

INDUSTRIAL INTERNSHIP GUIDELINES

1.1 Background

The amending of learning method of material-based approach towards the competency-based approach coloring the changing of Industrial Engineering Curriculum that applied in 2009-2014 academic period. In 2004-2009 academic periods, there are three competency groups that want to be applied to the student which is the Key Competences, Support Competences and the Supplementary Competences.

The Key Competences are the main identifier of the Industrial Engineering graduates. These competences include:

1. Analytical skills
2. Synthetic, integration and design skills
3. Managerial skills
4. Problem-solving skills

The second group is the Support Competences, learns about the soft skills that very important for implementing the Key competencies. The competences include:

4. Intrapersonal & communication skills
5. Developing-IT skills
6. Master the English language and/or the other languages.

The third group is the supplementary competences. These competences group is expected to complement the Industrial Engineering's competence graduates.

1. The ability to accommodate the environmental and sustainability issues
2. Innovation skills

This student internship is one of the subjects in IE that weighted 2 credits. The objective of this subject is to introduce the students to the field of Industrial Engineering and train the students to solve the problem that common in industry. Knowledge and skills that they earn in class also useful for them to understand the field of Industrial Engineering in real condition.

1.2 The Objective Of The Student Internship

As an engineer degree, we cannot just stop on mastering the knowledge of the technical things. Having the skills to solve any technical problem is also important, so did the industrial engineering degree. This is the reason the IE Department provides this program for students.

Through this student internship, hopefully student can recognize and identify the technical functions and get the chance to directly get involve on those functions.

Generally, the objective of this internship is to help student achieve the key competences and the support competences of the IE Curriculum. In more detail, the student internship objectives are:

1. To make the students understand the technical role as an industrial engineer
2. In order for student to have the experience or get involved in the real industry as an industrial engineer.
3. In order to train the student the communication skill and team-work skill in the real work.
4. In order for student to be able to make a good report that contains good information, though concise, communicative and systematic, this appropriates with the following activity context.
5. In order to train the student the communication and presentation skill to present their activities –orally-, whether to the internal or external supervisor.

1.3 The Stakeholders of the Student Internship

The parties involved in the KP include:

1. Students who involved in the program
2. The coordinator of student internship.
3. The administrator of student internship.
4. The Internal Supervisor, are the Industrial Engineering lecturers that already appointed by the Coordinator of Student Internship to give direction to the student during the internship.
5. External Advisor, are the employees from the company / organization where the student doing the internship program that already appointed from the company to give direction to the student during the internship.

2. THE REQUIREMENTS

2.1 General requirements

These are the general requirements that have to be fulfilled before student applies the internship program:

1. Listed as active student in Industrial Engineering - ITS

2. Has passed 80 credits at the time when apply the student internship
3. Follow the student internship procedures

2.2 Special Requirements

The following requirements must be fulfilled by students during the internship:

1. Regards the student internship program is the media for student to learn and practice about the Industrial Engineering functions, then this program is implemented in profit or non-profit organization which credible and has adequate Industrial Engineering function.
2. Accordance with the rules regarding the weight of the ITS academic subjects, then KP weighing 2 college credits field should be carried out for 2 months with 1 month of the implementation details and guidance on where KP and 1 month guardianship / directing, reporting and evaluation.
3. Student Internship held by individuals or groups with a maximum number 2 students.
4. Implementation of student internship should not interfere the student's lectures activity.
5. The Student Internship should appropriate with the Industrial Engineering functions.
6. Student Internship carried under the direction of Internal and External competent supervisors.
7. Students have to fill out the log book follow with the specified format.
8. Students should consult and report periodically to the Internal and External Supervisor.
9. Students must submit their internship mark to the Coordinator latest 2 months after the implementation of student internship.

3. THE STUDENT INTNERNSHIP PROCEDURE

The administrative service for the internship is using the Sistem Informasi Kerja Praktek (SIKP). Students who will apply for the internship, need to access the SI-KP in the Industrial Engineering websites in address www.ie.its.ac.id/kp. The procedure for applying the Internship is divided into two, namely the general procedures and other procedures.

