Any admission rating formulas must be explained.</p> <p>(b) What is the distribution of students entering by the various routes?</p> <p>(c) What is the distribution of students by admission rating for recent school-leavers? Use Table 7 in document EAB-A13-P.</p>
<b>E2 Policy on exemptions on account of Credit Earned elsewhere</b>
<p>(b) What are the policies on exemptions of modules taken for credits earned elsewhere?</p>
<b>E3 Faculty Teaching Capacity</b>
<p>(c) <b>[Table-6]</b> Describe the capacity of the faculty/department to conduct the programme for the enrolled number of students as reflected in Table 6 of EAB-A13-P, taking into account other commitments that the unit may have.</p>

**E4 Arrangements for academic counselling of Students**

Describe the processes and resources in place for the academic counselling of students.

Provide brief details of the academic and welfare support available to students as well as the Department's response to any recent Student Survey by the authorities.

Please also provide information on the Faculty or Department's request for and collection of student feedback and from the Staff Student Liaison Committee (if applicable).

- a. Are the Students affiliated to any Professional Engineering Institution or Society?
- b. How are the Professional Engineering Institutions promoted to the students? Any presentation by the Institutions?
- c. Are the students aware of the need for and requirements for registration after their graduation? How are the students informed of these requirements for registration?

[ABET] Academic student support systems play an important role in the teaching-learning process. Institutions are expected to provide information on the various such systems namely, mentoring/proctor system at individual level, feedback analysis and reward and corrective measures, self-learning facilities/materials and scope for learning beyond syllabus, career guidance, training and placement, details of activities of entrepreneurship cell, and provision for co-curricular and extra-curricular activities as per the format given in SAR].

•

**E5. Staff**

(a)[TABLE-9] Provide key staff indicators as defined in Table 9 of document EAB-A13-P.

Note: Staff must have competencies to cover all curricular areas of programme.

(b) Is the staff complement adequate to enable them to engage in activities outside their teaching duties, especially for the purposes of professional development, curriculum development, student mentoring/counselling, administrative work, training, and placement of students, interaction with industrial and professional practitioners.]

**E6 Faculty or Department's Policy/Strategies for Staff Replacement, Recruitment, Development and Retention**

**< University >**  
**[<PROGRAMME NAME>]**

Provide a description of strategies for staff recruitment, development and retention.

Provide brief details of the development policies for all staff. Detail how these are implemented and provide information on the staff appraisal scheme. Specify the training available and how this is funded. Include induction training for new staff. Please also state how professional registration with a Professional Engineering Institution is encouraged.

**E7 Research Profile of Academic Staff and Opportunities for Staff Development**

Describe the research profile of the staff and opportunities for the research development of staff. Does the academic load on the teaching staff provide the required opportunities for such R&D activities.

**E8 Support Staff**

(c) List the support staff, showing their overall responsibilities and contributions to the programme.

There should be an adequate number of qualified technical supporting staff to provide appropriate guidance to the students for using the equipment, tools, computers, and laboratories.

The institution must provide scope for the technical staff for upgrading their skills and professional advancement.

**E9 Teaching Load on Academic Staff**

**[TABLE-11]** Provide a summary of teaching load of academic staff for the current academic year and the staff: student ratio by year for all academic years for the current and past three years, as per Table 11 of EAB-A13-P.  
Please state how the ratio was calculated [ IMECHE]

**E10 Policy on Invited Speakers**

Provide a listing of invited speakers from industry/public bodies and their level of involvement for the current academic.

**E11 Opportunities for Staff to engage in Consultancy Activities**

Describe participation of academic staff in consultancy activities.

**E12 Engagement of Teaching Staff in Professional Institutions' activities**

Describe participation of academic staff in professional training and qualifications, and programme's projection/plan on professional training schemes for academic staff. **[Provide details of staff involvement in the activities of Professional Institutions and how such engagement adds to their professional development.**



**E13 State the extent of authority held by Head of Department for reviewing programmes or introducing new ones.**

Authority for creation, delivery, evaluation, modification and continuous improvement of the program.

