

**ITU Faculty of Textile Technologies and Design
Department of Textile Engineering**

Internship Fundamentals

1. Students are obliged to comply with the **ITU General Internship Principles** during their factory internships.
2. Students are obliged to carry out all the administrative documents related to the internship (internship registration, insurance, contract, etc.) as explained in the **ITU General Internship Principles**.
3. Textile Engineering Department students are required to do 4 groups of internships for a total of 45 days:
 - Internship 1 - 10 working days - Yarn
 - Internship 2 - 10 working days - Weaving or Knitting (Students can complete their internship in any of the fields of Knitting or Weaving according to their preferences.)
 - Internship 3 - 10 working days – Clothing_Planning
 - Internship 4 - 15 working days - Dyeing_Finishing_Laboratory
4. To be able to graduate, students must complete a total of at least 45 days of compulsory internship.
5. The format and writing of the internship reports must be as specified in the **ITU General Internship Principles**.
6. In internships, the condition of having completed a minimum of 35 credits is required, regardless of whether the relevant courses have been taken or not.
7. All internships can be done during the summer and semester.
8. The compulsory internship period can be at least 10 and at most 30 working days each time, provided that the desired internship areas are provided. Internships can be done at least 3 and at most 6 days a week within the internship work schedule.
9. During the application, the student must declare the days of the internship with the student internship work calendar. Half-day internships cannot be done. All procedures regarding the duration and date of the internship and insurance are carried out only by the Career and Internship Center.
10. Students can be absent for a maximum of 10% of their internship days. Internships cannot be done on exam and class days, including DAN coded courses and midterm/final presentation days of graduation projects. Internship workdays should not coincide with official holidays or religious holidays. However, if it can be documented that the workplace is open on official holidays, it is possible to do internships on the that days.

11. Within the scope of the Industry/Sector Focused Undergraduate-Graduate Program, long-term internships of undergraduate and graduate students are considered as compulsory internships. A protocol is made between the Rectorate and the Industry/Sector Organization for these internships. For internships to be carried out in these organizations, a contract is prepared for each student by the relevant department internship committee and faculty director for undergraduate students, and by Graduate School for graduate students. The contracts regarding the internships of graduate students are approved by Graduate School after the proposal of the relevant department.
12. Work experience internships, which can be done from the end of the 2nd year onwards for a period of 6 weeks minimum, can be done if the Rectorate approves it after taking the opinions of the Department Internship Committee, Central Internship Office and Legal Office.
13. Internship application, insurance and other administrative procedures will be carried out by the Central Internship Unit as of 01.07.2017.
14. Students can do long-term internships at institutions that have signed a cooperation agreement with our university. In order for students to do long-term internships, the work they will do must be of a nature that will provide experience in a profession related to the program the student is studying. The following provisions are taken into consideration for long-term internships:
 - i) Long-term internships can be done at the end of the second year, for a minimum of forty-five working days, and can continue throughout the entire education period.
 - ii) If a student who does a long-term internship fulfills the requirements of the compulsory internships and submits an internship report; he/she may be exempted from the compulsory internship at the discretion of the Department Internship Committee.
 - iii) The entire process regarding the application, start, continuation and completion of long-term internships is carried out by the Career and Internship Center, in accordance with the provisions of the agreement between the University and the Institution.
15. Since Erasmus or voluntary internships abroad cannot be insured by our university, these internships will not be recorded in the portal system. If it is requested to be counted as compulsory internships, the student can apply to the faculty with the internship acceptance document and employment contracts that include the internship dates, a document showing that the student has insurance, a photocopy of the passport and the internship report, and approval from the internship committee.
16. If the work to be done is of a nature that will increase the student's practical experience in the program he/she is studying, the student may do a voluntary internship. The following provisions are taken into consideration for voluntary internship:
 - i) Voluntary internship can be done for a minimum of 10 and a maximum of 50 working days at once or in divided parts. A student has the right to do a voluntary internship for a maximum of 50 working days during the entire education period.

