



**ENGINEERING and INDUSTRY
INNOVATIVE TRAINING FOR ENGINEERS
(ENGINITE)**

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Guidebook for Mentors

Contributors

The ENGINITE Consortium,
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1. Introduction

The aim of this guidebook is to support mentors, who are guiding the ENGINITE participating engineers during their 3-months structured internship placement in an engineering company. The guidebook gives an overview of the ENGINITE programme, including the preparatory courses that the participants will have completed before they begin their structured internship. It then provides suggestions for ways to support the participants during their internships.

1.1. What is ENGINITE?

The European ENGINITE project (<https://www.enginite.eu/>) invites the submission of applications of interest by graduate engineers to participate in a postgraduate vocational training programme which will be held during 2018-19. The postgraduate vocational training programme will be based on Problem Based Learning (PBL) pedagogy and will combine advanced applied academic topics with hands-on aspects, in order to endorse the needs of graduate engineers, preparing them for the industry of the 21st century. Grounded on the PBL approach, the ENGINITE postgraduate vocational training programme will contribute to the career and employability skills development of the new engineers – among others: innovation, entrepreneurial skills, efficient quality, health and safety management, problem solving, communication and presentation skills – while it will enhance technical knowledge in critical fields of engineering. Upon the completion of the training programme, participants will be able to enter the labor market, lead multidisciplinary teams, and provide added-value and substantial contribution to their organizations (e.g. engineering companies and industries).

The postgraduate vocational training programme is addressed to graduate engineers with a degree in biochemical, chemical, electrical, electronic, environmental, food, industrial, mechanical, petroleum, safety engineering and/or of a relevant field. Eligible will also be Chemists and Food Technicians graduates.

The target group postgraduate vocational training programme includes:

- Graduate Engineers, who seek for a job and/or who wish to follow a post graduate/vocational training programme
- Junior Engineers, who are partly-employed and/or working in a different field and wish to follow a post graduate/vocational training programme

During the program, Industrial Partners in the engineering sector are going to provide internship placements and the following categories are welcome and eligible:

- Companies which seek for professional graduate/ junior engineers for employment
- Companies which experience lack of innovative ideas and seek for talented engineers who can provide solutions to existing problems and/or promote new ideas/products towards helping the companies to enhance their competitiveness and further grow

1.2. Participants' preparation for their structured internships

As a preparation for their structured internships, ENGINITE participants will have previously completed a three-month training programme aimed at employability enhancement & managerial (soft) skills [4 courses] as well as at technical knowledge enhancement [4 courses]. Each course, will last for one day online and a week face to face, and will be implemented through a blended model based on the use of an online learning platform combined with face-to-face meetings.

All the courses in this three-month training programme have been design using Problem-Based Learning, in which the learners lead their own learning process. Problem-Based Learning allows engineers to identify their own problems to solve and supports them as they find their own way to a solution - much how professional engineers work in practice.

Please review: Programme Specification.

1.3. Aim of the Structured Internships

The second part of the ENGINITE programme is a three-month structured internship via the placement of the trainees in Industrial Partners/Companies for accelerating hands-on experiences in the industry and consolidating the technical knowledge/soft skills which will be gained during the first part of the program.

During the internship, the trainees will have the opportunity:

- (a) to become familiar with the operations, equipment, process of the companies/industrial units which will be placed in,
- (b) to work on small scale projects as indicated by their mentors and company representatives, and
- (c) to work on self-initiated projects/proposals in collaboration with their mentors and company representatives.

Please review: Programme Specification.

1.4. What a participant can get out of a structured internship

The structured internship is a crucial stage in the ENGINITE programme. It is an opportunity for a trainee to experience for the first time working in a real engineering workplace. It is the chance to develop professional skills needed to be a successful engineer.

For the host organization, it provides the company with an affordable valuable resource that it can deploy to help tackle organizational challenges. For the ENGINITE trainee being hosted, it is a chance for them to prove their value as potential future employees.

The internship is intended to be an opportunity in which participants can spend time in an organization, look for problems that need to be solved, and using their training, propose solutions that are hopefully of value to the host organization. The internship is above all an opportunity to do some real engineering problem solving.

