

CEng FURTHER LEARNING GUIDANCE

These guidance notes are intended to complement the Further Learning Individual Assessment Form by providing information that you should consider before completing your form.

1. PERSONAL DETAILS:

Please list your current details. If you are a recent graduate or not a member of the IMechE, you can apply for Associate Membership by contacting the membership helpdesk on 0845 226 9191

2. ACADEMIC QUALIFICATIONS:

Please identify if your degree is accredited by completing the Qualification Checker.

If your qualification is not accredited, or you have no formal qualifications, the Academic Assessment Committee (AAC) can assess your academic achievements for either CEng or IEng registration. The AAC can either accept your qualifications as they are or recommend further steps to enable you to meet the criteria.

This assessment must be completed before completing a Further Learning application, as the outcome will determine whether further learning is necessary.

On receipt of the completed application form your proposal will be assessed against the appropriate benchmark:

- **Incorporated Engineer** – the benchmark is Bachelors level knowledge
- **Chartered Engineer** – the benchmark is Masters level knowledge

3, 4, 5, 6&7. ADVISOR/MENTOR DETAILS:

If claiming any work based learning: the Advisor/Mentor will authenticate and sign off your completed Further Learning Evidence once your plan has been fully completed and approved.

This Mentor or Advisor will typically be a registered engineer at the relevant level you are working towards, i.e. IEng or CEng, and be someone you work with or know well.

Additional Features: This section is useful to give an overview of your work and experiences and may assist the committee to get a better understanding of any work based knowledge you are claiming.

5. ENGINEERING & SCIENCE DEEPENING:

The objective in this part of the plan is to gain an in-depth understanding of an area(s) of engineering that is similar in terms of depth to that of someone with a Masters degree. The following definitions outline what is expected of someone with this level of knowledge:

- A systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of your academic discipline, field of study or area of professional practice;
- Conceptual understanding that enables you to evaluate critically current research and advanced scholarship in your chosen area or discipline;

A Chartered Engineer is expected to have a comprehensive understanding of new and existing technology, practices, and standards in their field of engineering and an ability to successfully deal with circumstances which fall outside of the range of current knowledge or practice.

The normal approach is to study two technical modules at Masters level from a University MSc course. An alternative is to undertake a work based learning project, although whether this is a suitable option will depend on the nature of the work that is being undertaken.

If selecting Masters level modules the following should be confirmed:

- The modules are at Masters level (not all modules in an MSc course will necessarily be at this level)
- The modules are pure engineering or science based. (Modules involving management – e.g. project management, management of technology, etc. - are not acceptable. Modules in manufacturing may cover both technical and management aspects but should be checked to confirm that they have a technical focus.)
- How many CATS points the modules are worth (the Plan needs to provide a minimum of 30 CATS points, i.e. two modules of 15 points each or 3 of 10 points each)

If claiming MSc modules – please attach full module descriptors, ensuring the academic learning outcomes are detailed within them. In this case the learning outcomes do not have to be repeated on the form.

Some week long CPD type courses may be at the required level. The depth of the proposed course should be checked before putting forward such a course and the proposal should make it clear whether there is private study associated with the course and what assessment of the knowledge learnt is included as part of the course. Where no formal assessment is included, individual assessment will be required and this should be carefully considered. The normal approach would be to prepare a report outlining what has been learnt, preferably relating it to work activities. This report should be reviewed by an appropriately experienced engineer, followed by a viva to test the knowledge gained.

Work based learning project(s) may be appropriate for some individuals where the nature of their work allows them to work on the design, development, or investigation of technology. Such projects should include study and research to supplement execution of the work task so that a detailed knowledge of the underlying engineering principles and theory relevant to the task is gained.

The academic learning outcomes that will come from the project should be set out in the plan. If in doubt about how to frame these, it may be worth looking at the outcomes expected from an MSc module covering a similar technology area. This will also give an idea of the depth of learning that would be expected from such a work based project.

Simply completing a project is unlikely to meet the requirements. The plan will need to explain the project and the way in which it will be used to provide the required technical deepening as well as the arrangements that will be made to assess the knowledge gained. The normal format will be to complete a report (which focuses on the knowledge aspect and in particular on the predefined learning outcomes rather than on the task itself) and have this assessed by an appropriately experienced engineer, followed by a viva to test the knowledge gained.