- ii) Students cannot receive approval for their voluntary internships before completing their compulsory internships. Voluntary internships do not replace compulsory internships.
 - iii) Voluntary internship applications are made through the Portal at the latest fifteen days before the internship start date. The documents related to the internship application are evaluated by the departmental internship committees.
 - iv) Students who are currently working as insured in a job cannot do a volunteer internship during the periods corresponding to the same period.
 - v) During the voluntary internship, the University covers the work accident and occupational disease insurance premiums in accordance with the provision of Article 5, paragraph (b) of Law No. 5510.
 - vi) An internship report is requested for voluntary internships.
 - vii) A student who does not complete his/her internship without a valid excuse after the voluntary internship has started is deemed to have used his/her voluntary internship right until the day the insurance record is opened and approved.
 - viii) General provisions apply to other issues.
17. Internships done by Vocational High School graduate students during their high school education cannot be counted as a substitute for any internship in undergraduate education.
18. The student must actually continue the internship. The days that the student does not attend the internship cannot exceed 10% of the total internship period. In the event that the absence is one of the cases listed in the ITU Acceptance of Excuses and Making Excuse Exams Principles, the decision on the part of the internship that will be considered valid belongs to the department internship committees.
19. The previous internships of Double Major Program students that were accepted in their previous departments may be accepted instead of one of the internships done in the second department, provided that the content is suitable and the requested additional documents are provided.

UOLP Programs

In the UOLP Programs of the Faculty of Textile Technologies and Design, compulsory internship can be done at least 1 day a week, depending on the curriculum of the relevant program.

Note: The İ.T.Ü. Textile Engineering Department Internship Principles written above are valid for students who enrolled in or later than academic year 2017-18.

ITU Faculty of Textile Technologies and Design

Textile Engineering Department

Internship Contents

- Internship 1 - 10 working days Yarn
- Internship 2 - 10 working days Weaving or Knitting (Students can complete their internship in any of the fields of Knitting or Weaving, according to their preferences).
- Internship 3 - 10 working days Clothing-Planning
- Internship 4 - 15 working days Dyeing-Finishing-Laboratory

INTERNSHIP 1:

YARN INTERNSHIP (10 working days)

Yarn internship can be done in a company operating in one of the fields of cotton, wool or synthetic fiber spinning. Information about the followings is expected to be obtained during the internship:

1. How is the organizational structure of the company?
2. How many engineers and workers are working in the spinning mill? How many machines are operated by one worker?
3. What is the raw material processed in the company?
4. How many washing (for wool spinning), blowroom, carding, combing, draw frame/drawing, roving/finisher, spinning machines does the company have?
5. What are the basic working principles? Data of efficiency, production quantities of the existing machines and total production of the spinning mill.
6. For each machine, input material count and output material count.
7. What are the settings of the machines? For example, how many folds and how many shots are made in draw frames? How much draft and twist are imparted at the roving frame? What are the spindle speed, amount of twist and amount of draft in the ring spinning machine?
8. What are the properties, usage area and quality values of the end products?
9. Is there any bottleneck in the mill? If so, where is it and what is being done to solve it?
10. What measures are taken to ensure and maintain quality?
11. How often and how are the machines maintained?

In case of internship in synthetic filament spinning or textured yarn production:

1. How is the organizational structure of the company?
2. How many engineers and workers are working in the spinning mill? How many machines are operated by one worker?
3. What are the chemical and physical properties of the raw material (polymer) used?
4. Is there polymerization/polycondensation in the filament yarn production facility? If yes, how are these processes carried out?
5. What are the features of the parts of the filament production line (extruder, production column, nozzle package, nozzle cooling cabinet, godets and winder)? What are the features of the machine used in the texturing process?
6. Layout of the filament/texturing production hall and production flow chart
7. What are the production parameters for filament yarn production/textured yarn and what are the effects of these parameters on the filament/textured yarn properties?

