

Feyziye  
Schools  
Foundation  
1885



**IŞIK UNIVERSITY**

Department of Industrial Engineering

INDE2910 - INDE3910  
Industrial Training Guidelines  
for Internship Report

*Name*

*Student*

*ID Date*

**BRIEF**

Fill out below the summary information regarding your industrial training. A company seal and the supervisor's signature must be placed on this page.

**Course Code for the Internship:** INDE2910  INDE3910

**Company Name:**

**Company Address:**

**Starting and Completion Dates:**

**Department(s) Worked In:**

**Supervisor's Name, Position, Phone Number, Email:**

## TABLE OF CONTENTS

1	WEEKLY WORK PLAN.....	3
2	INTRODUCTION.....	5
2.1	The Company and Corporate Partnership.....	5
2.2	Industrial Sector and Customers.....	5
2.3	Technology in Manufacturing and Services.....	5
2.4	Organization.....	5
3	OVERALL ANALYSIS.....	7
3.1	Input / Output Analysis.....	7
3.2	Layout.....	7
3.3	Location.....	7
4	MANAGEMENT INFORMATION SYSTEM.....	9
4.1	Decision Making.....	9
4.2	Decision Support Systems.....	9
5	MANUFACTURING SYSTEM.....	11
5.1	Materials.....	11
5.2	Manufacturing Mode.....	11
5.3	Shop Layout.....	11
5.4	Material Handling.....	11
5.5	Manufacturing Processes.....	11
5.6	Manufacturing Costs.....	11
5.7	Productivity.....	11
5.8	Production Planning and Control.....	12
5.9	Inventory.....	12
5.10	Resource Allocation.....	12
5.11	Workforce Requirements.....	12
6	SERVICE SYSTEM.....	13
6.1	Process and Information Flow.....	13
6.2	Process Classification.....	13
6.3	Back Office.....	13
6.4	Costs.....	13
6.5	Productivity.....	13
6.6	Service Operations Planning and Control.....	14
6.7	Planning Decisions.....	14
6.8	Inventory Management.....	14
6.9	Demand Smoothing.....	14
6.10	Queues.....	14
6.11	Workforce Planning.....	14
7	QUALITY PLANNING AND CONTROL.....	15
7.1	Quality of a Product or Service.....	15
7.2	Quality Features.....	15
7.3	Quality Assurance.....	15
7.4	Quality Assurance Tools.....	15
7.5	Cost of Quality.....	15
8	INDUSTRIAL ENGINEERS AT WORK.....	16
8.1	Observation of Daily Activities.....	16
8.2	Interviews.....	16
9	PROJECT PROPOSAL.....	17
10	CONCLUSION.....	18
10.1	Conclusion.....	18
10.2	Işık University Graduates at Workplace.....	18
10.3	Short Evaluation.....	18

## 1 WEEKLY WORK PLAN

Fill out the following tables. Summarize **your** tasks, responsibilities and accomplishments for each week. Resize the tables as needed.

### Week 1

Department(s)	Tasks, Responsibilities, Accomplishments

### Week 2

Department(s)	Tasks, Responsibilities, Accomplishments

**Week 3**

Department(s)	Tasks, Responsibilities, Accomplishments

**Week 4**

Department(s)	Tasks, Responsibilities, Accomplishments

## 2 INTRODUCTION

### 2.1 The Company and Corporate Partnership

What is the full title of the company? Give a short history of the company. Include details such as when it was founded, where it is located, total number of employees, aggregate production (service) capacity, total area its facilities occupy. Is the company a joint venture, a franchise, a part of a holding company or a part of a multinational group?

### 2.2 Industrial Sector and Customers

Specify the sector in which the company operates. What share does the company hold in the domestic market and (if any) international markets? What are the typical products the company manufactures and/or the typical services the company offers? Provide definitions and descriptions of the products and/or the services.

Who are regarded as the customers of the company? Is it consumers (the end users), retailers, other businesses, its own employees, etc.?

### 2.3 Technology in Manufacturing and Services

*(If the company operates in manufacturing sector)* List the manufacturing processes the company uses and describe these processes.