**E14 Financial Resources**

- (a) **[TABLE-12]** List the budget allocations to the programme's host department over a five-year period under the following headings:

Equipment,  
Computing,  
Operational

Library (books and journals). Headings may vary depending on provider budget categories.

Funds must be sufficient to acquire, maintain, and operate facilities & equipment appropriate for the programme.

Use Table 12 of document EAB-A13-P.

- (b) Show that the institution provides adequate infrastructural facilities to
- (i) support the achievement of the Program Outcomes. Classrooms, tutorial rooms, meeting rooms, seminar halls, conference hall, faculty rooms, student study areas, and laboratories must be adequately furnished to provide an environment conducive to learning.
  - (ii) Foster faculty-student interaction;
  - (iii) encourages professional development & professional activities; and
  - (iv) provide opportunities to use modern engineering tools.

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**E15 Laboratories and Workshops**

List the laboratories and Workshops that support the programme with a short description of the facilities and function of each and the support provided for the programme.

The laboratories must be equipped with computing resources, equipment, and tools relevant to the programme.

The institution shall provide the required information about adequacy and equipment in the laboratories, their maintenance, overall ambience and safety measures in laboratories in the department to meet the curriculum requirements as well as the POs and PSOs, and technical manpower in the department, as per the format given in this Self Study Report.

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**E16 Computing and Other facilities**

List the available computing and networking, and other facilities to

- (i) students in the programme; and
- (ii) staff of the department, indicating the capacity and the time of availability for students in the programme.

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**E17 Safety Policy and Practice**

Provide information on Safety Policy and Practices within the Faculty/Department, including within the Laboratories and Workshops. How do they contribute to attainment of the educational objectives of the programme.

**E18. Special / Innovations**

Please provide details of any significant data on the Faculty and Department as well as on any innovative features, teaching practice, programme design, or areas of good practice that you wish to draw to the attention of the accreditation panel (keep to within 1000 words).

**E19 Sustainability**

Describe the Faculty/Department policy to ensure sustainability of this and other Programmes within the Department and show how this is practiced in its endeavours to ensure high standards of its programmes, policy on staff, opportunities for research and their funding, collaboration with other institutions, self financing, quality and variety of its programmes, publications by its academic staff, delivery of programmes meeting the needs of its stakeholders, the hosting of national and international conferences and seminars on subjects and issues challenging the society and the world at large, etc. [Keep within one A4 page]

### **F Impact of the programme**

Describe measures to assess the impact of the programme and how the results are used to improve the programme.

Describe any impact the the COVID-19 Pandemic has had on the programme.

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facilities of no longer than 30 minutes with commentary, or alternatively a presentation with comments

### **G. Tour of Laboratories and Facilities**

- A Tour of the various Laboratories and other Facilities that are used to supplement Classroom lectures as part of the Teaching and learning process to achieve the Graduate Attributes is a mandatory requirement in the process of accreditation of a programme.
- For an effective pre-Visit planning of the Accreditation Visit by the EAB Team, EAB requests that a pre-recorded video tour of Laboratories and typical classrooms used by students and serving the programme under evaluation be produced and uploaded with the Self Study Report. Such a Video, of a duration not longer than 30 minutes, with commentary in English be made. The comments must preferably show and state the name of the laboratory or other facility shown on screen, the name of each of the equipment being shown and its purposes, i.e. data that is gathered and how it contributes to achievement of a particular Module Outcome and/or Graduate Attribute. It must indicate if assignment is on individual basis or to a group. Research facilities need not be included unless they are used by students.

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**< University >**  
**[<PROGRAMME NAME>]**

- Alternatively, Self Study Report may comprise a presentation communicating the same information. However in such a case, if photographs of equipment are shown, then these must be photos of equipment in situ, and not the pictures from the manufacturer's catalogues.

