

ALTERNATIVE ROUTES TO MEMBERSHIP

Experiential Learning Route to

CHARTERED ENGINEER

Engineers Ireland

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1. INTRODUCTION

Engineers Ireland, founded in 1835, represents all branches of the engineering profession and categories of engineer in Ireland.

The fundamental aims of Engineers Ireland are:

- to promote knowledge of engineering and of engineering science
- to establish and maintain standards of engineering education and training
- to promote and provide opportunities for continuing professional development for engineers
- to maintain standards of professional ethics and conduct
- to ensure that the Registered Professional Titles of Engineers Ireland are assigned only to appropriately qualified engineers and technicians.

Engineers Ireland is empowered to define and protect the use of the title Chartered Engineer under its Charter Amendment Act, 1969 which states:

Chartered members of Engineers Ireland shall be known as “Chartered Engineers” and shall have the right so to describe themselves and to use after their names the abbreviation “CEng”. Such right shall be confined to such Chartered Members and to persons within the State in respect of whom the Council is satisfied that they are authorised to describe themselves as Chartered Engineers by a professional body recognised by the Council in that behalf.

Within Ireland, Engineers Ireland is the authoritative voice of the engineering profession on relevant national issues. It makes submissions and representations to Government and official bodies on national policy for infrastructure, budgets, industry, education and the overall development of the Irish economy.

Engineers Ireland is a signatory to a wide range of international accords and bilateral agreements which enable holders of various grades of membership and Registered Professional Titles to practise in Australia, Canada, Hong Kong - China, New Zealand, South Africa, the United Kingdom, the United States and all member states of the European Union. The EMF Agreement signed in June 2001 enables Irish Chartered Engineers to practise in all of the above countries, together with Japan, Korea and Malaysia.

2. THE CHARTERED ENGINEER

2.1 DEFINITION OF A CHARTERED ENGINEER

The following is the definition of a professional engineer recognised by the Council of Engineers Ireland for the title Chartered Engineer and is the definition adopted in 1960 by the Conference of Engineering Societies of Western Europe and the United States of America (EUSEC):

A Chartered Engineer is competent by virtue of his/her fundamental education and training to apply the scientific method and outlook to the analysis and solution of engineering problems. He/she is able to assume personal responsibility for the development and application of engineering science and knowledge, notably in research, design, construction, manufacturing, superintending, managing and in the education of the engineer. His/her work is predominantly intellectual and varied and not of a routine mental or physical character. It requires the exercised of original thought and judgement and the ability to supervise the technical and administrative work of others.

His/her education will have been such as to make him/her capable of closely and continuously following progress in his/her branch of engineering science by consulting newly published works on a worldwide basis, assimilating such information and applying it independently. He/she is thus placed in a position to make contributions to the development of engineering science or its applications.

His/her education and training will have been such that he/she will have acquired a broad and general appreciation of the engineering sciences as well as a thorough insight into the special features of his/her own branch. In due time he/she will be able to give authoritative technical advice and to assume responsibility for the direction of important tasks in his/her branch.

2.2 FORMATION OF A CHARTERED ENGINEER

The formation of a Chartered Engineer takes a minimum of eight years and consists of two phases.

The first phase consists of studying and successfully completing an engineering degree programme accredited by Engineers Ireland as meeting the educational standard required for the title Chartered Engineer.

The second phase is called Initial Professional Development and involves the achievement of the competences necessary to apply engineering principles to the solutions of engineering problems. This phase is described in detail in Engineers Ireland's publication *Chartered Engineer – Regulations for the title of Chartered Engineer*.

During the engineer's initial years of employment he/she will develop the necessary competences associated with the application of what he/she learned in college, in the solution of engineering problems. Only when an engineer can demonstrate that he/she has acquired the competences specified in Engineers Ireland's publication *Chartered Engineer – Regulations for the title of Chartered Engineer*, may his/her engineering formation be regarded as meeting the standards prescribed by Engineers Ireland for the Chartered Engineer title.