*(If the company operates in service sector)* List what kind of machines or equipment are used to provide services.

**Note:** Answer both questions if the company operates in both manufacturing and service sectors.

### 2.4 Organization

**Draw the organization chart of the company.** List the departments of the company along with the number of employees and the number of industrial engineers in each. Describe the main function of each department, its responsibilities, and its duties. Identify which departments are directly responsible for essential activities of manufacturing products or providing services for the customers of the company and which departments are responsible for activities that support other departments. Note that the number of IEs in a department can be zero.

**Provide a list of functions performed by the industrial engineers in the company and describe these functions shortly.** If there are no industrial engineers in the company then list and shortly describe those functions that are performed by others in the company that would be best performed by industrial engineers.

Use the tables below, resize them and make more copies as needed.

Department	
Number of Employees	
Number of IEs	
Main function, responsibilities, duties of the department	
Functions and responsibilities currently performed by or would potentially be best performed by IEs	

Department	
Number of Employees	
Number of IEs	
Main function, responsibilities, duties of the department	
Functions and responsibilities currently performed by or would potentially be best performed by IEs	

Department	
Number of Employees	
Number of IEs	
Main function, responsibilities, duties of the department	
Functions and responsibilities currently performed by or would potentially be best performed by IEs	

### 3 OVERALL ANALYSIS

#### 3.1 Input / Output Analysis

*If your company is a manufacturing company:*

- Describe the products manufactured by the company.
- Identify major items of input of the production system you have observed. Specify their sources and how they are supplied (e.g. source of inputs, means of transportation, volume and frequency of deliveries, usage rates etc.).

*If it is a service company:*

- Describe the services provided by the company.
- Identify the input(s) of the service system, as well as their sources.

#### 3.2 Layout

Identify the major facilities of the manufacturing/service company you observed during your summer practice on a **sketch**.

#### 3.3 Location

Rate the factors given in the following table based on their importance for selecting the current location of the facility. You may add any other relevant factor if you want. After filling out the table elaborate on your evaluation; explain why you picked the given rating for each factor for this company and situation. You are encouraged to use sketches, tables, graphs or maps.



	Very Important	Influential	Unimportant
Distribution needs for the products			
Availability or physical characteristics of raw materials			
Physical characteristics of the products			
Labor availability and quality			
Transportation facilities			
Proximity to suppliers			
Flexibility			
Competitive Positioning			
Demand Management			
Access			
Visibility			
Traffic			
Parking			
Expansion			
Environmental factors			
Laws, taxation, incentives, government politics etc.			
Cost of land and buildings			

## 4 MANAGEMENT INFORMATION SYSTEM

Every organization has an information system which is designed to meet its information requirements. They collect, process, analyze, and use information to manage their operations effectively and efficiently. For the department you intern in, give examples of information collected that is considered most important for the department.

### 4.1 Decision Making

Management information system should support decision making at three different levels. For each level listed below give at least two examples of decisions. For each decision you select, describe the decision makers (individual or group in the organizational structure), approximately how often it is made, what kind of information is compiled as an input for the decision.

- a) Strategic level decisions (e.g. plant expansion, determination of product lines, mergers, diversification, capital expenditures, etc.).
- b) Tactical level - implementation of plans (e.g. allocation of resources to different products, formulation of budgets, funds flow analysis, plant layout decisions, personnel problems).
- c) Operational level, day-to-day routine operations (e.g. receiving and shipping operations, scheduling, inventory control, quality control and allocating workers to jobs).

### 4.2 Decision Support Systems

Give examples of software used in the company extensively in decision making. Explain how they are used and which areas of performance they aim to improve. Add screen captures if possible.

Investigate whether the company is using any decision support system (DSS) for optimization or scientific forecasting specifically to solve operations research problems. Resize and use the below table to summarize each DSS tool.