Please indicate the nature of the presentation: Video Clip or Presentation

### **EVALUATIONS**

1. **Initial Evaluation:** A paper-based evaluation of a proposed programme based on comprehensive planning information. *This mechanism is available to HEIs that do not have programmes accredited by EAB for at least one cycle.*
2. **Simplified Initial Evaluation:** A simplified paper-based evaluation of a proposed programme based on selected planning information. *Available to HEIs that have programmes accredited by EAB for at least one cycle, i.e. accredited once for a 5-year period.*
3. **Desktop Evaluation:** A comprehensive paper-based evaluation of an existing unaccredited programme that produces graduates. May be required as a precondition to an accreditation visit in the case of providers that do not have programmes accredited by EAB but have completed one accreditation cycle, i.e, have run for 4 years and have produced at least one cohort of graduates.

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### **INSTRUCTION LEVEL**

The instructional level of content relating to one or more graduate attribute in each learning activity (usually a course) must be classified in a progression from **introductory (I)** through **intermediate development (D)** to **advanced application (A)** level. The programme must recognise that over the four years of an engineering programme:

1. The depth and the complexity of the material increases
2. The way the material is covered changes
3. Expectations for success change
4. How a student uses the material changes.

**At Introductory Level (I),** Students acquire the working vocabulary and the underlying concepts of the area of content, which are presented in a somewhat simplified way.

**< University >**  
**[<PROGRAMME NAME>]**

**At the intermediate development level (D)**, the knowledge acquired is put to use to probe more deeply, access and read the literature, and deepen their exploration into the concepts. Their scope of learning widens and encompass subdisciplines.

**At the advanced application level (A)**, the students approach mastery in the area of content. They explore deeply into the discipline and learn and appreciate the intricacies and uncertainties that characterize the leading edges of any field. An advanced student can be expected to be able to relate course material across different courses, to begin to synthesize and integrate and achieve fresh insights. Students at this level are working with the knowledge very differently, perhaps even creating new knowledge through independent investigation.

**Go BACK ALT+ [←]**

**Range of Problem Identification and Solving**

<b>Range of Problem Identification and Solving</b>		
	<b>Attributes</b>	<b>Complex Engineering Problems have characteristic WP1 and some or all of WP2 to WP7:</b>
<b>WP1</b>	<b>Depth of Knowledge Required</b>	<b>Cannot be resolved without in-depth engineering knowledge at the level of one or more of WK3, WK4, WK5, WK6 or WK8 which allows a fundamentals-based, first principles analytical approach .</b>
<b>WP2</b>	<b>Range of conflicting requirements</b>	<b>Involve wide-ranging and/or conflicting technical, non-technical issues (such as ethical, sustainability, legal, political, economic, societal) and consideration of future requirements</b>
<b>WP3</b>	<b>Depth of analysis required</b>	<b>Have no obvious solution and require abstract thinking, creativity and originality in analysis to formulate suitable models</b>
<b>WP4</b>	<b>Familiarity of issues</b>	<b>Involve infrequently encountered issues or novel problems</b>
<b>WP5</b>	<b>Extent of applicable codes</b>	<b>Address problems not encompassed by standards and codes of practice for professional engineering</b>
<b>WP6</b>	<b>Extent of stakeholder involvement and conflicting requirements</b>	<b>Involve collaboration across engineering disciplines, other fields, and/or diverse groups of stakeholders with widely varying needs</b>
<b>WP7</b>	<b>Interdependence</b>	<b>Address high level problems with many components or sub-problems that may require a systems approach</b>
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**Complex Engineering Problems**

**< University >**  
**[<PROGRAMME NAME>]**

What distinguishes the professional engineer from the Technologists and the Engineering Technicians is their ability to work on and find solutions to complexity engineering problems. The Graduate Attributes therefore relate to analysis, investigation and solution of complex engineering problems.

