INSTITUTION OF ENGINEERS,

SRI LANKA.

ENGINEERING TECHNOLOGY PROGRAMME

ACCREDITATION MANUAL

September 2013

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1.0 INTRODUCTION

The Institution of Engineers, Sri Lanka (IESL) oversees the Engineering Profession in Sri Lanka, and in accordance with its Charter and provisions of the Act No. 17 of 1968 is empowered to admit to membership, classify and confer titles indicating the professional standing of its members. In fulfilment of its Charter obligations IESL has been responsible for the accreditation of engineering education programmes in Sri Lanka and in providing consultative feedback on the development of engineering education programmes comparable to global practice.

The Institution of Engineers, Sri Lanka evaluates engineering education programmes and accords accreditation in accordance with established criteria and procedures, through its Accreditation Board.

This Manual outlines the criteria and procedures for accrediting an engineering technology programme by the Institution.

2.0 DEFINITIONS

2.1 GENERAL

IESL / Institution	-	The Institution of Engineers, Sri Lanka
IESLAB / Board	-	The Institution of Engineers, Sri Lanka Accreditation Board
Panel	-	A team of evaluators appointed to undertake accreditation activities

2.2 UNIVERSITY PROGRAMME

University	-	An institution of higher learning, authorised by legislation (either directly or indirectly) to award engineering degrees.
Faculty	-	The entity responsible for administration and conduct of different engineering education programmes at the University.
Department	-	The entity responsible for the design and conduct of the programme to be accredited.
Programme	-	The sequence of structured educational experience undertaken by the students leading, on completion and on satisfactory assessment of performance, to the award of an engineering qualification for which accreditation is sought.
Degree	-	A graduate level engineering qualification in Sri Lanka normally titled "Bachelor of the Science of Engineering" or "Bachelor of Technology".
Engineering Technologist	-	Those who are competent to apply technological principles and physical processes to solve broadly defined engineering problems.
Academic staff	-	The staff responsible for teaching in the programme leading to the award of the degree.
Visiting staff	-	Staff from other universities and / or practising engineers giving instructions on a part-time basis.
Assessment	-	Judgement of a student's work by the University or Faculty.
Evaluation	-	Judgement of the engineering programme by the Institution or its appointed agency.
Stakeholders	-	All groups with key interest in engineering education and its outcome.
External Examiner	-	A suitable person with high academic standing outside the university, who scrutinises and reports on examination and assessment
OBE	-	Outcomes based education
ICC	-	Industry Consultative Committee: a body consisting of professionals from industries, government, professional organisation, regulatory, alumni etc., appointed by the university to ensure the programme's relevancy to the stakeholders' needs.

2.3 ACCREDITATION

Accredited Degree -	A degree eligible for graduate registration with the Institution as an "Associate".
Recognized Degree -	A degree eligible for graduate registration with the Institution as an "Associate" after satisfying conditions stipulated by the Institution
Full Accreditation -	A programme that fully satisfies the minimum standard for accreditation set by the Institution. Full accreditation is normally given for a period of five (5) years from the date of accreditation.
Conditional Accreditation -	Where there are minor shortcomings in meeting accreditation requirements, the programme may be given conditional accreditation for a period of not more than two (2) years during which the Faculty must take necessary corrective measures to ensure continuation of accreditation.
Provisional Accreditation -	Provisional accreditation may be awarded to a new programme, provided that its quality meets the Institution's requirements. Provisional accreditation does not guarantee full accreditation if the Faculty fails to maintain the standards of the programme.

3.0 INSTITUTION OF ENGINEERS, SRI LANKA ACCREDITATION BOARD ANDEVALUATION PANEL

3.1 INSTITUTION OF ENGINEERS, SRI LANKA ACCREDITATION BOARD

The policy on accreditation of engineering education programmes is laid down by the Institution and may only be varied by the Institution. Implementation of this policy is the responsibility of the Institution of Engineers, Sri Lanka Accreditation Board, hereafter called the IESLAB.

The Institution shall appoint the members of IESLAB consisting of:

- A Chairman
- A representative of the University Grants Commission
- A representative of the Ministry of Science & Technology
- Deans of the Engineering Faculties of Sri Lankan universities
- The Chairman of the IESL Registration Board
- Seven (7) members representing the major disciplines of engineering
- The Executive Secretary of the Institution

The members of the IESLAB comprise of persons from academic institutions and industry. In appointing the members of the Board, the Institution shall confine the membership to Chartered Engineers as far as possible and maintain a reasonable spread of various expertise across different branches of engineering.

All members shall be Chartered Engineers, except when such persons are not available within the represented organisation.

The terms of reference of the Board shall be to:

- assist the Institution in formulating and updating accreditation policies and criteria.
- make, and amend guidelines and operating procedures for accreditation.
- oversee all operational arrangements, and to appoint the evaluation panel.
- evaluate Sri Lankan undergraduate engineering degree programmes for accreditation purposes in accordance with established criteria and procedures.
- respond to any complaints or appeals concerning the accreditation process, and to any proposals for change.
- evaluate and recommend actions for implementing and maintaining international accreditation agreements.
- report periodically to the Institution on its work, and when appropriate, recommend changes to the Institution's policy on accreditation.
- foster dissemination of developments and best practices in engineering education.
- advise the Institution on public statements or representations that should be made in relation to engineering education.
- advise and assist Sri Lankan universities in reviewing and making improvements to engineering degree programmes.
- collaborate with other standing committees of the Institution on issues of mutual interest.

3.2 EVALUATION PANEL

An evaluation panel is appointed by the IESLAB for making the accreditation visit, and it must consist of:

- a Chairperson, who is a member of the IESLAB or a senior academic,
- two other members, typically chosen for their broad experience in engineering and their ability to evaluate the generic programme outcomes and quality systems, and
- An international panel member

The panel shall include at least two members with extensive academic experience and one member with extensive experience in employing practising graduate engineers. All of the panel members must be Chartered Engineers.

4.0 POLICY ON ACCREDITATION

4.1 THE PURPOSE OF ACCREDITATION

University education provides the learning base on which each engineer's professional career is built. The engineering profession requires its members to have competence in engineering, as well as an understanding of the effects of engineering on the society and the environment. The purpose of accreditation is to ensure that the engineering education programme concerned imparts the minimum academic requirements needed for an individual to register with the Institution as a graduate engineer. The processes of accreditation place emphasis on the quality of the students, academic staff, support staff and teaching facilities. It is about continual improvement of engineering programs.

Accreditation thus provides public knowledge of engineering education programmes that guarantee successful students of entry into the profession, and gives an assurance to prospective students on the entry into the profession. It gives a feedback to the Government and the University of the basic requirements of a graduate engineering education programme, and the level of resources reasonably needed to meet these requirements.

Accreditation also provides a basis for international comparability, recognition and graduate mobility.

4.2 THE GENERIC ATTRIBUTES OF AN ENGINEERING TECHNOLOGIST

Through the process of accreditation, the Institution will ensure that graduates from an accredited programme of study have acquired the following generic attributes, and are thus adequately prepared to enter the profession and continue to practise.

- **Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies.
- **Problem Analysis:** Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- **Design/ development of solutions:** Design solutions for broadly-defined engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- **Investigation:** Conduct investigations of broadly-defined problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
- **Modern Tool Usage:** Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering activities, with an understanding of the limitations.
- **The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
- **Environment and Sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
- **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- **Individual and Team work:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
- **Communication:** Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
- **Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the context of technological change.

The full list of the International Engineering Alliance Graduate Outcomes Exemplar Statements is in Appendix F.

4.3 THE LEARNING ENVIRONMENT AND EXPOSURE TO PROFESSIONAL PRACTICE

4.3.1 The Learning Environment

In the accreditation process emphasis is given to the qualitative evaluation of not only the programme of education, but also the overall environment in which the programme is conducted. In the latter, the quality of the learning experience is reflected by the quality, morale and commitment of the academic staff, support staff and the students, and the quality of teaching facilities such as laboratories, the library and the computing facilities available to students. The number of academic staff devoted to the programme, including part-time visiting staff, must be large enough to effectively cover all of the curricular areas of the programme. There must be a sufficient number of full-time academic staff to ensure adequate levels of student-staff interaction, student counselling and the development and administration of the curriculum

4.3.2 Exposure to Professional Engineering Practice

It is expected that the students are continually exposed to professional engineering practice throughout the programme of engineering education to enable them to develop an engineering approach and to learn to appreciate professional engineering ethics. In order to obtain this exposure the programme of engineering education must specifically include a combination of the following:

- Use of staff with industry experience
- Practical experience in an engineering environment outside the teaching establishment
- Mandatory exposure to lectures on professional ethics and conduct
- Use of guest lecturers from industry
- Use of industry visits and inspections
- An industry-based project, particularly in the final year.

5.0 CRITERIA FOR ACCREDITATION

The accreditation of an engineering education programme by the IESL follows an evaluation by the IESLAB, which involves the following:

(a.) the structure of the academic programme, the curriculum components and syllabi, laboratory, design, field and project work, and industrial training
(b.) the academic staff and students
(c.) teaching facilities, such as class rooms, study areas, the library, computing and IT facilities, and the general infrastructure
(d.) quality management systems.

5.1 THE ACADEMIC PROGRAMME

An accredited engineering degree programme should be capable of creating the platform from which individual aspirations could develop, and therefore should provide a coherent and integrated broad based knowledge with emphasis on principles of science and engineering with a certain degree of speciality in the chosen discipline, as set out in Appendix B.

The criteria for curriculum content specified in the following sections ensure that the graduate receives a foundation in mathematics and basic sciences, a broad preparation in engineering sciences engineering design and projects an exposure to other non-technical subjects that complement the technical subjects. These components are judged both qualitatively and quantitatively. The IESLAB will accommodate deviations from the above-mentioned criteria if it is satisfied that such deviations serve to promote innovation in engineering education and disseminate good practice.

5.1.1 Definitions of Active Hours (AHs) and Academic Credits (ACs)

For an academic activity that is granted academic credit, and in which the number of hours associated with it corresponds to the actual contact time of that activity, such as lectures, tutorials, laboratory, design or fieldwork, an Active Hour (AH) is defined as follows:

- one (1) hour of lecture
- two (2) hours of tutorial, laboratory, design or field work

One AH continued over the duration of a semester is defined as an Academic Credit (AC). (one (1) AC is equivalent to about fourteen (14) Ahs).