DSS	Decision type (Strategic/ Tactical/ Operational)	Usage frequency (Daily, weekly, monthly, yearly)	Developed by (Internally or third party)	Used by (Departments)	Number of users	Used for (Describe)

## **IMPORTANT!**

**If your company is a manufacturing company, continue with Section 5. If it is a service company, skip to Section 6.**

**If your company operates in both manufacturing and service sectors, choose only one of them and proceed to the relevant section.**

## **5 MANUFACTURING SYSTEM**

### **5.1 Materials**

Provide a schematic representation of the material flow of a particular product in your practice organization. Note that your diagram should include the complete flow from raw materials inventory through finished goods inventory with every point of conversion (workstations, stock points) being indicated. If your product is made from multiple components/modules then indicate all major parts and also include a *Bill-of-Materials* diagram.

### **5.2 Manufacturing Mode**

Classify the mode of production in your practice organization as one or some combination of the following: *i)* Continuous Process, *ii)* Flow Shop, or *iii)* Job Shops, Batch Shops and Project Shops. Describe your reasons in detail.

### **5.3 Shop Layout**

Classify the layout of your practice organization as one or mixture of the following: *i)* Product Layout,

*ii)* Process Layout, or *iii)* Fixed-position Layout. Describe your reasons in detail. Provide a diagram of the manufacturing shop, machines and material transport equipment. Discuss the type or combinations of the types of layout you have observed in your practice organization. Support your points using sketches.

Check the following website for a brief definition of these layout types:  
[http://wps.pearsoned.co.uk/ema\\_uk\\_he\\_slack\\_opsman\\_4/17/4472/1144918.cw/index.html](http://wps.pearsoned.co.uk/ema_uk_he_slack_opsman_4/17/4472/1144918.cw/index.html)

### **5.4 Material Handling**

Identify some of the materials handling equipment in the plant and state where and for what purposes they are used. On a layout drawing, identify a path followed by any one of the materials handling equipment.

### **5.5 Manufacturing Processes**

Describe the manufacturing processes (operations) to produce products/parts and the machines used in these processes. If there are assembly operations describe them as well.

### **5.6 Manufacturing Costs**

Explain how unit-manufacturing costs are calculated in your practice organization and provide an example with numeric values.

### **5.7 Productivity**

Productivity is usually defined as the ratio of output to inputs in production. Labor productivity (the value of goods produced in a period of time divided by the hours of labor used) and material productivity (amount of economic value generated by a unit of material input) are some instances of

*productivity measures.* Describe and compute appropriate productivity measures for your practice organization.

### **5.8 Production Planning and Control**

Would you classify the production system of your company as Make-To-Order, or Make-to-Stock, or a combination of both? Elaborate your answer.

Describe how production plans are developed, implemented, and controlled. Considering the causes that can disrupt a production plan, list things that can go wrong.

### **5.9 Inventory**

State three different items kept in stocks in your practice organization. What requirements do they serve, or what causes them? Use a graph to plot the inventory on hand (i.e. in the storage or use areas within the facilities of the company) versus time for at least one of these items. Do you observe any pattern? How can you explain that pattern (or none)? Supply your sources of data used in the plot.

What difficulties do you observe with regard to managing inventories? Describe the costs associated with maintaining inventory.

### **5.10 Resource Allocation**

When and how to produce is another subject in decision making process of production planning and control. This set of information conveys the decisions related with the allocation of scarce (limited) resources needed for production.

What resources are considered as scarce in your practice organization? Name a few. How are their uses planned?

### **5.11 Workforce Requirements**

How do the managers plan the workforce requirements (shifts, new employments etc.)? What kind of impact does capacity and demand have on these planning activities?

## 6 SERVICE SYSTEM

Using a process diagram describe the service processes as the flow of customers and/or information. Do you think that some service bottlenecks present? If so, where do you think the service bottlenecks are in the company? Where do you think equipment or people need to be added, or how the process could be altered to alleviate these bottlenecks?

### 6.1 Process and Information Flow

Pick a particular service and draw a schematic representation of the process flow of a typical customer receiving this service. On the same diagram indicate the information flow between business units and entities of the company. Note that your diagram should include the complete flow starting from the time when the customer requests a certain service process till he/she leaves the service facility after having his/her request fulfilled.