2.3 THE COMPETENCES OF A CHARTERED ENGINEER

A graduate of an accredited honours engineering degree programme will be able to demonstrate the skills, knowledge and understanding associated with the Programme Outcomes in Part 1 of Engineers Ireland's publication "*Accreditation of Engineering Education Programmes*". The requirements that holders of such accredited engineering degrees must meet in order to succeed in the professional review leading to the title "Chartered Engineer", are described in Engineers Ireland's publication "Regulations for the title Chartered Engineer". The competences required are reproduced here in Appendix A.

3. ACQUIRING THE COMPETENCES BY EXPERIENTIAL LEARNING

- 3.1** Engineers Ireland recognises that the development of engineering competences can take place in a wide range of settings. These include educational institutions and the engineering workplace. Furthermore, individuals with a personal interest in and enthusiasm for engineering may study engineering and attend various training courses throughout their career. Such individuals may be functioning as professional engineers in the workplace.
- 3.2** Engineers Ireland considers that such engineers, provided they succeed in the examination process described here, should be included in the membership of Engineers Ireland and granted the title of Chartered Engineer. As these engineers do not hold accredited engineering degrees, an alternative approach is required when evaluating whether they meet the statutory requirements by which Engineers Ireland must abide when considering such applications.
- 3.3** It should be understood that not all candidates will have all the competences. It is a matter for the Examiners to determine if they are satisfied with a particular candidate's overall performance, to recommend that the candidate should be granted the title Chartered Engineer.
- 3.4** The Experiential Learning Procedure has been formulated for those who do not have formal academic qualifications at the required level but who, over an extensive number of years may have developed the competences of a Chartered Engineer. This they will have achieved in one or more of the following ways:
 - 3.4.1** Participating in various educational and training programmes related to engineering.
 - 3.4.2** Working with Chartered Engineers on engineering projects and involvement in project design and implementation.
 - 3.4.3** Executing engineering projects of increasing complexity over a period of years.
 - 3.4.4** Researching engineering literature and reports in order to find solutions to engineering problems.

3.4.5 Having been recognised as having professional engineering skills by an employer, being assigned to projects requiring engineering analysis leading to problem solving.

3.4.6 Functioning as a ‘*de facto*’ professional engineer, with other professional engineers on a range of projects exploring and covering the generality of a particular engineering discipline

4. LEARNING THROUGH EXPERIENCE THE COMPETENCES OF A CHARTERED ENGINEER

4.1 It is easier to quantify experience than it is to measure learning. Experience is an input and learning is an output. Unfortunately there is no guarantee that “X” amount of experience will yield “X” amount of learning. The variables are numerous, including both the qualities of the learner and the quality and duration of the experience.

If an individual is eager to learn, he/she can absorb knowledge, acquire skills and develop new perspectives and insights. On the other hand, an individual who is uninterested or has difficulty learning, may spend years employed in an engineering setting paying little attention to the learning potential of his/her working environment and learning little.

4.2 The common complaint about those who have learned only from experience is that they can “do” (in a particular setting), but cannot “explain”. This is because they may not fully understand the engineering principles that would allow them to apply their learning in new settings or to discuss the concepts embodying these principles in an analytical way.

In addition to an appropriate balance between theory and practice, the learner, through reflection, needs to know why both are necessary and how each extends the value of the other.

4.3 In order to succeed, the candidate must successfully demonstrate to Engineers Ireland that he/she:

- a) Has acquired the competences of a Chartered Engineer
- b) Has an appropriate depth and balance of knowledge between theory and practice so that the interplay between the two is strategically effective.
- c) Has the breadth of understanding of the Chartered Engineer’s competences such that he/she can apply these in a wide range of diverse settings.

5. APPLICATION REQUIREMENTS

5.1 Applicants following this Procedure require no formal academic qualifications.

5.2 Engineers Ireland considers that the acquisition by an applicant of the competences of a Chartered Engineer by experiential learning would require a 20-year period of working in appropriate engineering settings. In exceptional circumstances an applicant might achieve these competences in a

shorter period, especially if the applicant has successfully completed engineering education or training programmes.