For activities in which contact hours cannot be used to properly describe the extent of the work involved, such as project study, work camps and industrial training, the following definitions are used for an Academic Credit (AC):

- one (1) week of project study
- two (2) weeks of work camp
- four (4) weeks of industrial training.

5.1.2 Requirements of the Academic Programme

The title of the academic degree programme to be accredited must include the word "engineering" and it must be truly descriptive of the curriculum content. For accreditation, a Bachelor of Engineering Technology degree programme in Sri Lanka must be of a duration of not less than three (3) academic years of full-time equivalent study based on entry through a satisfactory level of achievement in relevant subjects at the General Certificate of Education (Advanced Level) examination conducted by the Department of Examinations of Sri Lanka or through an equivalent qualification. When a programme has several options, all options are examined, and each one must meet the established criteria. The IESLAB must be satisfied that the programme title is appropriate for all students graduating in the programme irrespective of the option taken. Although it is not the intention of the IESLAB or IESL to prescribe compulsory programme structures, curriculum details or teaching methods broad guidelines which will satisfy expected outcomes are given here.

The entire programme must include a minimum of 108 Academic Credits (ACs). It is expected that accredited programmes will continue to have additional academic credits to demonstrate innovation and to achieve the special goals the particular engineering faculty or school may have for engineering education.

Appropriate laboratory experience must be an integral component of the curriculum, with instructions in safety procedures. The curriculum must prepare students to learn independently, and must expose them appropriately to engineering research and development activities. It must be ensured that the students are made aware of the role and responsibilities of the professional engineer in society by exposing them to ethics, equity, public and worker safety, and concepts of sustainable development.

5.1.3 Structure and Content of the Academic Programme

The initial education of an engineering technologist should provide an in-depth core of scientific and technical skills together with a sufficient breadth of experience in complementary studies, consisting of humanities, social sciences, arts, management, engineering economics and communication, in order to ensure continuing awareness of these disciplines. It is appropriate for the programme structure to be designed in such a way that gives a progressive shift of emphasis from engineering science and principles in the early stages to more integrated studies in the final year.

The essential elements are grouped under several headings.

(a) Mathematics, Basic Sciences and Computing (Minimum of 18 ACs)

A minimum of eighteen (18) academic credits is recommended for the components of mathematics, basic sciences and computing.

Mathematics should include appropriate elements of linear algebra, differential and integral calculus, differential equations, probability, statistics, numerical analysis and discrete mathematics. Some of the mathematical techniques may be taught within other subjects in the programme where they are relevant.

The basic sciences component of the curriculum must include elements of physics and chemistry, and other relevant elements of life sciences and earth sciences. These subjects are intended to impart an understanding of natural phenomena and relationships through the use of analytical and / or experimental techniques.

(b) Engineering Sciences and Engineering Design(Minimum of 72 ACs)

A minimum of seventy two (72) academic credits from a combination of engineering sciences engineering design and projects and exposure to professional practice is recommended. Of this, a minimum of 24ACs must be engineering design and projects; and a minimum of 24ACs must be an engineering discipline specialisation.

Engineering science subjects would normally have their roots in basic sciences and mathematics, but carry knowledge further towards creative applications. They may involve the development of mathematical or numerical techniques, modelling, simulation and experimental procedures. Application to the identification and solution of practical engineering problems is stressed. In addition to engineering science subjects pertinent to the discipline, the curriculum must include engineering science content, which imparts an appreciation of important elements of other engineering disciplines.

Engineering design integrates mathematics, basic sciences, engineering sciences and complementary studies in developing elements, systems and processes to meet specific needs. It is a creative and iterative process subject to constraints, which may be governed by standards or legislation.

The engineering curriculum must end with a significant design experience, which is based on the knowledge and skills acquired in earlier coursework. Such a project could give the student an exposure to the concepts of teamwork and project management. Whilst group projects, such as in design exercises, may be appropriate for work in earlier years, the final year project is required to demand individual analysis and judgement. Even though work may be carried out in small groups, the student should be assessed independently from the work of others. The student is expected to develop techniques of literature review and information gathering.

The engineering sciences and engineering design components of the curriculum must include appropriate content, which requires the application of computers.

(c) Complementary Studies(Minimum of 18 ACs)

A minimum of twelve (15) academic credits for studies in management, engineering economics and communication and three (3) academic credits in humanities, social sciences, arts and professional ethics are recommended to complement the technical content of the curriculum.

While considerable flexibility is offered in the choice of suitable courses for the complementary studies component of the curriculum, some areas of study are considered to be essential in the education of an engineer. Accordingly, the curriculum must include studies on the impact of technology on society, engineering economics, and subject matter that deals with central issues, methodologies and thought processes of the humanities and social sciences.

Student's capability to effectively communicate, both orally and in writing, must also be developed. From the initial stages of the programme, careful attention must be paid to the development of clear and concise reporting skills of the students.

5.1.4 Exposure to professional Engineering practice

Industrial training in a practical engineering environment, directly assisting professional engineers, would give the student a valuable insight into professional practice. Such experience would complement the formal studies at the educational establishment, and should ideally consist of several different types of experience. This must include practical experience in the basic manufacturing and construction techniques applicable to the student's chosen discipline of engineering. The opportunity to observe human and industrial relations, job organisation, maintenance, safety and environmental procedures from the point of view of the general workforce is an important component in the early preparation for a career as an engineering technologist.

IESL strongly advocates that each undergraduate undergoes industrial training for a period of not less than twelve (12) weeks, and submits a report on the training certified by the employer's representative to enable assessment and the award of credits. The academic credits obtained for industrial training (subject to a maximum of six ACs) is considered under the category of engineering sciences engineering design and projects.

5.2 ACADEMIC STAFF AND STUDENTS

5.2.1 Academic Staff

The character of the educational experience of the student is greatly influenced by the competence and outlook of the academic staff. The number of staff devoted to the programme must be large enough to cover, by experience and interest, all curricular areas of the programme. The faculty may engage part-time or visiting staff members, who are outstanding professionals in their fields, to cover certain subject areas in the curriculum outside the specialisations of the full-time staff.

The academic staff teaching courses in the engineering curriculum are expected to have a high level of competence, and to be dedicated to the aims of engineering education. In general, the academic staff should have a postgraduate degree, preferably at doctoral level. However, staff with a good first degree, and having wide industrial experience along with other acceptable professional qualifications, may be considered to give an industrial flavour to the programme. This category of staff without adequate research experience should be encouraged to obtain such experience after recruitment. Academic staff without industrial experience and professional qualifications should also be encouraged to obtain them after recruitment.

The overall competence of the faculty will be judged by such factors as the level of academic education of its members, the diversity of their backgrounds, their ability to communicate effectively, their experience in teaching and research, their level of scholarship as shown by scientific and professional publications, their degree of participation in professional, scientific and learned societies and their personal interest in the students' curricular activities.

The teaching loads of academic staff should allow adequate time for participation in research and professional development activities. The university must ensure a balanced and conducive environment for effective teaching, research and professional development. The academic staff of the engineering faculty must provide proper curricular and career counselling to the students.

To ensure effective teaching, the equivalent full-time academic staff to student ratio should be maintained at 1:12, or better. There must also be a sufficient number of trained and qualified members of the technical and administrative staff to assist in the conduct of the educational programme. The staff to student ratio is to be calculated as set out in Appendix A.3.9.4.

5.2.2 Students

Students pursuing engineering education programmes must have a sound understanding of mathematics and physical sciences. The standard entry qualification for such programmes in Sri Lanka is the General Certificate of Education (Advanced Level) examination, or equivalent, with good passes in mathematics, physics and chemistry. The students also need to acquire English language skills to follow the course in English medium and possess competency in the use of computers and IT skills. The university must ensure that any student who does not meet these criteria would undertake additional suitable remedial programmes in order to attain the equivalent entry qualification.

The quality of the educational experience is also reflected by the morale and commitment of the students.

5.3 TEACHING FACILITIES

The quality of the environment in which the programme is delivered is important as it influences the quality of educational experience gained by students. Therefore, there must be an adequate number of suitable classrooms, audio-visual and projection facilities, study areas, information resources (library), computing and information technology systems, and general infrastructure to meet the programme's objectives. This must enable students to learn the use of modern engineering and organisational tools, and explore beyond the formal dictates of their specific programme of study.

For programmes offered at multiple or remote locations, and those offered partly in the distance mode, sufficient communication facilities must be provided to give those students a learning experience and support equivalent to that of the on-campus students. There must also be adequate facilities for student-staff interaction. On-campus students should be encouraged to participate in the other activities of the University, and reasonable effort should be made to provide similar opportunities for other students.

Laboratories and workshops should be adequately equipped for experiments and "hands-on" experience in the area of the core subjects. Appropriate experimental facilities must be available for students to gain substantial experience in understanding and operating engineering equipment, and in designing and conducting experiments. The equipment must be representative of modern engineering practice, including modern computerised equipment and software. Laboratory experiences must provide students with 'hands–on' experience and not just demonstrations. Where practical work is undertaken at another University, or in industry, arrangements must be made to provide reasonable accessibility and opportunities for learning.

5.4 QUALITY MANAGEMENT SYSTEM

5.4.1 Strategic Statement, Institutional Support and Leadership

The University must demonstrate that it regards a quality engineering education as a significant and long-term component of its activities. This would most commonly be reflected in the University's mission statement and in its strategic plans. It must have adequate polices and mechanisms for planning, development, delivery and review of engineering education programmes, and for academic and professional development of staff.

The University must have in place adequate policies and mechanisms for funding the programme; for attracting, appointing, retaining and rewarding well-qualified staff, and providing for their ongoing professional development; and for providing and updating infrastructure and support services. It must ensure that creative leadership is available to the University through the appointment of well-qualified and experienced senior staff in sufficient numbers.

5.4.2 Scheme of Assessment of the Programme of Study

The Rules and Regulations for assessment procedures of the programme of study must be made available and maintained by the Faculty.

The University should be able to demonstrate its management system for assessment of students, which should include:

(a.) examination regulations;

(b.) system of assessment and criteria for a Pass and Grades;

(c.) procedures for preparation of examination papers;

(d.) standard of examination papers;

(e.) assessment and moderation procedures for final year projects, and;

(f.) assessment of industrial training.