3.1 The General Procedures for implementing the Student Internship

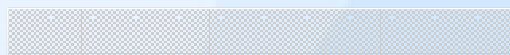
The General procedures for the student internship to be followed by students described in figure 1.

1. Students need to enroll through the SIKP, which the registration process can be done in groups or individually.
2. Upon registration, the system will verify the conformance of the student with the general requirements. If the student already met the general requirements, the student will receive a notification e-mail with information about the next steps that should be done. If they do not receive any e-mail, then the student cannot continue the procedure.
3. Upon the acceptance from the e-mail, SI-KP will automatically open up the authority for the user to print the proposal and the cover letter by previously entering the name of the desired company (maximum 2 companies).
4. Students can submit the proposals and cover letters that have been printed and legalized, which obtained from the administrator of the student internship.
5. The application process can be continued if one of the companies desired sends a reply that accepts the application. If both companies send replies for acceptance, then students should choose one of the companies through the SIKP. Companies that are not selected will be offered to other students via announcements on the front page of SI-KP. If the two companies reply rejection letters or give no respond within 2 months, then the students need to repeat the process to input company (another alternative) and submit the proposal along with the cover letter application as the previous procedure. It is the compulsory for students to monitor the response from the company through good communication with the company.
6. For students who have been accepted at the company, the Coordinator will assign lecture in the department to be the Internal Supervisor for the student. At the same time, students are required to reply the letter from the company.
7. Students need to communicate with Internal and External supervisor to get supervision and direction during the implementation of the internship.
8. Students execute the internship.
During the two months internship, student must check SIKP to keep updated about the information; fill out the log book online or manually with the format that can be downloaded at SIKP.
9. Advance monitoring (presentation and preparation of reports for the company) and the evaluation will be conducted two months before deadline of the internship.
10. External supervisor will give an assessment to the student through the Assessment Form that provided in sealed envelope and delivered directly to the administrator of the

internship. The internal supervisor gives mark through the SIKP. The final score will be processed by the administrator and the coordinator and can be viewed at SIKP.

If until the deadline of the internship there were components of the assessment that has not been accepted by the system or the administrator, then the system will automatically calculate the mark of the internship based on the initial input value. The score issued by the system are final.

START



3.2 Other Procedure

3.2.1 Internship extension procedure

Internship extension can be done by the following requirement:

1. Student has specific reasons to request extension which has been consulted first with Internal Advisor and also External Advisor
2. Student fill the extension request on SIKP page My Page before internship period is over
3. Internship extension request will be processed by internship administrator after required approval from internship coordinator and internal advisor. Approval will be sent in form of e-mail to student. As long as the e-mail reply has not been received, student can monitored his/her request by contacting internship administrator.

3.2.2 Internship Cancellation Procedure

Internship cancellation procedure is valid if general procedure of internship has pass the stage where request letter to designated company. As for the procedure of cancellation that must be followed is like so:

1. Fill in Internship-I form and attach supporting document after consulting with Internship Coordinator. Supporting document is document that can prove of acceptable resignation reason. For example a resignation that cause by student health condition which must be include with medical letter
2. Resignation can be processed after approval by Internship Coordinator

4. INTERNSHIP ASSESSMENT

Components of Internship Assessment are as follows:

1. By External Advisor
 - a. Percentage of attendance (25%)
 - b. Student Competence (25%)
 - i. Experience and involvement on industrial technic functions
 - ii. Communication and team work in workplace
2. By Internal Advisor
 - a. Activity report (25%)
 - i. Log book completeness
 - ii. Report load
 - b. Communication ability to delivers activity report to advisor (25%)

5. INDUSTRIAL ENGINEERING FUNCTION THAT CAN BE SELECTED

During the internship, the student may choose (but are not limited to) the functions of industrial engineering functions which shown in Fig. 2 of the following:

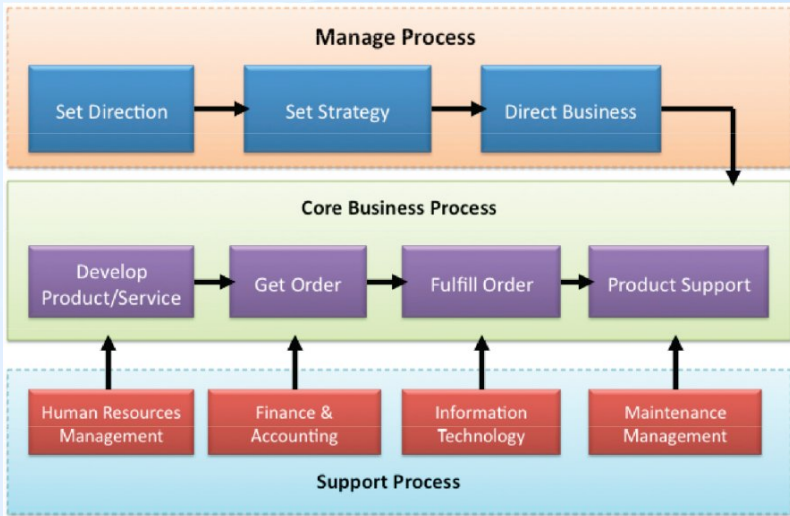


Figure 2. Business Functions

For further information, in Table. 1 shows the following group of industrial engineering functions according to business functions that may applied.

Table 1. Function of industrial engineering

| Business function | Industrial Engineer Field | The following activities according to its function |
|-------------------|---------------------------|---|
| Set Direction | Strategic Management | 5. Perform an internal and external condition analysis of the organization (SWOT) 6. Develop and arrange the vision and mission of the organization 7. Aligning the organization vision and mission with the other organization function 8. Evaluate the vision, mission, and the organization strategies. |

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| Set Strategy | Strategic Management | <ol style="list-style-type: none"> 4. Develop the organization strategies based on the vision, mission, and the SWOT analysis. 5. Comprehend the deployment process of existing strategies into company unit works. 6. Establish the strategic objectives from each work units in the organization. |
| Direct Business | Organization Management | <ol style="list-style-type: none"> 15. Designing the organization structure that equal with the company strategies. 16. Develop a good organization culture. 17. Measure the organization affectivity using the external-internal resource approach and technical approach. 18. Comprehend the contribution of the stakeholders to the company and the support of the company to the stakeholders. 19. Comprehend the organization dominant challenge in order to design an effective organization structure. 20. Identify the opportunities and the organization challenge based on the organization environment. 21. Comprehend the cause of uncertain organization environment. 22. Manage the available company resource. 23. Comprehend the organic organization structure for the management respond toward the organization challenge 24. Evaluate the organization structure whether the existing organization already comprehend with the company strategies. 25. Evaluate the technology role to the competence and the organization affectivity. 26. Describe the technical complexity (technology) to the organization characteristic. |

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| | | <p>27. Describe the changing process organization structure.</p> <p>28. Comprehend the organization transformation based on the organization life cycle.</p> |
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Table 1. Function of industrial engineering (Continued)

| Business function | Industrial Engineer Field | The following activities according to its function |
|--------------------------|--------------------------------|---|
| Direct Business | Performance management | <p>6. Design the system for performance measurement that used by the company.</p> <p>7. Define the KPI (Key Performance Indicators) that used in the performance measurement system</p> <p>8. Define the target for each KPI.</p> <p>9. Define the control mechanism to measure the performance.</p> <p>10. Perform the evaluation of organization performance</p> |
| Develop Product/ Service | Design and service development | <p>5. Define the attribute for designing the service process</p> <p>6. Design the standard performance for service process.</p> <p>7. Design the concept of service process generally.</p> <p>8. Design the service process in detail (blueprint)</p> |
| Fulfill Order | Facility planning | <p>9. Identify the facility planning problem</p> <p>10. Collecting data related with the produced part/product, include the types, quantities, processes, and the support services.</p> <p>11. Identify the area/work function (department) and the interaction between functions.</p> <p>12. Verify the data that collected from the operational function.</p> <p>13. Design the alternative layouts using the existing method.</p> <p>14. Appraise the cost, frequency, and distance parameter to define the best layout.</p> |