A complex engineering problem is defined by the following characteristics:

1. It requires the application of in-depth knowledge of the nature described in the knowledge profiles associated with the graduate attributes.
2. It will involve one or more of the following additional characteristics:
  - involves wide-ranging or conflicting Issues
  - has no obvious solution such that originality is required
  - involves infrequently encountered issues
  - is outside accepted standards and codes
  - involves diverse stakeholders and needs
  - is posed at a high-level with many components or sub-problems

**Go BACK ALT+ [←]**

Range of Activities		
	Preamble	Complex activities means (engineering) activities or projects that have some or all of the following characteristics:
EA1	Range of Resources	Involve the use of diverse resources including people, data and information, natural, financial and physical resources and appropriate technologies including analytical and/or design software
EA2	Level of Interactions	Require optimal resolution of interactions between wide-ranging and/or conflicting technical, non- technical, and engineering issues
EA3	Innovation	Involve creative use of engineering principles, innovative solutions for a conscious purpose, and research-based knowledge
EA4	Consequences to Society and Environment	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation
EA5	Familiarity	Can extend beyond previous experiences by applying principles-based approaches
		<b>Go BACK ALT+ [←]</b>

### KNOWLEDGE AND ATTRIBUTE PROFILE

**A Knowledge and Attitude Profile (WK) is an indicated volume of learning and the attributes against which graduates must be able to perform.**

WK1	A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social science
WK2	Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline

**< University >**  
**[<PROGRAMME NAME>]**

WK3	A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline
WK4	Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.
WK5	Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area
WK6	Knowledge of engineering practice (technology) in the practice areas in the engineering discipline
WK7	Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development* [*Represented by the 17 UN Sustainable Development Goals (UN-SDG)]
WK8	Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues
WK9	Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

*A program that builds this type of knowledge and attitude and develops the base attributes listed below is typically achieved in 4 to 5 years of study, depending on the level of students at entry.*

**Go BACK ALT+ [←]**

**GRADUATE ATTRIBUTES**

GA1	Engineering Knowledge: <i>Breadth, depth and type of knowledge, both theoretical and practical</i>	Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialisation as specified in Section 13.6 (Knowledge and Attitude Profiles WK1 to WK4 respectively to develop solutions to complex engineering problems.
GA2	Problem Analysis: <i>Complexity of analysis</i>	Identify, formulate, research literature and, analyse complex engineering problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences, with holistic considerations for sustainable development*. <b>Knowledge and Attitude Profile for delivery of GA2: As for GA1, e.g., WK1 to WK4.</b>
GA3	Design and Development of solutions: <i>Breadth and Uniqueness of Engineering problems, that is, extent to which problems are original and to which solutions have not previously been identified or codified</i>	Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health, and safety, whole-life cost, net zero carbon as well as resource, cultural, societal and environmental considerations as required. <b>Knowledge and Attitude Profile for delivery of GA3: WK5</b>
GA4	Investigations: <i>Breadth and Depth of investigations and experimentation</i>	Conduct investigations of complex engineering problems using research methods including research-based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions; <b>Knowledge and Attitude Profile for delivery of GA4: WK8</b>
GA5	Tool Usage: <i>Level of understanding of the appropriateness of technologies and tools.</i>	Create, select, and apply, and recognise limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems. <b>Knowledge and Attitude Profile for delivery of GA5: WK2 and WK6</b>
GA6	The Engineer and the World: <i>Level of knowledge and</i>	When solving complex engineering problems, analyze and evaluate sustainable development impacts* to: society, the economy,



**< University >**  
**[<PROGRAMME NAME>]**

	<i>responsibility for sustainable development.</i>	sustainability, health and safety, legal frameworks, and the environment [ <i>*Represented by the 17 UN Sustainable Development Goals (UN-SDG)</i> ]. <b>Knowledge and Attitude Profile for delivery of GA6: WK1, WK5, and WK7</b>
GA7	<i>Ethics: Understanding and level of practice</i>	Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion. <b>Knowledge and Attitude Profile for delivery of GA8: WK9</b>
GA8	<i>Individual and Collaborative Teamwork: Role in and Diversity of Team</i>	Function effectively as an individual, and as a member or leader in diverse teams and multi-disciplinary, face-to-face, remote and distributed settings. <b>Knowledge and Attitude Profile for delivery of GA8: WK9</b>
GA9	<i>Communication: Level of communication according to type of activities performed</i>	Communicate effectively and inclusively 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, taking into account cultural, language, and learning differences.
GA10	<i>Project Management and Finance: Level of Management and Finance required for differing types of activity</i>	Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and multidisciplinary environments.
GA11	<i>Lifelong learning: Duration and manner</i>	Recognise the need for, and have the preparation and ability for (c) independent and life-long learning, (d) adaptability to new and emerging technologies and (e) critical thinking in the broadest context of technological change. <b>Knowledge and Attitude Profile for delivery of GA11: WK8.</b>
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## H. EXHIBITS: (Visit Documents)