The University should have one or more external examiners for each programme of study to independently scrutinise and report on examinations and assessment in each academic year. All external examiners' reports shall be made available to the panel.

5.4.3 Assessment of Programme Objectives

The University must have systems in place to ensure that the stated outcomes are met and that the programme objectives and quality are continuously reviewed and improved. The system must include:

- Documented processes for programme planning, curriculum development and approval, and regular curriculum review. The introduction of new programmes or majors must relate to the educational objectives and needs of the country.
- An admissions system that ensures an acceptable standard of entry for students. It may include qualifying or remedial/bridging programmes where appropriate. There must be policies on the acceptance of transfer students, validation of programmes taken for credit elsewhere and recognition of prior learning, be it formal or informal.
- Processes for securing feedback and comments from students, graduates, employers of graduate engineers and representatives of the wider community, and evidence of their systematic application to their view and continuing improvement of programme objectives, curriculum and content, and the quality of teaching and learning, including evidence that the action taken as a result of this feedback is communicated back to the various stakeholder groups. Post-programme processes should include graduate employment data, alumni surveys documenting achievement, and employers' surveys of longer-term performance and development.
- Substantial participation by practising professional engineers, and leading employers of engineering graduates in the Faculty's forward planning, and its processes for ensuring educational quality including assessment of graduate performance. There must be evidence of real dialogue and involvement. Details of the regular activities and input from the Industry Consultative Committees (ICCs) must be provided.
- A process for comparing or benchmarking programme standards (particularly final year projects and comprehensive design projects) with those of other universities, nationally and preferably internationally. This could be undertaken with the use of external examiners or external advisors.
- A record management system that enables audit of the above processes at any time and confirmation of their integrity.

5.5 PROGRAMME OUTCOMES

Programme Outcomes are statements that describe what students are expected to know and be able to perform or attain by the time of graduation. These relate to the skills, knowledge, and behaviour that students acquire through the programme.

The skills, knowledge and behaviours that are expected from the graduates of a university bachelors degree programme meeting the educational requirements towards registration as a Professional Engineer of the Institution of Engineers Sri Lanka are listed under 10 headings i– x as given below.

(i) ability to apply knowledge of basic science and engineering fundamentals;
(ii) ability to communicate effectively, not only with engineers but also with the community at large;
(iii) in-depth technical competence in at least one engineering discipline (as set out in Appendix B);
(iv) ability to undertake problem identification, formulation and solution;
(v) ability to utilise a systems approach to design and operational performance;
(vi) ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
(vii) understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
(viii) understanding of the principles of sustainable design and development;
(ix) understanding of professional and ethical responsibilities and commitment to them; and
(x) expectation of the need to undertake lifelong learning, and capacity to do so.

Engineering degree programmes are required to specify the abilities and characteristics that students are expected to possess upon graduation. These outcomes must reflect the needs of the students, the staff, and the employers. The engineering degree programme has to develop and implement assessment processes to demonstrate that their graduates have acquired the stated outcomes. The University shall have published Programme Outcomes that have been formulated considering items (i) to (x) given above, any added outcomes by that can contribute to the achievement of its stated Programme Objectives, and the International Engineering Alliance Graduate Outcomes Exemplar Statements (as provided in Appendix F).

Explicit mapping of the programme outcomes must be undertaken to demonstrate the attainment of these attributes. The curriculum and assessment must be focused on an outcomes based approach (OBE) and not an input approach.

6.0 ACCREDITATION PROCEDURE

The accreditation procedure of the Engineering Accreditation Board normally comprises the steps indicated in the following sections.

6.1 APPLICATION FOR ACCREDITATION

An accreditation assessment is initiated only at the request of the University / Faculty that conducts the programme of study concerned.

- In the case of a programme of study that is to be accredited for the first time, the request must be made not less than six (6) months in advance.
- In the case of a programme of study that has previously been accredited such request must be made not less than six (6) months before the accreditation lapses.

Once the request is received, the Board Secretariat sends to the applicant institution documentation required for the visit. This documentation includes information on the University / Faculty / Department, the programme of study, the staff, students, teaching facilities and quality assurance systems (Appendix A). The completed documents along with any additional supporting documents must be returned to the Board, which will acknowledge receipt of the same. The documentation may be sent in both electronic or hard copy format, at least eight (8) weeks before the proposed date of the visit.

If the Board is satisfied that the information provided is adequate, it will communicate to the relevant institution details regarding the visit. Any additional information requested must be received within two (2) weeks. If the information is considered to be inadequate, further information is requested from the institution before an accreditation visit could be scheduled. If the requested information is not received within a further period of one (1) week, the application shall be deemed to have been withdrawn.

The Evaluation Panel (Visiting Team) appointed by the IESLAB, would normally meet four – five (4-5) weeks prior to the accreditation visit. The purpose of the meeting is to provide an opportunity for panel members to share their initial findings after consideration of the submitted documentation. It also enables the panel to collectively identify matters targeted for detailed investigation during the accreditation visit and to identify any additional data or materials that may be required in order to facilitate the evaluation process. The panel will also discuss a draft schedule for the visit proceedings.

A brief meeting report will be normally be compiled, recording any issues of concern, key matters to be addressed during the visit and any request by the panel for additional supporting information. This report will be sent to the engineering school for advice. This requested material must be received at least one (1) week prior to the accreditation visit.

Included with the meeting report will be a draft visit schedule detailing various sessions and activities proposed for the visit. This schedule will be subsequently finalised in negotiation with the University. The University will be asked to append to the final visit schedule the venue details for each session and a listing of the names, titles and affiliations of members of the senior leadership team, the academic staff and the external constituents who will be attending sessions with the panel. A reminder that the all sessions with the evaluation panel should be a single location to minimise time being wasted moving around the campus. The only exception to this would be the laboratory and facility tours, and the meeting with the Vice Chancellor.

A meeting of the Evaluation Panel will normally be held on the evening prior to the commencement of the accreditation visit. This meeting will enable the panel to make final preparations for the visit, to consider any additional supporting information submitted by the educational institution and to prepare strategic questions in readiness for each of the visit sessions

The full cost of accreditation must be borne by the University / Faculty requesting accreditation for the programme.

6.2 ACCREDITATION VISIT

The Evaluation Panel makes the accreditation visit to the University /Faculty / Department that offers the programme. The visit will normally extend over a period of two and a half (2.5) days during which the visiting team gets an opportunity to assess qualitative factors such as intellectual atmosphere and morale in the Faculty / Department, professional attitudes and the quality of staff and students. During this visit the team gets the opportunity to carry out the following activities.

- Interviews with senior administrative officers including the Vice-Chancellor, the Dean of Engineering and the Heads of the Departments responsible for conducting the programme of study.
- The Head of Department or Dean is able to make a 5 minute presentation only, summarising, but not repeating the submission documentation.
- Interviews with members of the academic staff to evaluate professional attitudes, motivations, morale and their opinions on the theoretical and practical elements of the curriculum.
- Interviews with students, individually and in groups.
- Interviews with non-academic staff to assess their competence is supporting the academic programmes
- Visits to physical features such as laboratories, workshops, libraries and computing facilities to evaluate their adequacy and effectiveness.
- A review of recent examination question papers, laboratory instruction sheets, student transcripts (anonymous, if necessary), student reports, models or equipment constructed by students, and any other evidence of student performance for every module covered in the programme.

At the end of the visit, the visiting team will meet only with the Dean of Engineering, and the Heads of the Departments responsible for conducting the programme, to review the perceived strengths and weaknesses of the programme. This is not a presentation to the entire academic staff.

6.3 REPORT OF THE VISITING TEAM

The visiting team shall prepare a report of their findings on the programme of study and present to the - IESLAB within a period of eight (8) weeks after the date of the visit (Appendix C). This report covers perceived strengths and weaknesses of the programme, areas in which it conforms to and deviates from the Board's accreditation criteria, as interpreted by the team, with recommendations on matters of concern and suggestions for improvement. This report should not include any recommendations to the Board regarding accreditation.

Eight (8) weeks after the date of the visit, the visiting team's findings, as outlined in their report, are sent to the University / Faculty concerned by the Board Secretariat for their comments, and to ensure accuracy and completeness. The response of the University / Faculty must be received by the Board Secretariat within a period of four (4) weeks.

The visiting team will also prepare the Summary Accreditation Report (Appendix D), which includes the recommendations to the Accreditation Board. The revised Appendix C and Appendix D will then be submitted to the IESL Accreditation Board.

6.4 ACCREDITATION DECISION

The IESLAB makes a recommendation on accreditation to the IESL by considering the documentation provided by the University / Faculty, the visiting team report, any further clarifying correspondence and the Summary

Report (Appendix D) prepared by the visiting team. The IESLAB may not necessarily agree with the recommendations of the Panel in the Summary Report.

The IESLAB may recommend one of the following.

- To grant full accreditation for a period of five (5) years.
- To grant conditional accreditation for a shorter period (not more than two years) subject to receipt of a report that convinces the IESLAB that matters giving rise to its concerns have been adequately resolved. After reviewing this report, the IESLAB may recommend extending the accreditation to the full five (5) years, or to terminate conditional accreditation at the end of the period granted.
- To decline or terminate accreditation, depending on whether it is a new programme or an already accredited programme.

Based on the recommendation made by the IESLAB, the IESL makes its decision on accreditation of the programme of study concerned.

Notwithstanding the above three alternatives, the IESL may grant recognised degree status to a particular programme of study, stipulating certain conditions to be met by the graduates in order to obtain "Associate" status in the Institution.

The Institution's decision is conveyed to the University through the Dean of Engineering, who will be provided with a comprehensive explanation for it. The University is expected to inform the staff and the students of the accreditation process and the accreditation status of the programme of study.

When a particular programme of study is offered at different locations and / or through different modes of delivery, accreditation status will apply only to the location and / or mode of delivery that has been reviewed. A separate application needs to be made in respect of the same programme offered at another location and / or through a different mode of delivery.

6.5 FORMAL REVIEW

In the event of a decision by the IESL to terminate the accreditation of a programme or to decline accreditation to an unaccredited programme, the University / Faculty may appeal to the President of IESL for a formal review of its decision. This appeal must be made within four (4) weeks of receiving the decision of the IESL. The IESL will then instruct the IESLAB to subject the programme to a second evaluation visit by a newly constituted visiting team. The same accreditation procedure will be followed by the new visiting team, which will report to the IESLAB for a recommendation to the IESL.

