Institute of Science and Technologie

Department of Science and Technology / Study: Process Engineering Module: Engineering professions / Semester 2 / Section A

Chapter I:
Engineering sciences. It is what?

1.1. Definitions

A profession: it is a human activity, most often for profit. It is also an acquired expertise and when the profession allows it, an improvement of this knowledge.

A science: Coherent body of knowledge relating to certain categories of facts, objects or phenomena obeying laws and/or verified by experimental methods.

Technique: All applications of scientific knowledge to the production of needs and utility products.

Technology: Study of industrial techniques considered as a whole or in a field of activity.

Knowledge: This is all the general or specialized knowledge required to carry out an activity. This may be theoretical knowledge, techniques or tools necessary to solve a given problem. Example: academic knowledge, knowledge of languages, computer knowledge, etc. Knowledge answers the question “I know, I have learned…”.

Expertise: This is the set of technical capabilities that enable the accomplishment of a task. Acquired during more or less long experiences, not only through salaried work, but also through associative activities, as well as all activities carried out in daily life. Example: operating a machine, carrying out audits, carrying out statistical analyses, repairing computer devices, etc.

1.2. The profession of engineer

A profession is the exercise by a person of an activity in a specific field, which involves professional expertise, daily tasks, responsibilities and remuneration. A job is not limited to salary, social status and working hours.

It involves specific work, which distinguishes it from other professions, and which requires specific skills. A profession develops: we progress with the experience and the investment we have put into it, we strengthen our skills, this becomes our expertise, which can be used by different clients.

1.2.1. What is the job of an engineer ?

Above all, the role of the engineer is to resolve the technical, concrete and often complex problems posed to him.

To do this, he has solid knowledge acquired during his training and know-how inherited from his experience.

1.2.2. Job missions to become an engineer

Engineers play a role in creating most of the products we own. They can practice in various sectors of a company. This versatility in the professional environment allows them to build diverse career paths throughout their career.

The continuous progress of technologies and the technicality of equipment, as well as the significant resources invested in certain devices, push companies to hire more and more engineers, often to the detriment of technicians and other experienced professionals.

The engineer's missions are as follows:

• Monitor and support a specific project (product, system, service) from its development to its implementation. It proceeds at each stage of the production chain,

• be able to justify the various technical malfunctions linked to the launch of the project and work to resolve them,

• Specialist in the entire industrial chain, the engineer ensures the conformity of the product or service, as well as compliance with the specifications. Enabling the best competitiveness of the concept on the market is among its priorities,

• understand all the possible implications of the project (budgetary, human, commercial, environmental) and provide appropriate solutions.

1.2.3. Qualities required to become an engineer

The numerous responsibilities of the engineer require that they have advanced technical knowledge, particularly economic, human and environmental. He thus has an infallible general and scientific culture.

In addition to his technical skills, the engineer must demonstrate developed capacity in personnel management, project and business management. More than an expert, he is also a manager.

He spends a large part of his working time studying the project according to the human, economic and financial constraints it involves.

This position of responsibility also requires mental strength and significant work autonomy. Working hours are variable and the engineer must demonstrate flexibility and adaptability.

1.2.4. Training needed to become an engineer

Today, engineering school remains the safest route to entering the profession. The university course extends from three to five years depending on whether admission takes place directly after the baccalaureate or after two years of scientific preparatory class. Thus the technical master's degree.

1.2.5. Engineering job fonctions

The engineering profession is an evolving profession that requires skills, intuition, methodology and a great capacity for adaptation. The engineer can perform several functions such as:

- ❖ Design,
- ❖ Production,
- ❖ Operation,
- ❖ Maintenance,
- ❖ Distribution,
- ❖ Technical sales or after-sales service.

1.3. History and challenges of the 21st century:

We are in the 21st century and the technical engineer is out of fashion. The engineering profession is no longer limited to conceptual and technical skills. The engineer is no longer an engineer once and for all.

The 21st century engineer must transform the company's existing products and services into new products and services. It is now at the center of applied research and therefore innovation.

He manages the life cycle of the products and services in the company's catalog in collaboration with the marketing teams to ensure that customer expectations are taken into account in his innovation process.

He must evaluate the commercial potential of his innovation, participate in the development of the commercial strategy and the marketing of his innovation.

He must manage teams in strict compliance with occupational health standards to provide quality after-sales service to customers with a view to their loyalty in order to guarantee the growth of his company.

It negotiates national and international partnership agreements to ensure the expansion of its innovation internationally in a globalized world.

The new constraints of the 21st century require that engineers no longer have their only compass other than their ethics, their values and their aptitude for human relations. They must have the necessary charisma and be as comfortable with top management as with colleagues and subordinates.

1.4. Search for a job (profession)

Finding a job is not an easy mission in a tense economic context. To be effective, know that it is not the quantity of applications sent, but their quality that will make the difference. Exploration, organization and preparation: these are the three key steps to succeed in aiming correctly and convincing:

1.4.1. Target your search

First of all, it is important not to spread yourself too thin, but to focus on what you are looking for and be able to explain it clearly. A recruiter receiving an application that does not match what they are looking for will eliminate it very quickly.

1.4.2. Organized

Organization is essential in a job search. This includes taking careful note of all the details of each position and each application submission.

Good organization also includes regularly updating your profile on job sites and using a specific email box to send your application and collect responses.

1.4.3. Prepare

Before any interview with a recruiter, you should prepare yourself. You must collect as much information as possible on the position to be filled, the missions, the contact, the company's

activity, its results, its market, its functioning, its values, etc. in order to show your seriousness and your motivation when of maintenance.