### 6.2 Process Classification

Classify the service process in the Service Process Matrix. This classification uses two factors: (i) labor intensity, and (ii) degree of interaction and customization. In this matrix each factor has as a high or a low value which yields a total of  $2 \times 2 = 4$  classes. These classes are named service factory, service shop, mass service, and professional service (check below table). Explain the type of operations in the company with respect to the classification given in the service process matrix. Place your company in one of the four cells of this matrix. Discuss why you made your classification; give examples of companies/industries that have the same classification as your company or contrast your company to others that do not have the same classification.

Service Process Matrix		Degree of interaction and customization	
		Low	High
Labor intensity	Low	<i>SERVICE FACTORY</i>	<i>SERVICE SHOP</i>
	High	<i>MASS SERVICE</i>	<i>PROFESSIONAL SERVICE</i>

### 6.3 Back Office

If your practice organization has the back office as an important component of the whole service, then identify the equipment used in the back office and state where and for what purposes they are used.

### 6.4 Costs

Explain how unit-service costs are calculated in your practice organization and provide an example with numeric values.

### 6.5 Productivity

In service business, productivity is usually defined as the ratio of the value of services to

inputs used. Labor productivity (the value of services generated in a period of time, divided by the hours of labor

used) and material productivity (economic value of services generated, divided by input materials/machines used) are some instances of *productivity measures*. Describe and compute appropriate productivity measures for your practice organization.

### **6.6 Service Operations Planning and Control**

Describe how service operations plans are developed, implemented, and controlled. Considering the causes that can disrupt a service plan, list things that can go wrong.

### **6.7 Planning Decisions**

State subjects of typical decisions on the types and volumes related to some specific services of your practice organization. Who make(s) these decisions? How are the decisions recorded and transferred to others in the organization? What is the basis for these decisions?

### **6.8 Inventory Management**

If back-office is dominant in your practice organization, state which items are kept in stocks. What requirements do they serve, or what causes them? Use a graph to plot the inventory on hand (in the storage or “use areas” within the facilities of the company) versus time for at least one of these items. Do you observe any pattern? How can you explain that pattern (or none)? Supply your sources of data used in the plot. If no inventory is kept, explain why.

### **6.9 Demand Smoothing**

What techniques are used in your practice organization to smooth the demand? Give examples for specific services.

### **6.10 Queues**

State when queues of customers are allowed in your practice organization. What causes them? Use a graph to plot the number of customers waiting for a certain service versus time. Do you observe any pattern? How can you explain that pattern (or none)? Supply your sources of data used in the plot.

### **6.11 Workforce Planning**

Does the demand of certain services have a “seasonal” pattern? Does your summer practice organization adjust the workforce level according to the varying demand? Explain how the workforce level is planned.



## **7 QUALITY PLANNING AND CONTROL**

### **7.1 Quality of a Product or Service**

**Choose a product/service** and explain how the organization defines its quality. How would you define it? How are customer requirements translated into service specifications (or characteristics)? Provide examples.

### **7.2 Quality Features**

Quality control is exercised at all four stages of a product/service life cycle:

- a) Product/service design stage (innovation, robust design, tolerance design)
- b) Manufacturing/service process design stage (innovation, robust design, tolerance design)
- c) Manufacturing/service delivery stage (detecting problems and correcting them, compensating for known problems, screening undesirable products.)
- d) Usage stage (warranty and repair).

Describe the quality control activities that take place throughout the life cycle of the chosen product/service.

### **7.3 Quality Assurance**

What kind of quality certifications does the company hold (such as TSE, ISO certifications etc.)? What is the goal of each specific certification? Explain how they achieve these goals and how they measure it.

### **7.4 Quality Assurance Tools**

How do the engineers control and inspect the quality in every process step? What are the tools (software or hardware) they are using? Use a specific product or service as an example.

### **7.5 Cost of Quality**

What kind of quality costs is the company facing through the lifecycle of the product or service (such as planning, training, material, legal etc. costs)? Explain in details. Try to get an estimate of these costs.