6.6 APPEALS

The University / Faculty may appeal against a decision not to accredit. The appeal must be made in writing to the IESL Executive Secretary, within two weeks of receiving the decision, and must state the grounds on which it is based. Grounds for appeal are normally limited to errors of fact or breach of the Policy, Criteria and/or Procedures set down in this document.

The IESL Council will appoint a sub-committee to consider the matter and, if appropriate, conduct a further evaluation visit. Following the report of the sub-committee, the Council's decision is final.

6.7 INFORMAL EVALUATION OR VISIT

A university / faculty may request the IESLAB for an informal evaluation of a proposal for a new programme of study at an appropriate time during its development stage. The Board will arrange an informal visit by a team for the purpose of providing comments and advice to the University / Faculty with respect to the programme. However, no assurance will be given by the IESLAB as to the eventual accreditation of the

programme. The visiting team will present a report to the University / Faculty, but no report will be presented to the IESLAB. The cost of such evaluation / visit shall be borne by the University / Faculty concerned.

6.8 PUBLICATION OF ACCREDITATION STATUS

The IESL will publish a list of accredited programmes of study, together with their effective dates, on an annual basis. The list maintained by the IESL includes only those programmes, which have received full accreditation. This list is available on request.

The records and deliberations of the IESLAB and the IESL concerning accreditation of a programme of study shall be kept confidential.

7.0 REFERENCES

The Institution of Engineers, Sri Lanka gratefully acknowledges the information contents taken from the following sources:

- Board of Engineers, Malaysia
- Canadian Council of Professional Engineers
- The Institution of Civil Engineers, UK
- The Institution of Engineers, Australia
- The Institution of Engineers, Malaysia
- The Institution of Engineers, South Africa
- The Institution of Mechanical Engineers, UK
- The Institution of Professional Engineers, New Zealand

APPENDIX A

APPENDIX A

DOCUMENTS TO FOR ACCREDITATION

A.1 INTRODUCTION

The documents as prescribed below must be submitted in respect of the programme being accredited. It is the responsibility of the University / Faculty to provide accurate information and sufficient evidence for the purpose of evaluation.

The documents must contain information on, but not limited to the following:

- general information and the objectives and outcomes of the programme;
- the ways in which the programme achieves the objectives, including development of the generic graduate attributes and the attributes appropriate to any specialist title, and assists each student to meet the required outcomes;
- teaching staff and students;
- teaching facilities;
- assessment and quality management system, and how it ensures that each graduand has met the required outcomes;
- the methods used to secure external validation and critical comment on the programme objectives and outcomes, and to apply such comment to the continual improvement of the programme and the Faculty, and evidence of their effectiveness;
- any other relevant information.

It should not be necessary to develop extensive documentation specifically for the purpose of accreditation. The purpose of accreditation is to evaluate the systems already in place, not to require their creation. In a well-managed university, most of the documentation requested should already exist.

An acceptable submission is likely to comprise a collection of existing documents, including a text providing a coherent overview. The overview text should address each of the criteria, and refer to the relevant supporting material to the extent that existing documentation provides evidence that the criteria are met.

Submission must be comprehensive, easily readable, and free-standing. The overview text must address each major point in a definitive way. It will not be sufficient merely to provide a collection of disparate items, or point to a web site, and leave the Board to find the relevant information and make the connection for itself. Supplementary information (such as QA policies, staff CVs, module outlines etc) can be provided on a CD.

A.2 DOCUMENTS TO BE SUBMITTED

The Faculty offering the programme should submit five (5) copies of documents based on Section A.3 for accreditation. The submitted documents should be concise, but of sufficient depth and detail, preferably not exceeding fifty pages. Other detailed information should be included as appendices. Documentation should be bound in one or more volumes for convenience and should include a Table of Contents.

The documents should also include:

- The University Calendar;
- The Handbook, Calendar supplement, or other official publication relating to the Engineering Faculty, and containing the public statement of programme's details; and
- University / Faculty/ Department prospectus.

Alternatively, this document could be sent in electronic format, or as a mix of both.

The Board / Panel may at any stage request further information. If the submitted documents do not meet these guidelines, the applicants may be asked to re-apply and submit new documents.

A.3 INFORMATION TO BE MADE AVAILABLE

As a guide for the applicants, the following sections describe the format of information to be made available to the Panel. Additional information may be provided in support of the application.

For the Evaluation Panel visit the following information must be made available:

- Copies of all current promotional literature
- A list showing the name/s of the staff member/s currently responsible for delivery of each academic module
- For a full range of example academic modules at each year level and for each module, a dossier of materials including the module outline document distributed to students, examples of teaching materials and resources, examples of formative and summative assessment materials including examination papers, and specifications for assignments, projects and laboratory activity, examples of a range of graded student work including submissions and examination scripts, journals and portfolios, professional practice log books. Examples of low, medium and high achievement should be available, demonstrating a distinction in grading across the various performance thresholds. A full list showing the range of grades awarded for this module last time it was run.
- Of particular interest are graded student design and project reports/thesis submissions at various year levels.

Displayed materials should be organised clearly against year levels and the records for each academic module separately identified. The range of displayed materials should be selected in order to demonstrate the delivery of the full range of generic capabilities in graduates including a clear indication of the standard of technical competence.

- Prime documentation associated with teaching and learning planning, review, management and quality improvement should be made available. Any appropriate records of formal proceedings, reports and submissions, trend and data analysis, quality system records or evidence of action implemented should be presented for perusal. This should include records of meetings of programme teaching teams, staff-student consultative forums, industry consultative committees body meetings, key documents associated with formal programme reviews as well as appropriate meeting records and documented action follow-ups at all organisational levels.
- Details of any stakeholder surveys including teaching quality and module/programme evaluations, student destination surveys, employer or graduate surveys. As well as access to the survey instruments, any outcome summaries, subsequent reporting, follow up action and information describing influences this data has had on the continuous improvement processes should be presented.
- Available department and/or research annual reports.
- Access to the department's records management system.
- Access to the institution's and/or engineering department's human resource policy documents, including:
    - appointment and tenure (an example of selection criteria would be welcome);
    - promotion (an example of promotion criteria would be welcome);
    - professional development – as an engineering academic and professional educator;
    - supervision and staff counselling;
    - appointment, training, supervision and counselling of sessional staff; -any merit-based reward systems.

A.3.1 Organisation of the University

Outline the organisational structure of the University, including:

A.3.1.1 Title and name of Chief Executive Officer of the University (e.g. Vice-Chancellor);

A.3.1.2 Name of the principal academic entity responsible for engineering education (e.g. Faculty of Engineering) hereinafter called the Faculty, names and relative sizes of comparable entities in other disciplines;

A.3.1.3 Title and name of the Head of the Faculty (e.g. Dean of Engineering); and

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A.3.1.4 Title and name of person at corporate level to whom the Head of Department reports (e.g. Dean of Engineering).

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

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

Statement of whether the University 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).

A.3.2 Organisation of the Faculty

Describe the organisational structure of the Faculty including:

A.3.2.1 Titles and names of officers having responsibility across the Engineering Faculty (e.g. Dean, Faculty Registrar etc);

A.3.2.2 Names of sub-entities (e.g. Department of Civil Engineering) and scope of their responsibilities;

A.3.2.3 Titles and names of the Heads of the sub-entities; and

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A.3.2.4 Accountabilities in relation to educational programmes and to staff supervision.

A.3.3 General Information on the Programme to be Accredited

A.3.3.1 Title of Department:

A.3.3.2 Name of Head of Department:

Contact name / e-mail for visit if different from Head of Department:

A.3.3.3 Address of Department

Tel:

Fax:

e-mail:

A.3.3.4 Staff Member(s) Responsible for the Submission

Name of Main Contact(s) for the Programme(s):

Tel:

Fax:

e-mail:

(if different from A.3.1.4)

A.3.3.5 Date of Submission

A.3.3.6 Visit Date:

(if not yet agreed, leave blank)

A.3.3.7 Names of Current / Most Recent External Examiners since the last accreditation (Include affiliation of examiners)

A.3.3.8 Responses to Previous Accreditation Recommendations

(a.) Give the date of the last accreditation visit and your response to any conditions or recommendations attached to the last accreditation and how you have dealt with them.

A.3.3.9Programme Development Since Last Accreditation

(a.) Describe any major changes made to the Programme(s) since that date and give the date they were implemented. (Include changes such as conversion to modules and semesters)

Date:

Major Changes:

A.3.4 Programme Information

(A separate submission of Section A.3.4 is required for EACH programme for which accreditation is being sought but cross referencing of information should be used wherever possible)

A.3.4.1(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			

A.3.4.1(c) Franchise Arrangements

(i) Please give the name and address of the institution where the programme is franchised, year(s) of the programme that is / are franchised, period of study in the franchised institution

(ii) If majority of study is in a franchised institution does the Degree Certificate specify where the study was undertaken?

A.3.4.1(d) From which Professional Institution(s) is accreditation being sought?

1.Institution of Engineers, Sri Lanka

2.

3.

A.3.4.2 Mission, Objectives and Outcomes of the engineering technology degree programme

State the mission and the programme objectives and relate how the programme objectives and programme outcome are consistent with IESL criteria on graduate abilities listed under 5.5.

A.3.4.3 Programme Structure

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

A.3.4.4 Foundation Year / Access Year / Year 0:

Is there a Foundation or Access Year or a Year 0? (if yes, state which)

If so, is this programme Full-time or Part-time?