8. What are the physical and chemical tests used to determine the properties of the produced filament/textured yarn?
9. What are the importance and properties of ambient air conditioning in LOY/POY production in filament yarn production?
10. What are the importance and properties of conditioning after LOY/POY production in filament yarn production?
11. In filament yarn production, what is the relationship between the drawing process (drawing-twisting/drawing-winding) machine and the process parameters and yarn properties? What is the importance of the fiber finishing agent (spin finish) in synthetic fiber production? What types of finishing agents are used?
12. What are the usage areas of the produced filament/textured yarn?
13. Is there any bottleneck in the mill? If so, where is it and what is being done to solve it?
14. What measures are taken to ensure and maintain quality?
15. How often and how are the machines maintained?
16. How much are the efficiencies and production rates of the machines?

Samples that can be taken during the yarn internship: Photos of fiber, strip, roving, yarn, traveler, etc. can be included in the Report.

INTERNSHIP 2:

WEAVING OR KNITTING INTERNSHIP (10 working days)

WEAVING INTERNSHIP

Weaving Preparation

Organization of the preparation room, machine park, number of personnel, number of workers.

A- Creel Machine:

1. Machine brand, number of workers, number of heads, working speed, efficiency, daily production,
2. Cross winding and precision winding processes
3. Bobbin shapes and bobbin specifications
4. Thread brakes
5. Thread cleaners, and especially electronic cleaners, programming the cleaning arrangements, size of bugs cleared off
6. Yarn splicing systems and especially knot and splicer (pneumatic or mechanical)
7. Bobbin length measurement systems, bobbin hardness, diameter settings
8. Paraffining process: Types, properties, consumption amounts, number and hardness of paraffin

B- Direct Warping Machine:

1. Machine brand, number of workers, working principle, machine width, raw beam width, diameter, maximum beam length, winding speed according to various yarn counts and number of strands
2. Creel specifications, capacity, yarn brake systems, bobbin change systems
3. Winding system and cross comb settings
4. Machine speed, efficiency information and calculations, time for creel change, time for fixing breakage, daily production
5. Causes of yarn breaks and million meter break study

6. Examining warp calculations and work orders for a type (ÇTS (Total Number of Warp Ends)), raw beam number, number of raw beam ends, warp length, amount of yarn remaining in the bobbin, various warp calculation examples)

C- Sectional Warping Machine

1. Machine brand, number of workers, working principles of the machine, conical width, conical angle, working speed, efficiency, daily production,
2. Creel features, capacity, yarn brake systems, bobbin change systems
3. Conical warp calculations for one type (creel color sequences, number of tapes, number of yarn ends in a tape, tape width, conicity or speed, reed number and transition etc.). Example calculations of various types worked on the machine.
4. Parameters entered into the conical warping machine
5. Investigating conical winding and transfer, their speed, number of breaks

D- Sizing Machine

1. Examining the working principle of the machine, working speed, daily production
2. Sizing agents and auxiliaries
3. Sizing recipes and sizing preparation (cooking pot, cooking conditions, temperature, viscosity, the refractometer)
4. Machine process settings (regional tensions, size pressure settings, setting temperature of drying cylinders, elongation, humidity, beam pressure etc.)
5. Investigating sizing intake ratio, size ratio, increase in strength

E- Draft and Knot

1. The knotter and knotting systems, machine speed, knot time.
2. What is drawing-in? Examining the drawing-in process. Examining automatic drawing-in machine if there is one, including its production rate etc.
3. Examining weave pattern, denting and drawing-in-draft