Summary: For each statement you need to summarise how you will fulfil this. You should give a summary of the knowledge clearly showing: how and what will be covered, indicating a time frame, level of knowledge, and where this will take place:

For each statement you may want to consider approx x1 15-20 credit modules or comparative learning time of approx 150-200 hours

- Associated Learning Outcomes: After the summary, you should list what knowledge gain will be undertaken. This will be in the form of statements which explicitly explain, in detail, what you will be learning

If claiming MSc modules – please attach full module descriptors ensuring the academic learning outcomes are detailed within them.

e.g. 1.

Summary:

Complete a distance learning 20 credit Masters module from the MSc in 'Advanced Materials' from the university of xyz. The module will be taught over 4 weeks and requires 150 student effort hours. The module will focus on areas such as: thermal, optical and magnetic material properties; evaluation of structure and properties of polymers; Composites such as matrices, strength and stress transfer, anisotropy, laminates, structural foams and processing advances, and comparative analysis of unconventional manufacturing processes and developments.

- Associated Learning Outcomes:
- Learn how to derive performance indices for selecting materials and manufacturing processes
- Understand how to critically evaluate the relationship between material attributes and modes of structural failure
- Have an understanding of properties of materials in terms of their constituents and structure at both macro and microscopic level
- Learn how to modify component design to ease orientation and assembly

Assessor Details:

Name: University of xyz, 1 week coursework and final 2 hour exam

Job Position: university set examination papers

Expertise in area: university set examination

6&7. TECHNICAL & NON-TECHNICAL BROADENING:

The objective in these two sections of the plan is to broaden technical and non-technical knowledge to support development as a professional engineer. The overall aim is to acquire knowledge which provides:

- comprehensive understanding of techniques applicable to your own research or advanced scholarship;
- originality in application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in your chosen discipline;
- conceptual understanding that enables you to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses;

This part of the plan will typically be accomplished by a combination of University modules (at a minimum of Bachelors level), training courses, and work based projects. Most plans are likely to focus on the latter two elements.

It is important to recognise that the objective of the Plan is to build knowledge, not to demonstrate competence. Thus it is not sufficient to show that a task has been completed, but to demonstrate that knowledge, whether it is the underlying engineering principles or theory, has been acquired. A detailed understanding of techniques/methods or the alternative approaches and the factors to use in determining which to select will demonstrate sufficient knowledge has been gained. This is why MPDS reports or similar development reports are not sufficient to demonstrate Further Learning.

If University modules are selected, then these should be at a minimum of Bachelors (Hons) level. They should also be chosen to extend knowledge beyond that studied in the first degree. I.e. they should not cover the same subject matter as has already been studied. The normal approach is to develop a Plan combining formal training (i.e. short courses), with work based projects and some private study, in areas directly relevant to your role. The total of these elements should equate to between 300 & 600 hours equivalent learning time (with work based projects, assess only the time spent "learning", not the whole project time.) Please note that the minimum total amount for Technical and Non-Technical Broadening should equate to 900 hours of equivalent learning time.

If claiming University modules – please attach full module descriptors ensuring the academic learning outcomes are detailed within them. In this case the learning outcomes do not have to be repeated on the form. Please note that when claiming academic modules the amount of work measured in terms of CATS/ECTS points can be equated to hours of equivalent study. Typically 10 CATS points = 5 ECTS points = 100 hours of equivalent academic study.

Most engineers will attend training courses as part of their development and these can also contribute to the broadening of both Technical and Non-Technical knowledge. The

learning outcomes from the proposed courses should be set out in the Plan. Most such courses do not include any formal assessment of the knowledge gained and it is important that this aspect is considered. The normal approach is to prepare a report following attendance, setting out the knowledge gained to meet the learning outcomes and its relevance to current and future work. This report should be reviewed by an appropriately experienced engineer (or expert in the case of non-technical broadening), followed by a short viva to test the knowledge gained. The IMechE provides an assessment form to be used at these vivas/report assessments.

Work based projects provide the opportunity to develop and extend knowledge related to the actual task. The learning outcomes to be achieved should be considered and set out in the plan. The achievement of these must be assessed by an appropriately experienced engineer or expert, by your producing a short report which focuses on the learning achieved, followed by a short viva to test the knowledge gained. The IMechE provides an assessment form to be used at these vivas/report assessments.