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| | | 15. Doing general evaluation of the existing layout. 16. Implementation of layout changing |
| | Manufacturing System | 12. Define the product type based on the manufacturing classification. 13. Identify the manufacturing processes. 14. Identify the material handling system 15. Identify the quality control system 16. Identify the raw material receipt system. 17. Identify the finished goods handling system until the goods ready to deliver. 18. Identify the manufacturing support system 19. Identify the manufacture operational parameter (availability, MTBF, etc) 20. Find the alternatives from existing manufacturing system that already identified based on the existing manufacturing system reference. 21. Evaluate all the alternatives system manufacture design. 22. Define the best manufacturing system design alternatives. |

Table 1. Function of industrial engineering (Continued)

| Business function | Industrial Engineer Field | The following activities according to its function |
|-------------------|---------------------------------|--|
| Fulfill Order | Production Planning and control | 1. Analyze the sales data 2. Use the sales data to forecast the need of material. 3. Develop a bill of material (BOM) 4. Collect and analyze the lead time data. 5. Classify the product based on the attribute. 6. Make the production planning. 7. Plan the method to develop the need of material. 8. Establish the policy of material supply availability. 9. Develop work schedule. |

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| | | <ul style="list-style-type: none"> 10. Production process control. 11. Using software related with the production planning and inventory control software (e.g. ERP) 12. Contribute to the planning meeting. |
| | Quality control | <ul style="list-style-type: none"> 1. Define the quality characteristic to related product. 2. Define the appropriate method for quality control. 3. Define the measurement instrument or criteria for the product quality. 4. Develop the procedure for quality control. 5. Develop the sheet for quality control. 6. Coordinate the quality control activities. 7. Start the quality control process. 8. Collect the data from the control process. 9. Analyze the quality and make interpretation from the data. 10. Communicate the quality interpretation. 11. Discuss the related factors to define quality 12. Discuss and decide the appropriate action that needed in quality matter 13. Design and make the plan 14. Execute the decision and evaluate the affectivity. |
| | Time and motion study | <ul style="list-style-type: none"> 1. Defining the related process in workstation 2. Mapping the details of work process appropriate with work need. 3. Analyze the economic movement. 4. Determine the time and motion study method which appropriate with the work-type (direct or non-direct activities). 5. Determine the object for time and motion study analysis. 6. Prepare the tools for analyzing the time and motion study. 7. Determine the performance dan allowance (time) |

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| | | 8. Define the standard time 9. Analyze, evaluate the work method 10. Design the repairmen for the work method |
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Table 1. Function of industrial engineering (Continued)

| Business function | Industrial Engineer Field | The following activities according to its function |
|-------------------|---|---|
| Fulfill Order | Supply chain management | 1. Observe the existing product variation 2. Define the product based on the variation, life cycle, etc. 3. Evaluate the factor that effect the sales 4. Analyze the possibilities of bullwhip effect 5. Analyze the target of service level for each customer 6. Measure the performance of service level for each product and customer. 7. Analyze the supplier performance. 8. Design the mechanism to measure the supplier performance. 9. Evaluate the product distribution flow. 10. Involve the using of SCM software |
| Fulfill Order | Maintenance and Reliability Engineering | 1. Find data of production specification and function of facility/machine and the relationship between machines/facilities in supporting company's operation 2. Collect the data of breakdown and repairing for every production machines/facilities 3. Put in inventory every problems related to production machines/facilities 4. Put in inventory efforts that have been done related to production machines/facilities maintenance 5. Determine service level for every production machines/facilities 6. Analyze the data of breakdown and determine the reliability function for every production |