6. APPLICATION PROCEDURE

- 6.1** The process is initiated by the applicant completing an “Alternative Routes to Assessment Form”, the primary purpose of which is to enable the Membership and Qualifications Board to determine the most appropriate grade of membership/title and/or the process to be followed by the applicant.
- 6.2** If the Board agrees that the applicant should apply for the title of Chartered Engineer through the Experiential Learning Procedure the candidate will be invited to produce a portfolio describing past learning and achievements to date.
- 6.3** The portfolio will consist of three sections:
- (a) Report on Experiential Learning (Section 8)
 - (b) Report on an Engineering Project (Section 9)
 - (c) Two Essays (Section 10)
- 6.4** The Board of Examiners, through the Registrar, will assign a mentor to each candidate. The role of the mentor is to provide candidates with an understanding of how to construct the portfolio.
- 6.5** The completed portfolio, when submitted to Engineers Ireland by the applicant, will be referred to Examiners (Section 11), appointed by the Board of Examiners. The task of the Examiners is to evaluate the candidate’s competences as presented in the portfolio and the extent to which these meet the competences listed in Appendix A.
- 6.6** The Examination will consist of:
- (a) A formal presentation of the portfolio by the candidate to the Examiners, at the beginning of the oral examination.
 - (b) An oral examination (Section 12), during which any aspect of the portfolio may require clarification or elucidation by the Examiners
- 6.7** The Examiners are required to satisfy themselves that the candidate has reached an acceptable level in the competences described in Appendix A. Due consideration will be given to the diversity of settings in which candidates may have developed their competences. The Examiners in the interpretation of the content of the portfolio will exercise flexibility. Examiners will not expect candidates to have all the competences listed. The set of competences listed represent the ideal profile of a Chartered Engineer. It is a matter for the Examiners to exercise careful judgement in reaching a recommendation.

7. THE ROLE OF THE MENTOR

- 7.1 The role of the mentor is confined to assisting the candidate in
- (a) understanding the meaning of the competences described in Appendix A and
 - (b) accurately identifying and describing his/her skills and knowledge insofar as these relate to the competences.
- 7.2 The mentor's role does not in any way extend to enhancing the quality of the candidate's skills and knowledge beyond assisting the candidate as described above.
- 7.3 The mentor has no role or influence in the examination of the candidate and cannot be held responsible in any way for the outcome of the examination.

8. REPORT ON EXPERIENTIAL LEARNING (SEE ALSO APPENDIX B)

- 8.1 This section of the portfolio is an extended engineering practice report which should give details of education, training and work experience in a clear, uniform format as described in Appendix B.
- 8.2 The appointed mentor will first discuss with and explain to the candidate, the competences listed in Appendix A.
- 8.3 Information should be provided in relation to the experiential learning gained by the candidate, relating this, in each case, to a competence. Particular care should be taken to use concise language (See Appendix C) so that only experiential learning is being described and not simply experience.
- 8.4 A competence may be a simple or compound statement and the response to it should be structured accordingly. Each response should start with a statement of experiential learning achieved, which should be supported by specific examples of how the candidate's learning meets the competence criteria.
- 8.5 In describing his/her learning, the candidate should demonstrate not only knowledge or skills but also understanding of the engineering principles upon which these are based. The Examiners must be satisfied that the candidate comprehends in an analytical and systematic way the reasons why a particular engineering operation is necessary and how it solves an engineering problem.
- 8.6 The candidate must demonstrate that he/she can apply his/her engineering competences in a wide range of settings and not just within the confines of a specialised sector of engineering.
- 8.7 Information on the extent and character of the **personal contribution** and level of responsibility exercised by the candidate and where possible, some quantified measure of impact e.g. budget, level of risk, loss implications, etc. should be included. This is intended to assist the Examiners in making an assessment of the candidate and reaching a judgement on the level of competence and personal responsibility exercised.

- 8.8 Specific information relating to **personal responsibility** within each employing organisation must be included as well as details of significant technical or managerial problem solving and innovative activity. The scope for freedom of action available to the candidate and conversely the nature of constraints imposed will be of interest.
- 8.9 The candidate must provide a Letter of Certification from each employer which verifies the accuracy of learning being claimed. Other evidence such as reports, publications, photographs and software may also be provided.
- 8.10 The completed Report should be bound into the portfolio.