(a.) Is the Foundation year franchised? - If so, give details of the franchise arrangements

(b.) Please provide a brief outline of programme indicating how the curriculum matches the GCE (Adv. Level)standard, particularly in mathematics and physical sciences

(c.) Provide a brief description of the scheme of assessment for any Foundation Programme including student's

entry requirements, external examiner involvement, quality assurance procedures and referral procedure

(d.) Give details of the standard required for admission from the foundation year to the first year of the accredited degree programme(s). Please give the total number of students who complete the foundation year, the number who satisfy the degree entry standard and the number admitted to each degree programme for which accreditation is sought, for the last three intakes

(e.) Provide a diagram to show the progress of the previous three cohorts from the Foundation Year at the end of Year 1 of the degree (assessed against students with GCE 'A' level qualifications)

A.3.5 Programme Content

A separate submission of Section A.3.5 is required for EACH programme and for EACH year for which accreditation is being sought, however, please cross-reference information wherever possible)

A.3.5.1 Curriculum

Degree: …… **Year ……**

SUBJECT (indicate core subjects options, project type)	Timetabled work in hours per week				No of teaching weeks	Total hours	Number of examination papers			Grades / maximum marks available from			
	Lectures	Tutorials	Laboratory work	Others, e.g. seminars, major project work			Externally assessed	Others	Exams	Coursework		Other assignments	
										Work assessment	End /phase tests	Lab.	Project/ seminars
TOTALS:													

A.3.5.2 Syllabi / 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. 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.3.5.3(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 are the implications for a student who fails a final year project?

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

A.3.5.3(b) Comprehensive Design Projects - Group Projects

Provide details of the Comprehensive Design Projects. State the average number of students in each group and show the 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.

A.3.5.54 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.

A.3.5.5 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

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A.3.5.6 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

A.3.5.7 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 provision by the University for students to obtain relevant experience off the campus. How do these experiences contribute to the 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 structure these experiences are provided, for the last twelve months.

A.3.5.8 Industrial Training, Placements / Experience, Sandwich Year

(a.) 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 placement or gain industrial experience?

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

Industrial Experience - Full-time Programme	**200_**	**200_**	**200_**
Number of students on full-time programme who have not 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 (including Mahapola and other scholarships)

Sponsored Students	**200_**	**200_**	**200_**

A.3.5.9 Industrial Consultative Committee (ICC)

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 Lectures and state whether attendance is compulsory

A.3.5.10 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?

A.3.5.11 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.

A.3.5.12 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

A.3.6 Entry Standards

A.3.6.1 Published Requirements

Give the published entry qualifications requirement

A.3.6.2 Student Entry Qualifications

(a.) Please give, for each of the last three years, the actual qualifications and subjects of each student admitted to each programme. Give details of the qualifications offered by overseas students. Show separately the number

of students with GCE 'A' Levels. (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

A.3.6.3 Non 'A' Level Qualifications

Comment on any problems encountered with the standard of students entering with non 'A' Level qualifications, and the steps taken to overcome them

A.3.6.4 Direct Entry to Second or Higher Years

Give the qualifications required for direct entry to each year of the programme other than the first year. Provide information on the credit transfer policy applicable to these students.

A.3.6.5 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

	200_	**200_**	**200_**
1.Total number of applicants			
2.Number of students interviewed			
3.Offers made			
4.Planned intake			
5.Actual intake			

A.3.7 Progression and Classification

A.3.7.1 Progress through the programme

Please complete a flow diagram showing the last three complete cohorts through the system and a separate sheet for the 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 diagram)

A.3.7.2 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, predetermined boundaries as percentage marks, performance criteria for individually assessed items.

A.3.8 Student Membership Status and Destination

A.3.8.1 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?

200_			200_			200_		
Inst./Soc.	**Number**	**Percent**	**Inst./Soc.**	**Number**	**Percent**	**Inst./Soc.**	**Number**	**Percent**

A.3.8.2 Departmental Staff / Student Committee

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

A.3.8.3 Destination of Graduates

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

	200_	**200_**	**200_**
1. Permanent employment in engineering, computer science or 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			

A.3.9 Staff

A.3.9.1 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 consultancies

Name	Present post & date of joining establishment	Academic Qualifications	Membership of Professional Bodies or Societies	Professional Duties (eg External Examiner)	Brief résumé (with approx. dates of industrial experience incl. any current activities	Present teaching subject(s) and student contact hours per year	Research		
							a	b	c

A.3.9.2 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

A.3.9.3 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?

A.3.9.4 Student / Staff Ratio

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

EQUIVALENT FULL TIME ACADEMIC STAFF TO STUDENT RATIO	
A) Total number of full time active staff for undergraduate teaching into this programme (Note: this does not include staff on study or sabbatical leave or research only staff)	
B) Full time equivalent of academic staff from other programmes servicing this programme	
C) Full time equivalent of part time academic staff servicing this programme	
D) Total Full time equivalent academic staff = A + B + C	
E) Total Full time equivalent students	
F) Full time equivalent staff to Student ratio = D:E	

A.3.9.5 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 support staff (R). In a large department, a summary by grade will suffice

Name	Qualifications

A.3.10 Research, Consultancy and Postgraduate Programmes

A.3.10.1 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 influence teaching and student work

A.3.10.2 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 influence teaching and student work

(The information in A.3.10.1 and A.3.10.2 may be presented in any format suitable to the Department, provided it is brief. However, item (iii) should be included on this submission form. For a large Department a summary is acceptable.)

A.3.10.3 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.

A.3.11 Resources

A.3.11.1 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 year projects and comprehensive design projects.

Resources – Provide brief details	Access (availability other than for timetabled work i.e. evenings, weekends)
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 projects, data projectors etc**	**Access** (availability other than for timetabled work i.e. evenings, weekends)
Study Rooms	
Lecture Rooms	

A.3.11.2 Income to Support the Teaching Programme

Please give figures for the last five years

	200_	**200_**	**200_**	**200_**	**200_**
Income					
Government					
Research / Consultancy					
Other					
Total					

A.3.11.3 Resource Changes

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

A.3.12 Quality Assurance and Systems

(i).Give a brief statement on teaching quality assurance procedures within the Department and state how they relate to 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.) programme review procedure;
(c.) moderation of examinations, students' work, including monitoring and feedback;
(d.) the role of the External Examiner

(ii). Provide records of the examination, curriculum development or other meetings as evidence on how QA procedures 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.

A.3.13 Future Plans

A.3.13.1 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?

(Changes to the curriculum that are agreed department policy and to be implemented within the period for which accreditation is being sought should appear in Section 3).

A.3.14 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 strategies for 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.

A.3.15 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 of programmes undertaken.

APPENDIX B

APPENDIX B

ACADEMIC PROGRAMME CONTENT

(a) Engineering Science and Principles

Accredited programmes will be expected to cover, at an appropriate level, the broad areas of:

CIVIL	MECHANICAL	PRODUCTION	ELECTRICAL	CHEMICAL	ELECTRONIC	COMPUTER	TEXTILE & CLOTHING	EARTH RESOURCES	MATERIALS
Strength and properties of materials	Manufacturing systems and industrial engineering	Manufacturing systems and industrial engineering	Circuits and systems	Chemical thermodynamics and kinetics, Process stoichiometry	Signals and systems	Computer systems	Properties of textile materials	Exploration, mining and testing of earthen materials	Engineering materials, Mechanics of materials
Applied mechanics: Statics and dynamics	Mechanics of machines and control systems	Mechanics of machines and control systems	Electrical machines and drives	Transport phenomena, Heat, mass and momentum transfer	Electronics(analog, digital and physical)	Software engineering	Yarn and fabric manufacture	Applied mechanics	Applied mechanics: Dynamics
Structural analysis and design	Mechanics of solids	Manufacturing technology	Electrical power systems	Separation process and particle technology	Communication systems	Operating systems	Textile engineering	Structural analysis of minerals	Mechanical behaviour of materials
Fluid mechanics and hydraulic engineering	Fluid mechanics	Production planning and control	Electronics principles and power electronics	Chemical reactor engineering	Wave propagation	Computer architecture	Chemical processing of textiles	Remote sensing and GIS	Fluid mechanics and thermodynamics
Soil mechanics and geotechnical engineering	Thermodynamics	Thermodynamics	Computer systems, fields and waves	Process analysis and control, Safety analysis and control	Computer systems	Computer networks	Computer systems, fields and waves	Geology	Electrical &magnetic properties of materials
Construction planning, technology and management	Machine elements and design	Machine elements and design	Control systems	Material science and technology	Control systems	Theory of electricity, Principles of electronics	Textile testing and quality control	Gemmology	Failure analysis and selection of materials

Alongside these basic subjects, there must be a study of the principles and applications of:

CIVIL	MECHANICAL	PRODUCTION	ELECTRICAL	CHEMICAL	ELECTRONIC	COMPUTER	TEXTILE & CLOTHING	EARTH RESOURCES	MATERIALS
Geology	Energy and the environment	Industrial automation	Power system analysis	Material and energy balance flow sheeting	Electronic system analysis and design	Object oriented programming	Control systems and automation	Hydrology	Materials and ceramic sciences
Environmental engineering	Electrical power and machines	Electrical power and machines	Electrical drives and applications	Polymer science and engineering	Computer architecture	Databases	Yarn and fabric Mechanics	Mining Methods	Characterisation of materials
Highway and transportation engineering	Measurement and Instrumentation	Engineering measurements	Measurement and instrumentation	Plant and equipment design, Piping and instrumentation	Electronic measurement	Data communication	Financial management, Human Resource management	Mine Ventilation	Process and Polymer Engineering
Water resources	Electronics and microprocessors	Plant layout	Electrical protection systems	Energy systems – conservation and management	Electronic control and instrumentation	Microprocessor based systems	Non-wovens and technical Textiles	Rock blasting	Ferrous/non-ferrous metals and alloys
Surveying	Automobile engineering	Management principles	High voltage Engineering	Biotechnology, Biochemical and food process engineering	Internet technology and applications	MIS and professional practice	Environmental Management	Surveying, Environmental aspects	Design and fabrication of polymer products
Project management	Computer aided design	CAD/CAM	Electrical energy utilisation	Viability, legal framework and reliability		Data structures and algorithms	Operations management and MOT	Mine management	Degradation of materials

These are supporting studies without which an engineer will lack some of the understanding, which is necessary to be able to practice effectively across a broad spectrum of industries and functions.

