

Guidance Notes to Engineering Experience Framework

The hallmark of a professional engineer is the ability to apply the learning outcomes gained during study to real world situations. These are assessed as working experiences or learned competences. The EQF (European Quality Framework) defines competence as "a demonstrated ability to apply knowledge, skills and attitudes for achieving observable results".

Consequently, the related descriptions will embed and integrate knowledge, skills and attitudes.

- **Knowledge** represents the "set of know-what" (e.g. programming languages, design tools...) and can be described by operational descriptions.
- The item **skill** is defined as "ability to carry out managerial or engineering tasks". Managerial and technical skills are the components of competences and specify some core abilities which form a competence.
- **Attitude** means in this context the "cognitive and relational capacity" (e.g. analysis capacity, synthesis capacity, flexibility, pragmatism...). If skills are the components, attitudes are the glue, which keeps them together.

The purpose of this form is for the engineer to provide brief details of how you can demonstrate that you have acquired this working experience or competences in a number of areas. Please remember that you can refer to knowledge, skill and attitude under each experience criteria.

You may not be able to demonstrate work experience in every area therefore you must demonstrate sufficient experience in the majority of the competences in each of the experience criteria.

The response to each section should not exceed 250 words per experience criteria and should DEMONSTRATE how you have APPLIED your knowledge your experience after graduation.

Experience Criteria 1: Knowledge and Understanding

Demonstrate the application of knowledge and understanding of science, mathematics and engineering fundamentals underpin the competence of professional engineers. Applicants should be competent to apply their knowledge and understanding of their engineering specialisation, and also of the wider context of engineering, in the course of their professional experience.

Applicants should demonstrate how they have applied:	use ✓ when applicable:
a) An in-depth knowledge and understanding of the principles of their branch of engineering	✓
b) A critical awareness of the forefront of their branch	✓
c) Not applicable	

Describe/indicate the competence you are demonstrating (e.g. (a), (b) etc):
Ten years of experience in the area of railway systems, railway operations, electrical engineering, five years, University of applied Sciences St. Pölten,

Experience Criteria 2: Engineering Analysis

Applicants should be competent to solve engineering problems consistent with their level of knowledge and understanding, and which may involve considerations from outside their field of specialisation.

Applicants should demonstrate how, in the course of their professional experience, they have:	use ✓ when applicable:
a) Identified, formulated and solved engineering problems using established methods	✓
b) Analysed engineering products, processes and methods	✓
c) Applied relevant analytic and modeling methods	✓
d) Solved problems that are unfamiliar, incompletely defined, and have competing specifications; Applied new or innovative methods in problem solving	✓
e) Solved problems in new and emerging areas of their specialisation; applied their knowledge and understanding to conceptualise engineering models, systems and processes	
f) Not applicable	

Describe/indicate the competence you are demonstrating (e.g. (a), (b) etc):

In the duration of my train driver/instructor time, I had to execute a lot of methods to solve problems in the areas of electricity, technique, and had to teach new trainees, teach them my knowledge of years of experience, proven experience in engineering and train operations. In labours of the university we tested to solve different problems. In interdisciplinary projects and four academic thesis, we investigated different situations.

Experience Criteria 3: Investigations

Applicants should be competent to use appropriate methods to pursue research or other detailed investigations of technical issues consistent with their level of knowledge and understanding. Investigations may involve literature searches, the design and execution of experiments, the interpretation of data, and computer simulation. They should demonstrate that data bases, codes of practice and safety regulations are consulted.

Applicants should demonstrate how, in the course of their professional experience, they have:	use ✓ when applicable:
a) Identified, located and obtained required data	
b) Critically evaluated data and drawing conclusions	✓
c) Designed and conducted analytic, modeling and experimental investigations	
d) Investigated the application of new and emerging technologies in their branch of engineering	✓
e) Not applicable	

Describe/indicate the competence you are demonstrating (e.g. (a), (b) etc):

We had a very receptive altitude during the academic further education at the Univerity of applied Sciences, the bachelor program, and the master program , too.

Experience Criteria 4: Engineering Design

Applicants should be competent to realise engineering designs consistent with their level of knowledge and understanding, working in cooperation with engineers and non-engineers. The designs may be of devices, processes, methods or artefacts, and the specifications could be wider than technical, including an awareness of societal, health and safety, environmental and commercial considerations.

Applicants should demonstrate how, in the course of their professional experience, they have:	use ✓ when applicable:
a) Developed and realised designs to meet defined and specified requirements	✓
b) Applied design methodologies; designed solutions to unfamiliar (newly encountered) problems, possibly involving other disciplines	
c) Developed new and original ideas and methods	✓
d) Used their engineering judgment to work with complexity, technical uncertainty and incomplete information	✓
e) Not applicable	

Describe/indicate the competence you are demonstrating (e.g. (a), (b) etc):

In the area of railway systems and operations I solved different problems in relation to unfamiliar problems. I had to offer project tasks and books.

Experience Criteria 5: Engineering Practice

Applicants should be competent to apply their knowledge and understanding to solve problems, conduct investigations, and design engineering devices and processes. They should also recognise the wider, non-technical implications of engineering practice, ethical, environmental, commercial and industrial.

Applicants should demonstrate how, in the course of their professional experience, they have:	use ✓ when applicable:
a) Selected and used appropriate equipment, tools and methods	✓
b) Combined theory and practice to solve engineering problems	✓
c) Applied appropriate techniques and methods, and recognized their limitations	
d) Taken account of the non-technical implications of engineering practice	
e) Integrated knowledge from different branches of engineering, and handled complexity	✓
f) Not applicable	

Describe/indicate the competence you are demonstrating (e.g. (a), (b) etc):

Ten years, and especially the last five years I had the chance to combine practical experiences as a train driver and instructor at work, with the education at the University. I had the possibility to apply knowledge of the university at my job with different real problems on trains, on the tracks, or operational problems. Very deep and detailed.

Experience Criteria 6: Transferable Skills

Applicants should have the skills necessary to competently practice as an engineering professional, and more widely.

Applicants should demonstrate how, in the course of their professional experience, they have:	use ✓ when applicable:
a) Functioned effectively as an individual and as a member of a team	✓
b) Used diverse methods to communicate effectively with the engineering community at different disciplines and levels as well as with society at large	✓
c) Taken account of the health, safety and legal issues and responsibilities of engineering practice, the impact of engineering solutions in a societal and environmental context, and commit to professional ethics, responsibilities and norms of engineering practice	✓
d) Applied project management and business practices, such as risk and change management, and understood their limitations	✓
e) Engaged in independent, life-long learning	✓
f) Not applicable	

Describe/indicate the competence you are demonstrating (e.g. (a), (b) etc):

The last five years at the University I studied to "study" to investigate much time into engineering knowledge. We had a lot of group and team works, and had to bring to proof that teamwork is possible, and helps us to reach the aim.