9. REPORT ON AN ENGINEERING PROJECT (SEE ALSO APPENDIX B)

- 9.1 The candidate is required to produce a written report (5000 to 7000 words) on an engineering project he/she has successfully undertaken during the 5 years immediately prior to the submission of this application to Engineers Ireland.
- 9.2 The nature of the project described in the report should be such as to support the candidate's claim in respect of competences achieved by experiential learning and described in the Experiential Learning Report.
- 9.3 The completed Report should be bound into the portfolio.

10. ESSAYS (SEE APPENDIX B)

- 10.1 Candidates must also submit two 500 word essays selected from the list of topics in Appendix A.
- 10.2 The essays should be bound into the portfolio.

11. THE EXAMINERS

- 11.1 The Board of Examiners will appoint three Examiners who are Chartered Engineers and members of Engineers Ireland. These will be selected as follows:
- Two Chartered Engineers with experience in an area of engineering cognate to that of the candidate's.
 - A current or former academic member of staff of a university or institute of technology offering one or more IEI accredited honours engineering degree programmes.
- 11.2 All three Examiners are required to be competent within the candidate's field of specialisation and to have an understanding of the assessment of learning.
- 11.3 The Board of Examiners, through the Registrar, shall appoint the Chairman.
- 11.4 The duties of the Examiners are to evaluate the portfolio and other relevant aspects of the application of the candidate as specified in this document and

to make a recommendation in respect of the candidate to the Membership and Qualifications Board.

11.5 The recommendation of the Examiners in respect of each candidate is submitted to the Membership and Qualifications Board of Engineers Ireland, whose decision in respect of each application, is final.

11.6 All members of the Membership and Qualifications Board and Examiners are bound by the Council of Engineers Ireland to maintain complete confidentiality with regard to proprietary or commercially sensitive information relating to a candidate's work or the activities of his/her employing organisation.

12. THE ORAL EXAMINATION

12.1 The Examiners will conduct an oral examination with the candidate, based on the content of the portfolio.

12.2 The fundamental purpose of the Examination is to evaluate the candidate's understanding of what has been presented in the portfolio and his/her overall engineering competences.

12.3 The Examination will normally extend over a period of at least 3 hours and will commence with the candidate being invited to give a verbal summary (maximum 20 minutes) of the portfolio content. This must highlight the experiential learning being claimed by the candidate.

12.4 The Examiners may discuss with and question the candidate about any aspect of the portfolio or oral presentation. This can include the relevant underlying scientific and engineering principles, knowledge of design codes and practice, technical aspects, environmental, safety, management and other issues considered relevant to the candidate's engineering specialisation.

12.5 The Examination will be conducted in a formal way and an extensive range of topics will be covered relating to the learning claimed and other appropriate areas.

12.6 At the end of the Examination the candidate will be given an opportunity to make a brief reference to any aspect of his/her portfolio that he/she feels is important and that has not been adequately explored during the interview.

12.7 The Examiners will submit their recommendation in respect of the Examination to the Membership and Qualification Board.

13. SUPPORTERS

13.1 Each candidate is required to have his/her application supported by two Chartered Engineers familiar with his/her work as a professional engineer.

13.2 Each supporter should be familiar with the regulations for the Experiential Learning Procedure (this document). He/she should also be prepared to support the application by completing the appropriate documentation confirming that the applicant is, in the supporter's considered view, a candidate who merits consideration for the award of the title Chartered Engineer.

14. APPLICATION FEE

Engineers Ireland will charge a fee, designed to recover its costs and expenses.

15. DURATION OF PROCEDURE

15.1 The candidate will be expected to complete and submit the portfolio within one calendar year of receiving confirmation from Engineers Ireland that he/she may proceed with its preparation.

15.2 Examiners will normally require about one month to evaluate the portfolio and prepare for the Examination of the candidate.

15.3 The candidate will be given at least two weeks' notice of the date of the Examination at which he/she will be required to present the portfolio, answer questions about it and discuss its content.

15.4 Engineers Ireland will communicate its decision to the candidate following the meeting of the Membership and Qualifications Board when the recommendation of the Examiners has been considered.

APPENDIX A

THE COMPETENCES OF A CHARTERED ENGINEER

Five Competences of a Chartered Engineer are listed and analysed in terms of the range of abilities normally associated with each one.

Competence 1

Use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology.