(b) Mathematics, Statistics and Computing

These subjects should be studied to a level necessary to underpin the engineering subjects of the programme and with a bias towards application in the teaching. The use of numerical methods of solution is encouraged, with an appreciation of the power and limitations of the computer for modelling engineering situations. Wherever practicable, it is preferred that mathematics, statistics and computing be taught in the context of their application to engineering problems, and it follows that some mathematical techniques may be learnt within other subjects in the programme. In addition to the use of computers as tools for calculation, analysis and data processing, courses should introduce their application in such areas as:

CIVIL	MECHANICAL	PRODUCTION	ELECTRICAL	CHEMICAL	ELECTRONIC	COMPUTER	TEXTILE & CLOTHING	EARTH RESOURCES	MATERIALS
Computer aided analysis and Design	Computer aided design and manufacture	Computer aided design and manufacture	Mathematical applications	Computer aided analysis and design	Mathematical applications	Mathematical applications	Computer aided design	Computer aided analysis and design	Computer aided analysis and design
Economic analysis for decision making	Numerical methods	Numerical methods	Statistical techniques	Economic analysis for decision making	Statistical techniques	Statistical techniques	Statistical techniques	Economic analysis for decision making	Economic analysis for decision making
Database management	Programming techniques	Programming techniques	Computer aided design	Databases and information systems	Computer aided design	Numerical computations	Information systems	Database Systems	Database Systems
Management information systems	Operational Research	Operational Research	Electrical properties of materials	Operational research	Software engineering	Automation	On-line control of production systems	Mine development	Operational research
Business and management systems	Industrial economics and management	Industrial economics and management	Management systems	Business and management systems	Management systems	Systems analysis and design	Management and marketing systems	Management systems	Management systems
Statistical techniques	Mechatronics	Production cost analysis	Numerical computation	Numerical methods	Numerical computation		Operational research	Numerical computations	Numerical computations

(c) Engineering Applications - Materials, Design, Manufacture, Construction

Emphasis on engineering applications in a degree programme aims to ensure that all engineering graduates have a sound understanding of up-to-date industrial practice, and in particular:

Civil Engineering

- To appreciate the characteristic and structural behaviour of materials in a variety of user environments;
- To be able to analyse and design structural components from these materials;
- To appreciate the range of construction methods currently available and the skills which they require in people;
- To appreciate the cost aspects of material selection, construction methods, operation and maintenance in their interaction with design and product marketing;
- To understand the whole process of industrial decision-making in design, construction and use, and how it can be influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

Mechanical engineering

- To appreciate the characteristic behaviour of materials in a variety of user environments;
- To appreciate the range of manufacturing methods currently available and the skills which they require in people;
- To appreciate the cost aspects of material selection, manufacturing methods, operation and maintenance in their interaction with design and product marketing to understand the whole process of industrial decision-making in design, manufacture and use, and how it can be influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

Production Engineering

- To appreciate the characteristic behaviour of materials in a variety of user environments;
- To appreciate the range of manufacturing methods currently available and the skills which they require in people;
- To appreciate the cost aspects of material selection, manufacturing methods, operation and maintenance in their interaction with design and product marketing to understand the whole process of industrial decision-making in design, manufacture and use, and how it can be influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

Chemical engineering

- To appreciate the characteristic and structural behaviour of materials in a variety of user environments;
- To be able to adopt these materials in process design and analysis;
- To understand the general sequence of processing steps for any given type of chemical process;
- To calculate and analyse the material and energy flows for a given chemical process;
- To understand the selection or estimation of process operating conditions, selection of process equipment, maintenance and process troubleshooting;
- To analyse the various types of unit operations and processing steps, and to decide on their relative advantages and disadvantages on the basis of environment, economics, safety and operability;
- To understand the various process control schemes for the purpose of maintaining production quality, ensuring process safety and preventing waste.

Electrical and Electronic engineering

- To appreciate the characteristic behaviour of materials in electrical and electronic systems;
- To be able to analyse and design electrical and electronic systems from devices / components made of various materials;
- To appreciate cost effectiveness of component / device / equipment / material selection, manufacturing process and integration process, operation and maintenance;
- To appreciate the range of manufacturing and processing methods currently available and the skills which they require in people;
- To understand the whole process of industrial decision-making in design, manufacture and use, and how it can be influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

Computer Science and Engineering

- To appreciate the characteristic behaviour of hardware, software and networking systems;
- To be able to analyse and design hardware, software and networking technologies, and to use them in the design of information systems to achieve required goals;
- To appreciate the range of methodologies available for the development of hardware, software and networking systems;
- To appreciate the importance of improving performance of hardware, software and networking systems;
- To understand the process of information technology, and how it can be influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

Textile and Clothing Process Engineering

- To appreciate the characteristics and structural behaviour of textile materials;
- To be able to use textile materials in analysing, designing and fabricating textile structures;
- To appreciate the range of manufacturing and processing methods currently available, and the skills they require in people;
- To understand the general sequence of processes and material flow of any textile / clothing manufacturing system;
- To understand the various process control schemes for the purpose of maintaining quality of production and optimising production;
- To understand the whole process of industrial decision making in the analysis, design, manufacture and use, and the influence of constraints such as financial, human and environmental, on the decision making.

Earth Resources Engineering

- To appreciate the characteristic behaviour of earth resources in a variety of user environments;
- To be able to understand the general sequence of steps in the processing of earth resources;
- To appreciate the range of mining, processing and testing methods currently available, and the skills that they require in people;
- To analyse and design ventilation systems for underground mines;
- To understand the environmental effects of mining and the mitigatory measures, surveying, remote sensing and GIS applications for decision making, and how it can be influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

Materials Engineering

- To be able to understand the structure-properties relationship of engineering materials and the basics of materials science in order to predict performance at the design, manufacture and in-service stages in the core areas of polymers, ceramics, metals and composites;
- To be able to apply scientific and engineering principles to ensure that materials are selected, processed, fabricated and used to achieve their intended performance;
- To appreciate the materials process technology with cost effective materials selection, manufacturing methods, product design and marketing and industrial maintenance;
- To develop competence in laboratory work, ability to use information technology and a high level of skills in communication and presentation;
- To understand the industrial environment for decision making, and how it can be influenced not only by technical ideas but also by the practical constraints of financial and human resources and by the business and social environment of engineering.

APPENDIX C

APPENDIX C

REPORT OF THE EVALUATION PANEL

In addition to the summary as given in Appendix D, a separate accreditation panel report as detailed below is to be submitted:

C.1 GENERAL INFORMATION

- Panel membership: Chairman and Panel Members;
- Name of the University seeking accreditation for a programme;
- Name of the Faculty;
- Name of the Department;
- Date of submission of request for accreditation;
- Date of receipt of initial documentation.

For each programme evaluated:

- title of programme;
- degree awarded on completion, with abbreviation;
- University awarding the degree, if different from above;
- level of accreditation sought;
- year of first introduction of the programme, and year of major revisions; and
- year of last accreditation assessment, and outcome.

C.2 ACCOUNT OF PROCEEDINGS

Date(s) of visit(s) to the University, and a brief account of the proceedings: meetings with staff, students, constituents, facilities and materials inspected, points noted in the process.

C.3 ACTION SINCE LAST ACCREDITATION

Provide a response to all the recommendations made by the previous evaluation of a programme or programmes. Detail the action taken by the University and results.

C.4 COMMENDATIONS

The Panel will highlight any outstanding areas/aspects of the programme being assessed.

C.5 EVALUATION AGAINST CRITERIA

The Panel's final evaluation of compliance with the criteria, after taking account of the University's response to the draft report, under the following headings and in relation to all modes in which each programme is offered, namely,

(a) Programme objectives and outcomes

- The objectives are well stated, likely to be meaningful to students and employers, and consistent with the mission of the University and with the expectation of a professional engineering degree.
- The programme title properly reflects its objectives and is professionally appropriate.
- The obtainment of the programme outcomes can be clearly demonstrated by all graduates, i.e. this is proven by the links between the programme outcomes, the module outcomes and the module assessment.

(b) Programme structure

- The programme structure is consistent with Section 5.0.
- The programme structure at introductory level is compatible with students' backgrounds at entry.
- Descriptions of subjects and other elements are adequate, for all modes and pathways.
- Arrangements for exposure to professional engineering practice meet Sections 4.3 and 5.0.

C5.B1COURSE CONTENT - QUANTITY

	Credits	**Remarks**
(a) Engineering Subjects:		……..
(b) Laboratory Work:		……..
(c) Industrial Training:		……..
(d) Final Year and CPD Projects:		……..
Total Credits in Category A1:		

- **C5.B2**

	Credits	Remarks
(a) Applied Science / Maths / Computer		……..
(b) Management / Law / Accountancy:		……..
(c) Communication Skills / Humanities / Ethics		……..
(d) Non-technical / Co-curriculum		……..
Total Credits in Category A2:		
Total Credits in Categories A1 and A2:		

Important Note: The minimum number of credits for an engineering technologist programme with entry qualification of GCE 'A' level or equivalent is a total of 108 credits of which 72 credits must be subjects in Category C5.B1 above. The accreditation exercise shall be carried out only if both requirements are met.

(c) Educational process

- Curriculum design is effective in addressing each of the generic graduate attributes (Section 4.2).
- Curriculum justifies any specialist title carried by the programme and is effective in imparting appropriate attributes and specialist knowledge.
- The programme outcomes in relation to professional engineering practice are appropriate and the curriculum provides adequate means for students to attain these outcomes.
- Arrangements for programme delivery and student support, including staffing arrangements, are adequate.

(d) Assessment

- The assessment processes effectively measure the outcomes of the programme as a whole and their relationship to the stated objectives and the generic and specialist attributes.
- The assessment processes are properly moderated to ensure consistent standards
- Clear processes exist for the assessment of individual students undertaking group work, particularly with the final year project and comprehensive design project.
- An appropriate variety of assessment processes and opportunities are employed, consistent with Section 5.4.
- The assessment processes adequately ensure that each individual graduate has met the degree requirements and stated programme outcomes.
- The criteria and processes for the award of honours are appropriate.

(e) Educational culture

- There is clear evidence of a forward-looking, proactive educational culture and awareness of current developments in engineering education by all staff.
- Approaches to curriculum design and delivery and to assessment are holistic, and not fragmented.
- Staff are active in role-modelling the generic attributes of an engineering technologist.
- There are active programmes in place to promote the objectives and also community consciousness, nationalisation and internationalisation.