The following items must be available *in the Conference Room put at the disposal of the Evaluation Team evaluating the programme concerned by this Self Study Report.*

**EXHIBITS to be available in the Exhibit Room provided for this purpose to the Accreditation Team.**

**For Each Programme to be Evaluated/Accredited the following should be available for examination by the members of the Visit Team:**

**< University >**  
**[<PROGRAMME NAME>]**

	<p>1. Programme Prospectus /Student Handbook</p> <p>2. Module Boxes for each of the Module taught containing:</p> <p style="padding-left: 20px;">Examination Papers for the last three years, including most recent. [with student names removed as necessary from the most recent complete academic year only]</p> <p style="padding-left: 20px;">Model solutions</p> <p style="padding-left: 20px;">A copy of the examination marks for the whole cohort examination scripts and coursework</p> <p style="padding-left: 20px;">Re-sit papers from the last three years</p> <p style="padding-left: 20px;">A minimum of 15 samples of assessed student work across from across the whole band of marks, or the actual number if lesser than 15. Please select at least 3 good, 3 average and 3 weak/Failed) [Note for EAB: Consultant John Cato of ECSA ha suggested a downward review of the number of scripts to be scrutinised] .</p>
	<p>Note through the Course Work the Evaluation Team would examine the evidence supplied regarding:</p> <ul style="list-style-type: none"> <li>○ <input checked="" type="checkbox"/> Type and level of work required in courses.</li> <li>○ <input checked="" type="checkbox"/> Grading standards and consistency.</li> <li>○ <input checked="" type="checkbox"/> Achievement of Programme Outcomes.</li> <li>○ <input checked="" type="checkbox"/> Validation of data submitted in the Self Study Report.</li> </ul> <p>3. Examples of final year capstone project and the research oriented investigational projects, where applicable, for the most recent year that are representative of the range of sub-disciplines in the programme of good, average and just passed/failed students. (The number of reports to be presented is the smaller of the number in the class or the number 10), selected across the whole band of marks i.e. top, middle and bottom (or for the whole cohort if less than nine) with student names removed as necessary.</p> <p style="padding-left: 20px;">A copy of the project marking sheet for the whole cohort/feedback sheets, along with marking rubric for each of the projects provided.</p> <p>4. Course/module material supplied to current students or expected to be obtained by students: tutorial sheets, instruction sheets for laboratory experiments, prescribed texts, notes, etc. Where it is worth 5 credits or more, or it is the only element instrumental in meeting AHEP learning outcomes in a module:</p> <p>5. Information on the times that students may access the laboratory, computing facilities and other resources;</p> <p>6. access to individual student academic records on request;</p> <p>7. Evidence that the results of assessment of course outcomes and program outcomes are being applied to the review and ongoing improvement of program effectiveness; Include:</p> <p style="padding-left: 20px;">Sample student Feedback Form;</p> <p style="padding-left: 20px;">Sample for industry-institution interaction;</p> <p style="padding-left: 20px;">Results of quality assurance review</p> <p>8. CVs of the department's full-time academic staff (These may be full CVs or two-page summaries);</p> <p>9. CVs of part-time lecturers serving courses/modules in which graduate attributes are assessed. These may be full CVs or two-page summaries; CVs of other part-time lecturers are not required; their details are summarised in Table 8 (EAB-A13-P);</p>





< University >  
[<PROGRAMME NAME>]