Weaving

1. Organization of the weaving hall, machine types, widths, number of machines, number of weavers and other staff, weaver beam diameter, length of warp wound
2. Examining the general working principles of the machines, their angular velocity, efficiency, number of breakages, number of wefts per day, production rate (m/day), reasons for breakage. Learning how to enter parameters from the panel, programming weft density and weave pattern, entering weft color report etc.
3. Warp let-off systems
4. Examining eccentric, dobbie and jacquard systems. Examining weft insertion systems
5. Examining fabric take-up systems, warp control and weft control systems
6. Weft accumulators and their properties
7. Temple rods and their properties
8. Motor and clutch, sumo motor, direct drive motor, beat-up and beat-up motion systems
9. Drop-wire, heald and reed and their properties,
10. Investigating weaving breakage (statistical data in terms of number of breakages per shift and number of breakages per 100000 wefts), number of warp breakages, number of weft breakages, breakage places, breakage reasons
11. Calculations regarding number of looms per weaver according to breakage data
12. Edge leno weaves and edge curlers
13. Post-weaving fabric inspection, major fabric types manufactured by the company and their process parameters (weaving patterns, number of total warp ends, warp density, weft

density, areal density yarn counts, shrinkages, reed widths, reed numbers and transitions, fabric defects, scores of errors, quality evaluations, ratio of first quality fabric, ratio of second quality fabric)

14. Tracking weaving efficiency, machine efficiency, hall efficiency and, if any, investigating loom-data

KNITTING INTERNSHIP

Knitting internship can be done in a company of circular, flat or warp knitting.

1. How is the organizational structure of the company?
2. How many engineers and workers work in the knitting department? How many machines does one worker operate?
3. What are the types and numbers of machines in the company? What are the main differences between these machines?
4. Which parameters are taken into account in setting the angular speed of a given machine and how is the setting done?
5. Maintenance frequency, maintenance procedure and special points that need to be taken into consideration in machine maintenance.
6. What types of products are produced in the company?
7. Raw materials used in the company.
8. What should be the range of yarn counts to be used in machines with certain fineness, and what is the average weight of the knitted fabrics produced by using these yarns and machines?
9. Examining technical features of knitting machines
 - Diameter/width
 - Fineness,
 - Mechanical and electronic features
 - Single or double plate? Production methods, differences in production methods, factors affecting fabric properties
10. Feeding units
 - Number of feeding units of a machine with a certain diameter and fineness
 - How can you tell if the feeding unit is positive or negative? What types of fabrics are produced by using these types of feeding units?
 - When producing elastane fabric, how is elastane fed and what important points should be taken into consideration regarding feeding?
 - How is the operating velocity of the feeding units determined?
11. Investigating knitting elements
 - Needle-How many needles does a machine with a certain diameter and fineness have? How many types of needles are there and what are the features that make the needles different from each other? How does needle butts determine fabric pattern?
 - What is the basic function of sinker?
12. Examining the patterning systems - How should the cams be placed for producing a fabric with a certain pattern? How does electronic pattern work? Explain by examples.
13. How does the winding mechanism of the knitting machine work? What are the major points that are needed to be taken into consideration in setting winding speed? How is fabric tension tuned?
14. What are the general characteristics of the manufactured products? What are the causes of errors and how can they be prevented? Explain with examples.
15. Production calculations - How much is production rate per day per machine in kilogram for

a certain yarn count? How much is the overall efficiency of the company and how much is the total daily production?

Note. Samples that can be taken at the knitting internship: Photographs of needles, sinker, fabrics with defect, fabrics with different patterns, etc. can be included in the Internship Report.

INTERNSHIP 3:

APPAREL-PLANNING (10 working days)