## 8 INDUSTRIAL ENGINEERS AT WORK

### 8.1 Observation of Daily Activities

Identify the most appealing position to you at the company. Observe a professional who has this position, and narrate your observations. You may want to mention his/her tasks/responsibilities, the decisions he/she needs to make on a regular basis, how he/she lives a typical workday, %breakup of activities, who he/she manages, who he/she reports to, who he/she interacts with most, and which background and skills he/she needs, and so on.

### 8.2 Interviews

Interview **two** industrial engineers at the company: Arrange appointments; prepare questions before-hand, and have the interview. Be creative in your questions. The process does not have to be a question/answer session. Try to find open-ended questions and let the interaction become more of a conversation and let the person you are interviewing talk about their professions, career, suggestions, vision for the future of the profession.

Here is a sample list of questions; you do not need to use all or even any of them:

- a) Can you tell me about your education life? What degrees from which schools do you hold? What are the years of these degrees?
- b) Can you tell me about your career? In which positions, for which companies and for what periods of time did you work before? Which one of those provided you skills and background that helps you fulfill your responsibilities today at this position?
- c) How do you like your current position? Can you use all of your skills and experience in this position?
- d) How do you like this company? What can you tell me about the corporate culture at this company? What business practices do you like or dislike? What do you think this company does well, compared to its competitors? What about the things that should be improved?
- e) Do you think that the IEs in Turkey and in particular in this sector of business are employed in jobs that are most suited for them? Do you think that the managers know enough about the profession of industrial engineering? How do you see the future of industrial engineers?
- f) What would you recommend to a prospective IE in preparing for and shaping their career? What would be the most essential skills soon-to-be graduates should aim to acquire? What do the hiring executives look for in new graduates? What makes a candidate better than others in the interviews and hiring process?
- g) How important do you think the functions performed by IEs in this company are for the success and improvement of it?
- h) Would you study industrial engineering again if you were getting a degree today? Why?
- i) What knowledge from your classes did you have a chance to use in your job?
- j) What course(s) would you take if you could go back to university?

## 9 PROJECT PROPOSAL

**IMPORTANT: Section 9 must be answered by only IE390 students.**

Observe the organization from a critical perspective and write a one to two page description of a specific, current IE problem in the company that you observed. That is, identify one or more problems for which improvements would lead to a more successful organization. Describe these problems and discuss why they are important for the company. What kind of benefits would the company receive by solving these problems? What types of approaches would you consider to solve these problems? What kind data would you collect and what kind of analysis would you perform if you were asked to implement one of those approaches? What kind of problems do you foresee in the data collection analysis process?

*Note that you are not expected to resolve the problem in this report.* Neither you have to use this topic as your IE490 Senior Project topic, nor do you need to find any other topic from this company. Nevertheless, you must demonstrate that you have a critical view of the company and the way it operates. You need to show that you can find links between the way to improve the operations of the company and the classes you have taken in your IE curriculum.

## 10 CONCLUSION

### 10.1 Conclusion

Summarize your observations about the organization, the workplace, and your impressions of the professional life. Describe the ways this internship helped you improve yourself and what its contributions are to you.

Answer the following questions that are prepared to obtain your own assessment of the summer practice:

- Would you like to work in a company like this one in the future? Why?
- Would you like to work in the industry this company is a part of? Why?
- How would you like to work full-time in the department(s) you had observed? Which one(s) are most suitable to your liking and skills, and why? If you had another four weeks of time in the same company, what would you be occupied with and why?
- What do you expect to learn in your future training as an industrial engineer that will help improve your understanding of production systems? How can you further develop your capability of handling problems of these systems?
- Drawing on your experience of this practice, discuss the differences between industrial engineering and other engineering disciplines with respect to their responsibilities and ways of approaching their duties in the production environment.
- Discuss top management's impression and attitudes towards industrial engineering functions and activities.

### 10.2 Işık University Graduates at Workplace

Is there any ISIK University graduates working in the company that you intern for? Which departments do they work at? Provide their job title and contact information.

### 10.3 Short Evaluation

Answer the following questions on a scale from 1 (worst) to 5 (best).

	1	2	3	4	5
Would you recommend others to do their internship in this company?					
How would you rate your internship?					
Was your internship helpful?					