This normally includes an ability to:

- (a) maintain a sound theoretical approach in enabling the introduction of new and advancing technology and other relevant developments.

The Chartered Engineer:

- (i) continually strives to extend capabilities by accessing and exploiting all relevant personal and professional development sources;
 - (ii) exercises information retrieval skills to keep abreast of current and future technological or other relevant developments;
 - (iii) broadens knowledge base through the Internet, the media, professional journals, attendance at professional seminars and networking;
 - (iv) deepens knowledge base systematically through research and experimentation.
- (b) apply a creative problem solving approach.

The Chartered Engineer:

- (i) identifies and agrees customer, user and community requirements;
 - (ii) exercises creativity and initiative in investigating, analysing and conceptualising possible solutions to achieve objectives;
 - (iii) analyses promising concepts for final solution to assess impacts of factors such as performance, reliability and maintainability and customer satisfaction.
- (c) look for ways of exploiting emerging technologies to enhance current practices and to ensure continuing fitness for purpose of engineered products and services.

The Chartered Engineer:

- (i) extends knowledge of related disciplines or fields and fosters co-operation across discipline boundaries to identify future potential opportunities;
 - (ii) assesses potential impact of emerging technologies;
 - (iii) identifies opportunities to apply emerging technologies to existing products and processes.
- (d) promote innovation and technology transfer.

The Chartered Engineer:

- (i) assesses user acceptance and future requirements;
- (ii) investigates needs and exploits opportunities for the transfer of technology within a particular industry or area of expertise, taking appropriate actions to secure the value of intellectual property;
- (iii) promotes new applications internally and externally when appropriate;
- (iv) assesses marketing needs and contributes to marketing strategies.

Competence 2

Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems.

This normally includes an ability to:

- (a) identify potential projects and opportunities.

The Chartered Engineer:

- (i) reviews external developments to assess applicability to areas of responsibility;
- (ii) continually reviews potential for enhancement of products and services;
- (iii) identifies the complexities of the potential projects and problems;
- (iv) exercises original thought in synthesising satisfactory outcomes to engineering challenges;

- (v) utilises knowledge of employer's commercial position to assess viability of projects.
- (b) conduct appropriate research, and undertake design and development of possible solutions.

The Chartered Engineer:

- (i) demonstrates potential solutions by physical or computer models using mathematical analysis, computer simulations or other modelling techniques;
- (ii) analyses promising concepts for final design to assess impacts of factors such as performance, reliability and maintainability.
- (iii) undertakes cost-benefit and risk analyses, feasibility studies and life-cycle costing to produce a workable design;
- (iv) uses appropriate engineering and technological aids;
- (c) plan and implement solutions, taking a holistic approach to cost, benefits, safety, reliability, appearance and environmental impact.

The Chartered Engineer:

- (i) prepares and recommends for implementation a documented proposal to meet client or manufacturing requirements;
- (ii) prepares test schedules for performance and physical environmental testing, oversees testing, analyses test results and recommends or arranges tests;
- (iii) identifies possible problem areas and negotiates modifications or adaptations as necessary;
- (iv) takes corrective action to overcome any shortcomings revealed.
- (d) evaluate the solutions and make improvements.

The Chartered Engineer:

- (i) determines impact on design of factors such as production, construction, installation, commissioning, life cycle implications, logistic support and training of users;
- (ii) participates in consultation with affected parties on product or process evaluation;
- (iii) evaluates the solution against the specification;
- (iv) identifies potential improvements and ensures that they meet the specification, are practicable and are implemented.

Competence 3

Provide technical, commercial and managerial leadership.

This normally includes an ability to:

- (a) plan for effective project implementation.

The Chartered Engineer:

- (i) prepares and agrees the development of a project proposal;
 - (ii) negotiates adequate resource provision;
 - (iii) determines methods of approach and analyses work to be performed to provide the basis for resource estimates, applying appropriate project management techniques;
 - (iv) makes appropriate contractual arrangements with customers, suppliers and partners to secure employer's commercial position;
 - (v) recognises the competence of others, including non-engineering specialists, and uses them to secure project delivery.
- (b) plan, budget, organise, direct and control tasks, people or resources.