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| | | <p>machines/facilities</p> <ol style="list-style-type: none"> Calculate the Mean-Time-To-Failure (MTTF) or Mean-Time-Between-Failure (MTBF) for every production machines/facilities Discuss and set maintenance strategy in line with company's vision and mission to reach service level target Make maintenance planning for every production machines/facilities Determine Key Performance Indicators (KPIs) of maintenance activities Implement the maintenance planning Measure the KPIs maintenance activities accomplishment Evaluate the maintenance activities effectiveness Design system of maintenance activities procedure Design Computer Maintenance Management System (CMMS) |
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Table 1. Function of industrial engineering (Continued)

| Business function | Industrial Engineer Field | The following activities according to its function |
|-------------------|-------------------------------------|--|
| Fulfill Order | Service process | <ol style="list-style-type: none"> Implement the service process design <ul style="list-style-type: none"> Service production planning Service environment setting Service delivery Service production process Measure service process performance Assess customers satisfaction on the service process Improve service process performance |
| Product Support | Reliability and Warranty Management | <ol style="list-style-type: none"> Collect data of broken down/maintenance product (from Maintenance Dept. and/or After Sales Service Dept.) Put in inventory guaranty policies for every product |

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| | | <p>line and types of customer</p> <ol style="list-style-type: none"> 3. Evaluate guaranty management effectiveness all this time 4. Evaluate customer satisfaction on product guaranty policy 5. Determine after sales product management KPI technically (reliability) and economically (guaranty management and policy) 6. Analyze every types of product reliability, burn in period, and products drawback 7. Analyze and determine guaranty policy that fit with the reliability of every types of product 8. Design the Procedure Operational Standard of guaranty management 9. Design computerized management system and guaranty management |
| Product Support | Customer Relationship Management (CRM) | <ol style="list-style-type: none"> 1. Map out the relationship between CRM with the whole business process 2. Understand the efforts which have been done to build relationship with the customers 3. Measure the effectiveness of the efforts in supporting the accomplishment of company's vision and mission 4. Determine KPI related with the relationship between company and customer 5. Design effective and efficient CRM efforts 6. Implement CRM efforts which have been designed 7. Measure the accomplishment of CRM efforts which have been implemented |

Table 1. Function of industrial engineering (Continued)

| Business function | Industrial Engineer Field | The following activities according to its function |
|----------------------------|---------------------------|--|
| Human Resources Management | Human resource management | <ol style="list-style-type: none"> 1. Understand the role of HR in the support process 2. Design the role of HR to be fit with the company's strategy 3. Design HR to be fit with the organization's structure 4. Describe the role information technology in the HR management 5. Estimate the need of HR (man power planning) 6. Design the hiring of HR (recruitment and selection) 7. Analyze training need (Training Need Analysis) 8. Design career system 9. Design reward and punishment system 10. Design performance assessment system 11. Describe the performance assessment process 12. Design the competence model 13. Describe the build-up process of organization learning |
| Finance & Accounting | Accounting analysis | <ol style="list-style-type: none"> 1. Identify cost object 2. Identify cost behavior 3. Analyze budgeting method 4. Analyze set up method of Cost of Goods Sold 5. Analyze cost per unit 6. Design budgeting 7. Design simple finance report 8. Analyze finance performance |

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| Information Technology | Information system management | <ol style="list-style-type: none"> 1. Determine system which will be repaired 2. Determine related entity 3. Map up business process in detail 4. Determine data flow in observed business process 5. Evaluate and improve observed business process (simplification, eliminate unnecessary process, etc.) 6. Create Data Flow Diagram 7. Create Entity Relationship Diagram 8. Design database (normalization) 9. Design information system (software) |
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Table 1. Function of industrial engineering (Continued)