(f) Quality systems

- Processes for programme planning and curriculum development and review are appropriate, and involve all academic staff.
- For a new programme, the rationale for its introduction, and evidence of demand and of availability of resources, are adequate.
- There is clear evidence that the results of assessment of student performance and learning outcomes are being applied to the review and ongoing improvement of programme effectiveness.
- There are effective processes for securing feedback from all programme constituents and applying it to the review and ongoing validation and improvement of programme objectives, curriculum, assessment and quality of learning and teaching. The results of this feedback must be reported back to all stakeholders.
- There are effective advisory mechanisms for consulting and involving practising engineering technologists and leading employers of engineering graduates in forward planning and quality management.
- There are programmes in place or under active development, for benchmarking programme standards against those of other universities, nationally and / or internationally.
- Graduate employment data and alumni and employer feedback are available and give confidence in the programme, the Engineering Faculty and the capability of its graduates.
- The Faculty has an effective records management system

(g) Programme administration and statistics

- Admission policies are appropriate and consistent for students from all backgrounds.
- Policies on advanced standing and credit transfer are clear
- Student numbers and estimated forward trends are adequate for a viable programme.
- Arrangements for progression, graduation and the award of honours appear appropriate.

(h) Operation environment

- Organisational arrangements in the University and the Engineering Faculty are consistent with Sections A.3.1 and A.3.2 in Appendix A.

- Evidence of long-term commitment and forward planning are consistent with Section A.3.1in Appendix A.

(i) The staff

- The qualifications, experience, and professional standing of the staff are appropriate.
- The overall staff profile demonstrates a capability to meet the objectives of the programme and the Engineering Faculty, and appears to be adequately distributed in relation to the programme / teaching commitments.
- The staff members are competent to cover all curriculum areas in relation to the programme(s) to be accredited, including those relating to any specialist title.
- There are adequate arrangements in place to assure the quality and capability of staff or provide from outside the University who have major responsibilities in relation to the programme.
- Appropriate use is made of visiting staff who provide complementary expertise to that available within the Faculty.
- Policies and practice in relation to staff recruitment, supervision, promotion and workload management are appropriate.
- There are adequate arrangements for the support of visiting staff.
- Staff members are undertaking an appropriate range of professional and educational development programmes.

TEACHING STAFF - GENERAL INFORMATION

1. Number of Academic Staff (full-time)	
2. Number of Academic Staff (part-time)	

Qualifications of Academic Staff:

(a) Highest Academic Qualification

Qualification	Number	Remarks
(i) Doctorate		
(ii) Masters		
(lii) Bachelors		
(iv) Diploma in Education		
(v) Other Qualifications (please specify)		

(b) Professional Qualification (e.g. Registered P.E., Member of Professional Body)

Type of Qualification	Number	Remarks
(i) Chartered Engineers		
(ii) Members of Professional Bodies		

(c) Posts

	Number	Remarks
(i) Professors		
(ii) Associate Professors		
(iii) Senior Lecturers		
(iv) Lecturers		
(v) Instructors / Temporary Instructors		
(vi) Technical Officers		
(vii) Others (please specify)		

Attachment:

List of names of academic staff (both full-time and part-time) with their academic and professional qualification is to be attached separately.

(j) Resources and facilities

- The University's arrangements for funding the University are appropriate.
- Allocation of resources to programmes within the University is appropriate.
- Adequate resources are available to meet the programme objectives. Future trends, or steps being taken to address them, indicate continuing viability.
- Adequate facilities and infrastructure are available to students and staff.
- Sufficient modern facilities are made available for staff and students

(k) Compliance under each heading is evaluated as:

- Total or substantial failure to comply with criteria.
- Significant deficiencies to be remedied before accreditation can be recommended.
- Acceptable level of compliance: shortcomings to be identified and development action recommended.
- Substantial or full compliance. Any shortcoming to be noted and innovations and examples of good practice to be commended.

The Panel provides comments under each heading on identified shortcomings, examples of innovation and good practice, and directions recommended for future development.

C.6 RECOMMENDATIONS

The Panel will provide a series of recommendations intended to assist with the processes of continuing quality improvement and to summarise the outcomes arising from the above discussion.

C.7 REPORT AND UNIVERSITY RESPONSE

The Board refers the report of the Panel to the University / Faculty for clarification / comment on factual matters.

C.8RECOMMENDATION AND COMMENTS

The Evaluation Panel will not make any recommendations regarding accreditation in their report described in this Appendix. However, their recommendations are made in the Summary Report (Appendix D), which is prepared after receiving the response of the University / Faculty to the Panel's report. A recommendation to the IESL will be made by the EAB after considering the report of the Panel, the response to it from the University /Faculty and the Summary Report of the Panel.

APPENDIX D

APPENDIX D

SUMMARY ACCREDITATION REPORT

I. GENERAL INFORMATION

A. UNIVERSITY / INSTITUTION

1. Name of the University / Institution:……
2. Programme for Accreditation:……

B EVALUATION PANEL MEMBERS

1.Chairman:
……
2.Members:
(a)……
(b)……
3.Official (if any):
……

C MEDIUM OF INSTRUCTION AND REFERENCE MATERIALS AVAILABLE

1. Medium of instruction of programme evaluated:……

2.Language of available reference materials:……

2. EVALUATION CRITERION

Overall Comments/Remarks for CRITERION No 1.Academic Programme **Poor/Satisfactory/Good**

Overall Comments/Remarks for CRITERION No 2. Staff and Students **Poor/Satisfactory/Good**

Overall Comments/Remarks for CRITERION No 3. Facilities available in Faculty/Department **Poor/Satisfactory/Good**

Overall Comments/Remarks for CRITERION No 4. Quality Systems **Poor/Satisfactory/Good**

3. EVALUATION PANEL ASSESSMENT REPORT

EVALUATION PANEL ASSESSMENT REPORT SUMMARY

Overall Comments/Remarks:

i) Strengths
ii) Weakness
iii) Concerns
iv) Opportunities for improvement
v) Other comments/remarks

Date of Visit:……

Programme Title:……

Faculty:……

4. RECOMMENDATION BY EVALUATION PANEL

A Full Accreditation ☐ * with / without condition

Conditions to meet:

(i)……

……

(ii)

……

….

B Conditional Accreditation ☐ * with / without condition

Duration ☐ year

Comments, if any

……

Conditions to meet:

(i)……

……

(ii)

……

….

B Recognised ☐ * with / without condition

Duration ☐ year

Comments, if any

……

Conditions to meet:

(i)……

……

(ii)

……

….

D Not Accredited

Comments:

(I)……

……

(ii)……

…….

D Prepared and submitted by Evaluation Panel:

Chairman…….. Signature

……..

(ii) Member…….. Signature

……..

(iii) Member…………………………………………………………………….……….. Signature ………………………………………………………………………………………..

Date ………………………………………………………………………………..

5**. ACTION BY ENGINEERING ACCREDITATION BOARD (EAB)**

A. Date Submitted to EAB:

……..
……....

B. Comments by the EAB:

(i)
……..
……

(ii)
……..
……

(iii)……..
……

(Iv)……..
……

C. Recommendation by Board

Concur with Evaluation Panel * Yes / No

If not agreeable with Evaluation Panel's recommendation, EAB recommendations are:

(i)Full Accreditation	
(ii)Conditional Accreditation	
(iii)Recognised Degree	
(iv)Decline Accreditation	

Conditions to meet:

(i)
……..
……

(ii)
……..
……

(iii)……..
……

…… ……

Date: Signature

Chairman, EAB

6.ACTION BY INSTITUTION OF ENGINEERS, SRI LANKA

A Report presented to the IESL on

……..……..

B Decision of IESL

……..……

C Action to be followed:

(i)……..……
……

(ii)……..……
…..

(iii)……..……
….

……

Signature

Executive Secretary, IESL

Date: ……

7. ACTION BY THE SECRETARIAT

Accreditation Certificate No. …. ……. was issued to the Faculty / Department of ……

the University of…… on : ……

Note: Delete whichever is not applicable

APPENDIX E

APPENDIX E

EXTERNAL EXAMINER'S REPORT

The external examiner's report should contain, but not be limited to, the following:

(i) Assessment of staff quality including qualifications and industrial exposure. Also to assess loading of each staff in teaching, research, consultancy and supervision of student projects.

(ii) Assessment on staff-student ratio. If not sufficient, the corrective action to be taken by the University to correct as noted.

(iii) Assessment on the process of preparation of question papers i.e., procedures for setting, vetting, quality assurance, confidentiality and security.

(iv) Assessment on the question papers and marking schemes set for the last two semesters of the course the standard of questions, coverage of syllabus, adequate balance between theory and application, questions set are of equal level, adequate choice of questions, appropriateness of marking scheme.

(v) Assessment on the marked answer scripts from a sample of good, average and weak candidates. Assessment of the fairness / disparity of marking, whether follow-through method is adopted where one section of the answer is incorrect, the response of the candidates to the questions, the distribution of marks.

(vi) Assessment on coursework, laboratory work, assignments, design projects and final year projects.

(vii) Assessment on examination regulations available.

APPENDIX F

APPENDIX F

INTERNATIONAL ENGINEERING ALLIANCE GRADUATE OUTCOMES EXEMPLAR STATEMENTS AND PROFESSIONAL COMPETENCIES

(As ratified at IEA Biennial meetings Kyoto June 2009)

Washington Accord	4+ year Professional Engineer programs
Sydney Accord	3+ years Engineering Technologist programs
Dublin Accord	2+ years Engineering Associate programs

July 2009

Accord programme profiles

The following tables provide profiles of graduates of three types of tertiary education engineering programmes. See below for definitions of complex engineering problems, broadly-defined engineering problems and well-defined engineering problems.