As already noted, the plan should provide the equivalent of a minimum of 900 hours learning for both the technical and non-technical aspects. Assessment of equivalent value for each element should take into account the time taken to consider the learning that can be achieved (defining the learning outcomes) and in reviewing the learning following the course or project, including writing the report. For work based projects it is only the proportion of the project time where learning is taking place and not the whole project time that should be considered, together with the private study time used to extend the learning and set it in context.

e.g. 1.

Summary:

Suggested topic areas to demonstrate a broadened knowledge and understanding:

- Engineering principles and ability to apply them to analyse key engineering processes
- Knowledge to apply quantitative methods and computer software relevant to your work in order to solve engineering problems
- Wide knowledge of design processes and methodologies and how to apply them and adapt to unfamiliar situations
- Knowledge to enable you to generate innovative designs for products, components to fulfil new needs
- Understanding of how to define and identify design constraints including environmental and sustainability limitations
- Extensive knowledge of management techniques and business practices to achieve engineering objectives
- Understanding of legal and ethical framework governing engineering activities at work

Assessor Details:

Name: Mr A Jones CEng FIMechE

Job Position: Senior Engineer of Company xyz, for the last 7 years.

Expertise in area: Published papers on subject/has been working as senior engineer in xyz topics, leading projects in area for 8 years etc.

Overall:

Typically, once FL has been completed to Masters level for CEng, you will then be able to:

- deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate your conclusions clearly to specialist and non-specialist audiences
- demonstrate self-direction and originality in tackling and solving engineering problems, and act autonomously in planning and implementing tasks at a professional or equivalent level;
- continue to advance your knowledge and understanding, and to develop new skills to a high level.

and will have the qualities and transferable skills necessary for employment requiring

- the exercise of initiative and personal responsibility;
- decision-making in complex and unpredictable situations; and
- the independent learning ability required for continuing professional development.

5, 6&7. ASSESSMENT STYLE AND METHOD: (ASSESSOR DETAILS)

All work based learning must have written evidence of assessment against a set of defined assessment criteria. The 'criteria' are usually dictated by the Learning Outcomes identified in the plan. Hence these must be detailed and explicit on what learning should be undertaken. All assessment must be rigorous and robust

The associated Learning Outcomes will form the basis of a viva voce assessment for work where there is no formal examination process – the IMechE work based learning assessment form should be used to record this.

The form of assessment may vary as appropriate, but most often it will be done through: coursework, dissertation, formal examination and/or formal presentation; all followed by a viva voce (10-15 minute Q&A session), with your allocated assessor.

MPDS reports and Course Attendance Certificates will not be a form of recording Further Learning.

SUPPORTING INFORMATION:

You must keep an accurate record of your achievements whilst undertaking your Further Learning.

When you have completed your Further Learning, you will need to submit authenticated evidence of assessment to the IMechE for review (i.e. authenticated certificates or work based learning assessment forms showing assessment/exam results.)

A professional person such as a Chartered Engineer, a Personnel Manager, or Chief Executive (the person nominated in section 3 of this plan), should authenticate and sign off the final completed record.

Notes - Please read the Further Learning Guidelines that accompany this application form. The work based learning assessment form is electronic and the text boxes are expandable so that assessors should not be inhibited by the displayed size of the text box. We should emphasise that the entries should be clear and as extensive as necessary to convey the meaning unambiguously to a reader without knowledge of the context of the "study".

8. ENGAGEMENT:

The signature and date show your commitment to your plan and to confirm all the information is true to the best of your knowledge. Any revisions to your plan must be submitted as an entirely new application for review.

9. RECORD OF ACHIEVEMENT:

Accredited Company Schemes and University courses are listed at the following link:

www.imeche.org/furtherlearning

If you are completing your Further Learning through one of these companies or courses then you **do not** need to complete this form. Instead, inform us which route you are undertaking and the year that you start and intend to finish.

Assessment of Individual Further Learning Applications

An IMechE Committee that comprises experienced and knowledgeable Chartered Engineers representing industry and academia will assess your proposed Further Learning. It is important that you clearly define the content of your proposed Further Learning and supply any additional supporting information. There is currently no fee for submitting a Further Learning Plan.

X1 complete copy of the form **(including relevant supporting information)** should be sent to: Further Learning (Accreditation Department), Institution of Mechanical Engineers, Birdcage Walk, London, SW1H 9JJ

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