The Chartered Engineer:

- (i) sets and implements work objectives and priorities, including time, resource and cost estimates.
 - (ii) organises work teams, exercising leadership over other engineers, technical or other personnel where required;
 - (iii) monitors tasks to ensure activities are performed as planned, and takes corrective action as required;
 - (iv) recognises, interprets and applies appropriate regulations.
- (c) develop the capabilities of staff to meet the demands of changing technical and managerial requirements.

The Chartered Engineer:

- (i) contributes to identifying and determining training needs;
- (ii) develops training plans for subordinates;

- (iii) implements experiential development programmes for subordinates, including workforce retraining, adaptation to new technology and skills extension tasks;
 - (iv) participates in reviews of effectiveness of work-place training programmes.
- (d) bring about continuous improvement through quality management.

The Chartered Engineer:

- (i) contributes to implementation of quality system;
- (ii) fosters the acceptance by subordinates and colleagues of quality management principles;
- (iii) performs work to appropriate quality standards;
- (iv) applies quality control and assurance techniques.

Competence 4

Use effective communication and interpersonal skills.

This normally includes an ability to:

- (a) work and communicate with others at all levels.

The Chartered Engineer:

- (i) develops good personal relationships appropriate to the level of communication;
- (ii) communicates effectively in the English language and in other languages if circumstances dictate;
- (iii) takes part in discussions ensuring two way effective communication;
- (iv) responds effectively and efficiently to all received communication.

- (b) effectively present and discuss ideas and plans.

The Chartered Engineer:

- (i) clarifies objectives, identifies main purpose, and selects appropriate medium for communication;
- (ii) prepares and presents lectures and reports, and publishes papers at a professional level;
- (iii) selects appropriate methods of communication using words, images, audio and video, as appropriate;

- (iv) communicates fluently in written and oral expression at an experienced professional standard;
- (c) build teams and negotiate.

The Chartered Engineer:

- (i) identifies collective goals and responsibilities;
- (ii) works towards collective goals;
- (iii) creates, maintains and enhances effective working relationships;
- (iv) issues clear and accurate instructions to subordinates as appropriate;
- (v) develops teams, individuals and self to enhance performance;
- (vi) undertakes negotiation, conflict resolution, counselling, exchanging ideas and conveying convictions and attitudes.

Competence 5

Make a personal commitment to abide by the appropriate code of professional conduct, recognising obligations to society, the profession and the environment.

In order to satisfy this commitment, they must:

- (a) comply with the Codes and Rules of Conduct.

Chartered Engineers:

- (i) place responsibility for the welfare, health and safety of the community at all times before responsibility to the profession, to sectional interests, or to other engineers;
 - (ii) comply with Engineers Ireland's Codes of Ethics;
 - (iii) apply professional skill in the interests of employer or client, for whom they act, in professional matters, as a faithful agent or trustee;
 - (iv) give evidence, express opinions or make statements in an objective and truthful manner and on the basis of adequate knowledge.
- (b) Manage and apply safe systems of work.

The Chartered Engineer:

- (i) takes account of potential professional risks and liabilities, and accepts responsibility for them;
 - (ii) implements appropriate occupational health and safety requirements;
 - (iii) investigates community safety requirements and acts to solve any incipient safety problems;
 - (iv) takes appropriate precautions when dealing with hazardous operations;
 - (v) takes account of disaster prevention, mitigation and recovery methods.
- (c) undertake their engineering work in compliance with the Codes of Practice on Risk and the Environment.

The Chartered Engineer:

- (i) promotes the actions required in engineering practice to improve, sustain and restore the environment;
 - (ii) promotes the wise use of non-renewable resources through waste minimisation, recycling and the development of alternatives wherever possible;
 - (iii) strives to achieve the beneficial objectives of engineering work with the lowest possible consumption of raw materials and energy, and by adopting sustainable management practices;
 - (iv) takes account of total life-cycle implications of products and projects in relation to the environment.
- (d) carry out the continuing professional development necessary to ensure competence in their areas of future intended practice.

The Chartered Engineer:

- (i) undertakes professional development to enhance technical and management competence;
- (ii) sets goals to achieve personal and organisational objectives;
- (iii) prepares and maintains a career action plan;

maintains records of professional development activities.