| Business function | Industrial Engineer Field | The following activities according to its function |
|------------------------|---|---|
| Maintenance Management | Maintenance and Reliability Engineering | <ol style="list-style-type: none"> 1. Find data of production specification and function of facility/machine and the relationship between machines/facilities in supporting company's operation 2. Collect the data of breakdown and repairing for every production machines/facilities 3. Put in inventory every problems related to production machines/facilities 4. Put in inventory efforts that have been done related to production machines/facilities maintenance 5. Determine service level for every production machines/facilities 6. Analyze the data of breakdown and determine the reliability function for every production machines/facilities 7. Calculate the Mean-Time-To-Failure (MTTF) or Mean-Time-Between-Failure (MTBF) for every production machines/facilities 8. Discuss and set maintenance strategy in line with company's vision and mission to reach service level target |

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| | | <ol style="list-style-type: none"> 9. Make maintenance planning for every production machines/facilities 10. Determine Key Performance Indicators (KPIs) of maintenance activities 11. Implement the maintenance planning 12. Measure the KPIs maintenance activities accomplishment 13. Evaluate the maintenance activities effectiveness 14. Design system of maintenance activities procedure 15. Design Computer Maintenance Management System (CMMS) |
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Table 1. Function of industrial engineering (Continued)

| Business function | Industrial Engineer Field | The following activities according to its function |
|-------------------|------------------------------|---|
| Supporting Tools | Analysis and decision making | <ol style="list-style-type: none"> 1. Identify decision problem 2. Define objectives from decision problem 3. Identify decision alternatives 4. Identify possible events to happen 5. Define outcome/measurement tool of decision making 6. To model the decision (decision tree, influence diagram, etc.) 7. Define uncertainty in decision making (probability concepts) 8. Combine uncertainty in decision model 9. Collect relevant data and information 10. Make decision making technique 11. Do analysis technique on decision (sensitivity, risk, etc.) 12. Analyze preference factor from decision making 13. To model reference of decision making |

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| | Project management | <ol style="list-style-type: none"> 1. Project planning 2. Design Work Breakdown Structure (WBS) 3. Estimate project cost 4. Project control 5. Project scheduling 6. Project risk analysis 7. Resource allocation on project (leveling) 8. Set up project organization 9. Project scheduling with limited resources |
| Supporting Tools | Operational research | <ol style="list-style-type: none"> 1. Production scheduling 2. Workforce planning 3. Routing process/resource scheduling 4. Optimize production planning 5. Determine shortest route (distribution and logistic) 6. Determine machine reliability |

6. INTERNSHIP REPORT

6.1 Format and Content of Internship Report

Internship report is made by the following format:

1. Cover
2. Attestation sheet
3. Preface
4. List of content
5. List of figure
6. List of table
7. Chapter I: PREFACE

The content of Preface Chapter is adjusted with condition/ assignment from company and consist of:

- Background of the needs of internship
- Purpose and benefit of internship

- Limitation and assumption (if necessary)
 - Writing systematic
8. Chapter II: GENERAL OVERVIEW OF COMPANY
Elucidates anything that related with the company, including: type of business, history of company, organization structure, and other related information
 9. Chapter III: DAILY ACTIVITIES REPORT
This chapter elucidates student's daily activities during internship. Also mentioned in this chapter are date of activities, other parties that are involved during activities, daily activities in detail, etc.
 10. Chapter IV: ANALYSIS AND INTERPRETATION
This chapter contains description of:
 - Understanding / insight that are obtained from each activities (activities, understanding/insight obtained, benefit, advantage, disadvantage, recommendation) that are insight from internship
 - Analysis and interpretation from all activities compare with theory that received during classes
 11. Chapter V
This chapter accommodate assignment that given from company, if given. It is not mandatory to be attached, however if it is attached then the title matches with the assignment given from company.
 12. Chapter VI CONCLUSION AND RECOMMENDATION
 13. REFERENCES
 14. APPENDIX
 - Form D (log book)
 - Supporting data

6.2 Internship Report Submission

Internship report is made three copies and addressed to:

1. Company of internship
2. Ruang Baca Jurusan Teknik Industri (RBTI)
3. Internal advisor