1. Organization: General information about the company, organizational structure, administrative and technical work chart, the schema of the division of labor and hierarchical structure. If there is no chart of the organizational structure already available in the company, one is needed to be drawn.
2. Planning: Making and examining the production plan for manufacturing various types of products. Preparing production plans for at least 3 different products manufactured in the enterprise. Getting information about calculating amount of fabric required for the given models to be manufactured, cost calculations, stock control, production control and planning, job description and organization of workshops, product types, daily production amount of the factory, the fabric used, the accessories and auxiliary materials and their controls, the machine park and production lines, quality control.
3. Examining how the work-time study is done and the results obtained. Gaining general information about the daily production, productivity and efficiency of the factory, the features of the products produced, the raw materials used, the machine park and the number of employees. Gaining information about the quality control systems used.
4. Garment design, pattern making: Examining garment design process, pattern making and pattern grading. Examining computer programs for garment design.
5. Graph preparation and cutting: Examining graphic preparation methods, obtaining information about marker laying and marker efficiency. Investigating cutting process, cutting motors, matching and labeling processes, material transfer methods between cutting room and sewing room.
6. Sewing: Investigating sewing machines in the sewing hall and the work they do. Pictures and/or drawings of the sewing machines must be included in the internship report. Examining the existing production lines in the factory and examining the types and numbers of sewing machines on the line according to the products they produce. Observing which type of material is processed on which machine. Investigating production rates and efficiencies of the machines, their settings and angular velocity. Investigating sewing threads and needles used. Getting samples of sewing needles, stitches that were sewn by them on fabric, zippers, buttons, etc.
7. Pressing, quality control and packaging: Giving information about the irons and presses used in the company. Investigating their working principles, quality control methods used, inspection and packaging processes.

INTERNSHIP 4:

DYING-FINISHING-LABORATORY INTERNSHIP (15 Working Days)

A- Company Profile and organizational structure of the company

1. Legal entity and full address (Telephone, Fax, etc.), legal form (Organization, A.Ş., Ltd., etc.), brief history, map or sketch showing its location
2. Organization chart

3. Personnel structure, number of administrative and technical personnel, breakdown of degrees/diplomas of the personnel
4. Production capacity of the company (daily and annual capacity in m., kg. and TL)

B- Use of water in the

1. Source of water supplied to the facility (well water/transported, daily water consumption)
2. Pre-treatment of water (to be detailed schematically)
3. Steam production and use in the company

C- Laboratory

1. General information about devices in the laboratory, their functions, climatic conditions, objectives of the laboratory tests, examination methods and methods of evaluation of examination results. Examining the test results in the laboratory, obtaining information about the accept-reject conditions according to the standards.
2. In finishing processes (pre-treatment, coloring, and finishing), gathering informations regarding process water, finishing bath, process stages of semi-finished and final products, lab devices for quality control (names, brands, details of their use and related TSE, ISO, DIN etc.. standards)
3. Spectrophotometric measurements, if any.
4. Laboratory dyeing machines, frequency of their use
5. Relations between the laboratory and production hall

D- Finishing machines

1. Identifying existing finishing machines (Pre-treatment, coloring (dyeing and printing), washing, drying, mechanical/chemical finishing etc)
2. Gathering information about types, numbers, names, brands and uses of the existing machines
3. Investigating auxiliary units in machines such as pumps, valves, bath control and dosing units and automatic control units
4. Capacities of the machines and frequency of their use
5. Layout of machines
6. Goods transfer systems in the finishing department (forklift, rail system, etc.)
7. Utilities (electricity, lighting, air conditioning, etc.)
8. Safety measures and their implementation
9. Maintenance repair workshop and maintenance periods

E- Textile materials and chemicals

1. The properties and blends of the textile materials used (cotton, polyester, wool, cotton/polyester, wool/acrylic, etc. other blends)
2. The form of the textile material (yarn, fabric (knitted, woven, non-woven etc.), their origin, domestic to import ratio)
3. Tests before finishing operations
4. Pretreatment chemicals, dyestuff, finishing and auxiliary chemicals: Their names, manufacturer, daily and annual consumptions in kg.
5. Storage system
6. Stocking system