APPENDIX B

FORMAT OF PORTFOLIO FOR EXPERIENTIAL LEARNING PROCEDURE

1. The portfolio consists of three parts:
 - (a) Report on Experiential Learning
 - (b) Report on an Engineering Project
 - (c) The Essays

2. The purpose of the portfolio is to provide the Examiners with a description of the learning gained by the candidate from experience of working in an engineering environment, so as to enable the Examiners to evaluate the extent to which the candidate has achieved the competences of a Chartered Engineer. It is also an important opportunity for candidates to demonstrate their ability to communicate clearly in writing.

3. **Report on Experiential Learning**
 - (a) The Report on Experiential Learning must be prefaced by a tabular **Summary of Career Details**, in chronological order, sequentially numbered and including the following in relation to each position held:
 - name of employing company/organisation
 - title(s) of position(s) held/degree of responsibility
 - reporting relationship(s) stating in detail position, qualifications and professional membership of superior(s)
 - duration of each phase of training and experience

 - (b) The Report on Experiential Learning must also include, separately and in chronological order, an outline of the training undertaken by the candidate as set out in the Summary of Career Details. It should identify clearly and separately:
 - formal education and training programmes
 - job-related courses
 - Continuing Professional Development (CPD) activities

In relation to each education programme, training programme, job-related course, CPD activity and each item of engineering experience, the Experiential Learning Report must list the engineering competences learned by the candidate using the learning descriptors in Appendix C, covering the issues described in Section 8 of this document and relating the learning gained to the competences of a Chartered Engineer described in Appendix A.

 - (c) The Report should be not less than 12,000 and not more than 15,000 words in length. The candidate should indicate the actual number of words.

4. Report on an Engineering Project

The Report on an Engineering Project should be 5000-7000 words in length. The actual number of words should be indicated by the candidate.

5. The Essays

The Essays should each be of 500 words. The actual number of words should be indicated by the candidate. Separate essay topics related to any two of the following areas should be selected:

- Professional Conduct
- The Environment
- Health & Safety
- Project Management
- Dispute Resolution in the Engineering Industry
- Engineering Education
- Continuing Professional Development
- Information Technology

6. General

- (a) All three sections of the portfolio must be typed or printed and bound into one volume. The minimum font size must be 12 point.
- (b) Presentation is an important feature of the portfolio. The form and layout of the portfolio must facilitate examination. The candidate should avoid excessive use of jargon, acronyms, shorthand terms, etc. A glossary of terms is essential. The first use of a term or title in the portfolio which is subsequently abbreviated must be given in full with its acronym. Spelling, grammar and syntax are clearly important. Pages must be numbered. Candidates should provide reasonable spacing between sections. Small drawings, diagrams and/or photographs may be included in an Appendix. Errors and omissions should be avoided by careful editing.
- (c) The portfolio must be forwarded in quadruplicate to Engineers Ireland and accompanied by the application fee.
- (d) The portfolio must end with the following Statement of Authenticity and be signed and dated by the candidate:

I hereby certify that the Reports and Essays in this portfolio have been prepared in their entirety by me and that all statements and claims made therein are true and accurate.

APPENDIX C

COMPETENCE DESCRIPTORS

The following table gives examples of some skills and the verbs which may be used to describe specific competences.

Skills	Active verbs (examples)
Recall	Define, List, Identify, Name, State, Recognise
Understanding	Explain, Interpret, Predict, Distinguish, Summarise, Justify
Application	Analyse, Solve, Calculate, Evaluate, Plan, Devise, Select, Organise
Manual Skills	Assemble, Measure, Manipulate, Construct, Use
Behavioural Skills	Demonstrate, Communicate, Provide Support, Advise

In drawing up specific competences it is important to avoid ambiguous language.

Avoid Words Like:

Know
Understand
Be familiar with
Become acquainted with
Have a good grasp of
Obtain a working knowledge of
Appreciate
Realise the significance of
Be aware of
Believe
Be interested in

Use Words Like:

List
Describe
Evaluate
State
Explain
Select
Identify
Distinguish
Design
Construct
Solve

Although the above list is arranged in pairs of contrasting words or phrases there is no suggestion that the word in the second column is meant to replace the word or phrase in the same row of the first column.