1.5. Search for a recruitment ad by keyword

Using keywords allows you to perform a targeted search. A keyword can be a job title, a particular skill, the name of a company or a locality.

1.5.1. How Keywords Can Get You a Job?

A keyword, when used for job searching, is a word or term that is related to the type of job you are looking for. When you search for a job by keyword, all positions containing the word or term you entered will be listed in the post. Using keywords can help you weed out tasks that don't fit and allows you to search more efficiently.

Most job boards allow job seekers to search for job postings by keyword and location, as well as more advanced search options.

If you're looking for electrical engineering jobs, you can use terms like "electrical engineer" or "electronic engineering," plus your location and other search criteria like position type or required experience.

When you have skills that can be used in various roles, search by terms that describe your skill set to find jobs that match.

1.5.2. Keywords to use

It depends on your field and the type of job you want. Here are some of the keyword categories you can use to narrow your search:

• **In the field or in industry**: Although this does not limit the results too much, start by defining the field or industry you want to work in, for example “telecommunications engineering”. Once you see results, you can add more keywords to ensure more relevant results, and a slimmer list of jobs to browse.

• **Location:** It’s up to you how specific you would like to be. You can put in a city, or even a zip code. You can search by location using advanced search options, available on most job sites.

• **Desired job title:** You can try putting in your desired job title, but keep in mind that not all companies use the same titles. A company may call it the "project coordinator" position. Try different variations to see what generates the best results.

• **Skills, Tools, and Industry Specific:** In addition to searching by job title, you can search based on the features a job requires. For example, you can search by a programming language or the skills required to do the job.

• **Company Names:** If you happen to have a dream company you'd like to work for, or a giant multinational corporation that you know has a lot of openings at any given time, you can search directly by name business.

• **Job Type:** When you are searching for a specific job type, you can narrow down the search results by defining terms like full-time, part-time, contract, freelance, internship, distance...etc.

1.5.3. Keywords for job search

Cover letter keywords: Your cover letter will be searched for keywords if you submit it to a job site. Here's how to use skills, results and recognition keywords in your cover letter to increase your chances of being selected for an interview.

Resume Keywords: Most companies use recruitment management software to screen candidates for job openings. Resume keywords are the words that hiring managers search for when browsing their resume database. Here's what you need to know about resume keywords.

1.6. Develop a simple job description

This is an HR document covering all the activities and tasks of an employee for a given workstation. It formalizes the missions and related skills for each job as well as all the useful information for the different uses.

A job description is a communication tool allowing you to present a description of the different characteristics of a position and its environment, namely:

• Job title,

• Company Name,

• Position in the organization chart,

• The environment and working conditions (workplace, pace of work, etc.)

• Access to the position and conditions of engagement (e.g.: salary, type of contract, location, working time, hours, etc.)

• Description of missions and activities (frequency and importance),

• The desired training and experience,

• Required skills (knowledge, know-how, interpersonal skills),

• The difficulties of the position,

• Relations with other positions,

• Compensation

Example 1- Electrical studies engineer

Job title: Electrical studies engineer

Company: Softal – Construction

Domain: Growing industrial engineering company

Workplace: Algiers

Job duties:

• Develop specifications,

• Prepare the list of deliverables for engineering studies with the CEE,

• Participate in adjusting the schedule for submitting studies relating to your specialty,

• Check the technical documents provided by the client (studies, technical specifications, etc.),

• Develop electricity batch engineering studies (high current),

• Size the electricity batch equipment (technical specifications),

• Dimension and calculate electrical networks,

• Define electrical equipment and accessories,

• Define the principle diagrams (general distribution and electrical cabinets),

• Establish detailed execution plans for electricity networks.

Develop engineering studies:

• Establish lists of project supplies,

• Define the technical specifications of project supplies,

• Attend project negotiation meetings with the client,

• Attend project coordination meetings,

• Carry out site visits to assist the project manager,

• Take charge of modifications and additional engineering studies of the Electricity lot requested by the customer,

• Prepare the technical documentation for the Electricity lot required for the execution of the project.

Required profile :

• Graduate of higher education, preferably an electrical, electrotechnical, electromechanical or electronics engineer,

• At least 5 years of study experience.

Required Skills :

• Software mastery: Autocad and REVIT,

• Sense of organization, communication and group leadership,

• Ability to listen and take initiative.

Example 2- Electrical design engineer

Job title: Mechanical engineer

Company: Lift Systems

Sector of activity: Distribution and trade of production equipment

Workplace: Algiers

Type of contract: Mission

Main tasks :

• Assists and advises his superiors in decisions relating to diagnostics, equipment assessments and repair methods,

• Ensures preventive maintenance of production equipment,

• Ensures the adjustment of mechanical assemblies and sub-assemblies,

• Visits equipment related to his field on a daily basis and corrects any anomalies noted,

• He intervenes to troubleshoot production equipment, at the request of his superiors,

• Proposes any modifications or improvements to good maintenance practices for production equipment,

• Ensures the preservation of tools,

• Reports daily on the work carried out,

• Completes intervention reports and succinctly analyzes its activities.

Required profile :

• Hold an engineering degree in mechanical engineering or equivalent,

• Have experience in the field of elevators and goods lifts.

Required Skills :

• Masters maintenance practices and continuous improvement techniques,

• Desired knowledge of SolidWorks software,

• Sense of initiative,

• Team spirit,

• Sense of human relations