F- Finishing operations

1. Classification of finishing processes applied

2. Based on the textile material used and starting from the pre-treatment processes, determining recipes according to liquor ratios
3. Determining the machine to be used
4. Drawing work flow diagrams
5. Determining working conditions (time, temperature, pressure, pH, liquor ratio, etc.)
6. Process control, interim product control and quality control
7. For all treatments, treated and untreated textile samples are to be included in the internship report
8. Solution methods in the case of faulty operation
9. Investigating the subsequent processes (dyeing, printing, washing, drying, mechanical/chemical treatments) in the same way as described in the previous eight bullets and, hence, completing overall finishing work flow in the entire finishing department
10. Choosing which dyeing machine line is suitable for which type of material to be dyed, giving sample recipes for the processes, examining problems and suggestions for solutions
11. Washing and rinsing: Washing mechanism, washing agents, machines used and washing efficiency
12. Drying: Working principle of the machines and equipment used, drying capacities and the points that are needed to be taken into consideration in choosing the drying system
13. Printing: Screen preparation, paste preparation (with sample recipe), printing machines, post-press drying and fixation methods, washing and post-processing after printing and their efficiency
14. Mechanical finishing processes: Investigating raising, sueding and shearing, calender, etc. along with the working principles of the machines and investigating the properties they impart to the textile material treated.
15. Chemical finishing processes: Anti-pilling, anti-static, water repellency, waterproofing, dirt repellency, flame retardancy, etc. Investigating the relevant tests and test standards
16. Investigating the efforts related to ecological production and re-use of process water

G- Waste water

1. Waste water control and treatment activities and waste water analyses conducted in-house or outsourced.
2. Wastewater treatment plant, its plan and working principle if there is one.
3. Waste water capacity (tons/day)
4. Examining where and how the waste water is discharged

Important Points Regarding Internships

1. When students enter their internship information into the Internship Registration System, they must enter their registration separately for each internship, even if the company is the same.

Example: In the Internship type field; There should be 4 internship records in total by entering as Spinning, Weaving / Knitting, Garment-Planning, Dyeing-Finishing-Laboratory.

2. Students can arrange an internship place for themselves individually or apply to the Faculty for internship placement.
3. The student who requests internship placement from the faculty applies to the faculty via e-mail after company quota is announced in the web page. Students will be placed in the company quota available in the order of their application time. The application period

covers the internships that will be held in the summer term, and the relevant announcement will be made to the students by the Dean's Office during the term.

4. Students who find an internship through their own means must confirm to tekstilstaj@itu.edu.tr whether the company they have chosen is suitable for their internship.
5. Internship Reports by the students will contain the information that they learnt and obtained from the company rather than encyclopedic information. The machine park of the company where the internship is held and the information the Report must be consistent. The internship will be invalid if a machine or process written in the Report does not exist in reality but it is included in the Report just because the internship program requires to do so.
6. Erasmus students will be able to do their internship until the beginning of the education period in the place they go as they have taken permission from their faculties for a semester.
7. Internship documents must be uploaded to Portal and Ninova as specified in the ITU General Internship Principles.
8. The internship results of the students who have not completed their Internship Report within the make-up period will not be entered into the system.
9. The placement requests of students who have not written their names on the list within the specified period for the company quotas will not be accepted.
10. Any written petition or request for canceling will not be accepted if the the student who could not have been placed in any company or a company of their choice at the time period of their choice applies after the cancellation period since the placements are limited by the quota.
11. In the event that the applied or started internship is not made or left incomplete without notice explaining the reason, the necessary actions will be taken against the student in accordance with the Higher Education Institutions Student Disciplinary Regulation.
12. Students who will arrange their own internships must obtain approval from tekstilstaj@itu.edu.tr regarding the compliance of the internships in the companies they will be doing their internship with the "internship principles and contents".
13. Since all announcements about internships will take place in the faculty web, <http://tekstil.itu.edu.tr/egitim/lisans-egitimi/staj-islemleri>, please follow the announcements on our website about internships.
14. Internship reports must be submitted within a maximum of one month from the start date of the academic year for summer internships, and within 15 days following the end of the internship for mid-term internships. Failure to comply with these deadlines is grounds for rejection of the internship and internship report.