The internship also provides participants with the opportunity to demonstrate and develop their professional skills: independence and initiative; teamwork and collaboration; personal organization; responsibility and commitment; ethical behaviour and decision-making; and, effective communication.

Finally, the internship will offer trainees the chance to develop their knowledge of: the host organization and how it functions; how the organization fits into its broader sector of industry; company policy and how it affects policy; and, company culture and how it affects decision-making.

1.5. What will the participant be doing?

The three-months structured internship has a three-stage structure. During the first month, the trainee will get to know the operations, equipment and procedures of the company (Stage 1). In the second month, the trainee will be engaged on small-scale projects as indicated by her/his company supervisor or mentor (Stage 2). In the third month, the trainee will work on a self-initiated project with the support of her/his company supervisor or mentor (Stage 3).

2. What is expected of you?

As a mentor, it is your role to support the ENGINITE trainee on their learning journey, during their three-months structured internship. It is expected that the trainees will work semi-independently during their internship, so the role of the mentor is not to be their boss: it is more to guide them on how they use creatively yet professionally their time, and what they are gaining during this interesting process in the company.

The next part of this guide suggests how you can best support the ENGINITE trainee(s) that you are mentoring.

2.1. Getting started in the company

The first days in a company internship can be daunting. There is lots to learn about quickly, and trainees may not want to ask questions because they may feel they are being stupid or an annoyance.

It is likely that the trainees will receive a general introduction and health and safety training/induction, according to the nature of their works. Beyond these basic inputs, there is much more information that the trainee will need in order to feel confident in their new setting. One way to support participants at this early stage is to make a more detailed investigation of the business one of their first tasks. The investigation could cover topics such as:

2.2. What the company does?

Find out about the company: What does the company do? Example projects? What is the core business along with the main process/activities dealing with? What is their capacity? What are the different job roles? Who are the customers or clients? How do you train to get into the job? Which countries does it operate in? How many members of staff?

Career progression

What are the different career paths within the business? What are routes to professional development? Who in the company has taken different paths - introduce them. Are there networking events/external events where people can meet people in a wider context?

Company policy

What are the company policies? What is the company's sustainability policy? How does this impact upon the way decisions are made? Are they any strategic social responsibility actions?

Financial arrangements

What is the company's size/turnover? What are the different revenue streams? What are the company's main costs and what are its assets?

Company culture

What is the company's culture? How is it reflected in the brand and symbols the company uses? How is the culture reflected in the stories the company tells about itself? How is the culture reflected in the way the company is organized and controlled?

2.3. Finding their own project - setting a target

Trainees in the ENGINITE programme have been trained to identify their own problems to work on (the hosting company's problems for time being) and to work towards finding a solution. The placement is the chance for them to apply these problem-solving skills in a professional context.

It is not expected that trainees will immediately find a problem that they want or be able to solve. It is more likely that the problem will emerge during their first two months in the organization and may need to be redefined and clarified several times before the trainee can make any progress.

You can support trainee as they identify a problem that needs addressing by asking them the following questions:

- What results do I want to achieve through my project work?
- What makes it worthwhile or interesting, and for whom?
- Who shall be engaged as my co-actors/workers? Do others need to be informed?
- What must I do, when and how?
- How will I know if my goal has been accomplished or my intentions fulfilled?
- Do I see the project as fairly easy or fairly difficult?
- What learning is to be gained from the project?

2.4. Reflective learning during their project

ENGINITE trainees have been through a reflective learning process in their three months of training.

Reflective learning is the difference between the trainees simply experiencing the workplace and them learning from their experiences. It is through reflection that trainees can start to see how theory and reality map together.

An important role for the mentor is to support the trainee through this reflective process. It is recommended that the mentor meets with each trainee once a week, physically or online (e.g. via Skype) to help them reflect on their weekly experiences. Use the following suggested questions to prompt participants into reflective thinking:

1. What evidence have you collected so far about the impact of your plans?
2. Have there been any unintended outcomes of the project, for example, things that you did not expect to learn?
3. Do you need to adjust your plans? For example, in reality did circumstances make you act contrary to your original intentions?

Keeping some sort of workplace diary will help participants to remember more of what is going on day-to-day and be able to structure their reflective learning more systematically. To structure the content of the reflective diary, trainees should record each day quick answers to the three questions above.