Knowledge profile

A Washington Accord programme provides:	**A Sydney Accord programme** provides:	**A Dublin Accord programme** provides:
A systematic, theory-based understanding of the **natural sciences** applicable to the engineering discipline focussed on by the programme	A systematic, theory-based understanding of the **natural sciences** applicable to the sub-discipline focussed on by the programme	A descriptive, formula-based understanding of the **natural sciences** applicable in the sub-discipline focussed on by the programme
Conceptually-based **mathematics**, numerical analysis, statistics and formal aspects of computer and information science to support analysis and modelling applicable to the discipline	Conceptually-based **mathematics**, numerical analysis, statistics and aspects of computer and information science to support analysis and use of models applicable to the sub-discipline	Procedural **mathematics,** numerical analysis, statistics applicable in a sub-discipline
A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline	A systematic, theory-based formulation of **engineering fundamentals** required in an accepted sub-discipline	A coherent procedural formulation of **engineering fundamentals** required in an accepted sub-discipline
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.	**Engineering specialist knowledge** that provides theoretical frameworks and bodies of knowledge for an accepted sub-discipline	**Engineering specialist knowledge** that provides the body of knowledge for an accepted sub-discipline
Knowledge that supports **engineering design** in a practice area	Knowledge that supports **engineering design** using the technologies of a practice area	Knowledge that supports **engineering design** based on the techniques and procedures of a practice area
Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline	Knowledge of **engineering technologies** applicable in the sub-discipline	Codified **practical engineering knowledge** in recognised practice area.
Comprehension of the role of engineering in society and identifies issues in engineering practice in the discipline: ethics and the professional responsibility of an engineer to public safety; the impacts of engineering activity: economic, social, cultural, environmental and sustainability;	**Comprehension** of the role of technology in society and identifies issues in applying engineering technology: ethics and impacts: economic, social, environmental and sustainability	**Knowledge** of issues and approaches in engineering technician practice: ethics, financial, cultural, environmental and sustainability impacts
Engagement with selected knowledge in the **research literature** of the discipline	Engagement with the **technological literature** of the discipline	
A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 4 to 5 years of study, depending on the level of students at entry.	*A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 3 to 4 years of study, depending on the level of students at entry.*	*A programme that builds this type of knowledge and develops the attributes listed below is typically achieved in 2 to 3 years of study, depending on the level of students at entry.*

	Attribute	Differentiating Characteristic	… for Washington Accord Graduate	… for Sydney Accord Graduate	… for Dublin Accord Graduate
1.	**Engineering Knowledge**	Breadth and depth of education and type of knowledge, both theoretical and practical	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies.	Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.
2.	**Problem Analysis**	Complexity of analysis	Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.	Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.
3.	**Design/ development of solutions**	Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4.	**Investigation**	Breadth and depth of investigation and experimentation	Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.	Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.

5.	**Modern Tool Usage**	Level of understanding of the appropriateness of the tool	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities, with an understanding of the limitations.	Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering activities, with an understanding of the limitations.	Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering activities, with an awareness of the limitations.
6.	**The Engineer and Society**	Level of knowledge and responsibility	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.	Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice.	Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice.
7.	**Environment and Sustainability**	Type of solutions.	Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.	Understand the impact of engineering technology solutions in societal and environmental context and demonstrate knowledge of and need for sustainable development.	Understand the impact of engineering technician solutions in societal and environmental context and demonstrate knowledge of and need for sustainable development.
8.	**Ethics**	Understanding and level of practice	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.	Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.	Understand and commit to professional ethics and responsibilities and norms of technician practice.
9.	**Individual and Team work**	Role in and diversity of team	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.	Function effectively as an individual, and as a member or leader in diverse technical teams.	Function effectively as an individual, and as a member in diverse technical teams.

10.	**Communication**	Level of communication according to type of activities performed	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	Communicate effectively on broadly-defined engineering activities with the engineering community and with community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions	Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions
11.	**Project Management and Finance**	Level of management required for differing types of activity Note: needs level Statement.	Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a technical team and to manage projects in multidisciplinary environments
12.	**Life long learning**	Preparation for and depth of continuing learning.	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.	Recognize the need for, and have the ability to engage in independent updating in the context of specialized technical knowledge.

Range of Problem Solving

Attribute		**Complex Problems**	**Broadly-defined Problems**	**Well-defined Problems**
1	Preamble	Engineering problems which cannot be resolved without in-depth engineering knowledge, much of which is at, or informed by, the forefront of the professional discipline, and having some or all of the following characteristics:	Engineering problems which cannot be pursued without a coherent and detailed knowledge of defined aspects of a professional discipline with a strong emphasis on the application of developed technology, and having the following characteristics	Engineering problems having some or all of the following characteristics:
2	Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues	Involve a variety of factors which may impose conflicting constraints	Involve several issues, but with few of these exerting conflicting constraints
3	Depth of analysis required	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models	Can be solved by application of well-proven analysis techniques	Can be solved in standardised ways
4	Depth of knowledge required	Requires research-based knowledge much of which is at, or informed by, the forefront of the professional discipline and that supports a fundamentals-based first principles analytical approach	Requires a detailed knowledge of principles and applied procedures and methodologies in defined aspects of a professional discipline with a strong emphasis on the application of developed technology and the attainment of know-how, often within a multidisciplinary engineering environment	Can be resolved using limited theoretical knowledge but normally requires extensive practical knowledge
5	Familiarity of issues	Involve infrequently encountered issues	Belong to families of familiar problems which are solved in well-accepted ways	Are frequently encountered and thus familiar to most practitioners in the practice area
6	Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional engineering	May be partially outside those encompassed by standards or codes of practice	Are encompassed by standards and/or documented codes of practice
7	Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs	Involve several groups of stakeholders with differing and occasionally conflicting needs	Involve a limited range of stakeholders with differing needs
8	Consequences	Have significant consequences in a range of contexts	Have consequences which are important locally, but may extend more widely	Have consequences which are locally important and not far-reaching
9	Interdependence	Are high level problems including many component parts or sub-problems	Are parts of, or systems within complex engineering problems	Are discrete components

Range of Engineering Activities

Attribute		Complex Activities	Broadly-defined Activities	Well-defined Activities
1	Preamble	Complex activities means (engineering) activities or projects that have some or all of the following characteristics:	Broadly defined activities means (engineering) activities or projects that have some or all of the following characteristics:	Well-defined activities means (engineering) activities or projects that have some or all of the following characteristics:
2	Range of resources	Involve the use of diverse resources (and for this purpose resources includes people, money, equipment, materials, information and technologies)	Involve a variety of resources (and for this purposes resources includes people, money, equipment, materials, information and technologies)	Involve a limited range of resources (and for this purpose resources includes people, money, equipment, materials, information and technologies)
3	Level of interactions	Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues	Require resolution of occasional interactions between technical, engineering and other issues, of which few are conflicting	Require resolution of interactions between limited technical and engineering issues with little or no impact of wider issues
4	Innovation	Involve creative use engineering principles and research-based knowledge in novel ways	Involve the use of new materials, techniques or processes in non-standard ways	Involve the use of existing materials techniques, or processes in modified or new ways
5	Consequences to society and the environment	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation	Have reasonably predictable consequences that are most important locally, but may extend more widely	Have consequences that are locally important and not far-reaching
6	Familiarity	Can extend beyond previous experiences by applying principles-based approaches	Require a knowledge of normal operating procedures and processes	Require a knowledge of practical procedures and practices for widely-applied operations and processes

To meet the minimum standard of competence a person must demonstrate that he/she is able to practice competently in his/her practice area to the standard expected of a reasonable Professional Engineer/Engineering Technologist/Engineering Technician. The extent to which the person is able to perform each of the following elements in his/her practice area must be taken into account in assessing whether or not he/she meets the overall standard.

		Differentiating Characteristic	Professional Engineer	Engineering Technologist	Engineering Technician
1.	**Comprehend and apply universal knowledge**	Breadth and depth of education and type of knowledge	Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice	Comprehend and apply the knowledge embodied in widely accepted and applied procedures, processes, systems or methodologies	Comprehend and apply knowledge embodied in standardised practices
2.	**Comprehend and apply local knowledge**	Type of local knowledge	Comprehend and apply advanced knowledge of the widely-applied principles underpinning good practice specific to the jurisdiction in which he/she practices.	Comprehend and apply the knowledge embodied procedures, processes, systems or methodologies that is specific to the jurisdiction in which he/she practices.	Comprehend and apply knowledge embodied in standardised practices specific to the jurisdiction in which he/she practices.
3.	**Problem analysis**	Complexity of analysis	Define, investigate and analyse complex problems	Identify, clarify, and analyse broadly-defined problems	Identify, state and analyse well-defined problems
4.	**Design and development of solutions**	Nature of the problem and uniqueness of the solution	Design or develop solutions to complex problems	Design or develop solutions to broadly-defined problems	Design or develop solutions to well-defined problems
5.	**Evaluation**	Type of activity	Evaluate the outcomes and impacts of complex activities	Evaluate the outcomes and impacts of broadly defined activities	Evaluate the outcomes and impacts of well-defined activities
6.	**Protection of society**	Types of activity and responsibility to public	Recognise the reasonably foreseeable social, cultural and environmental effects of complex activities generally, and have regard to the need for sustainability; recognise that the protection of society is the highest priority	Recognise the reasonably foreseeable social, cultural and environmental effects of broadly-defined activities generally, and have regard to the need for sustainability; take responsibility in all these activities to avoid putting the public at risk.	Recognise the reasonably foreseeable social, cultural and environmental effects of well-defined activities generally, and have regard to the need for sustainability; use engineering technical expertise to prevent dangers to the public.
7.	**Legal and regulatory**	No differentiation in this characteristic	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities	Meet all legal and regulatory requirements and protect public health and safety in the course of his or her activities
8.	**Ethics**	No differentiation in this characteristic	Conduct his or her activities ethically	Conduct his or her activities ethically	Conduct his or her activities ethically
9.	**Manage engineering activities**	Types of activity	Manage part or all of one or more complex activities	Manage part or all of one or more broadly-defined activities	Manage part or all of one or more well-defined activities
10.	**Communication**	No differentiation in this characteristic	Communicate clearly with others in the course of his or her	Communicate clearly with others in the course of his or	Communicate clearly with others in the course of his or her

			activities	her activities	activities
11.	**Lifelong learning**	Preparation for and depth of continuing learning.	Undertake CPD activities sufficient to maintain and extend his or her competence	Undertake CPD activities sufficient to maintain and extend his or her competence	Undertake CPD activities sufficient to maintain and extend his or her competence
12.	**Judgement**	Level of developed knowledge, and ability and judgement in relation to type of activity	Recognize complexity and assess alternatives in light of competing requirements and incomplete knowledge. Exercise sound judgement in the course of his or her complex activities	Choose appropriate technologies to deal with broadly defined problems. Exercise sound judgement in the course of his or her broadly-defined activities	Choose and apply appropriate technical expertise. Exercise sound judgement in the course of his or her well-defined activities
13.	**Responsibility for decisions**	Type of activity for which responsibility is taken	Be responsible for making decisions on part or all of complex activities	Be responsible for making decisions on part or all of one or more broadly defined activities	Be responsible for making decisions on part or all of all of one or more well-defined activities