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SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

PLANNING AND ORGANIZATION OF THE COMPANY'S ACTIVITIES

Guidelines for writing a course work

for Bachelor's (first) degree higher education students of speciality 073 "Management" of the educational program "Logistics"

Kharkiv
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Guidelines for writing a course work in the process of studying the academic discipline are presented to contribute to consolidation of students' theoretical knowledge and acquisition of skills in the field of planning and organization of enterprise activity.

For Bachelor's (first) degree higher education students of speciality 073 "Management" of the educational program "Logistics".

UDC 005.5(072.034)

Introduction

The academic discipline "Planning and Organization of the Company's activities" refers to the regulatory disciplines of bachelor's training in speciality 073 "Management" of the educational program "Logistics". The purpose of the course work is formation of planning skills and development of operational strategy, creation and use of operational systems as a basis for ensuring the achievement of the organization's mission.

The importance of the issues considered during the coursework is the need for knowledge of the basic principles, methods and essence of effective planning and organization of the enterprise's activities and the acquisition of operational management skills for the profitability and competitiveness of the enterprise (organization).

Completion of the course work will allow students to form the following professional competences of the future specialist:

the ability to manage the operating system and operational planning of the activity of the enterprise;

the ability to initiate the development of operational plans for the functioning of the operating system;

the ability to provide analytical and information support for management decision making;

the ability to initiate continuity of education, professional development and improvement of professional activity.

According to these competences, students should have the following skills:

to coordinate the activities of the operating system by setting goals and developing means of achieving them;

to develop measures to reduce the duration of the production cycle;

to organize the implementation of operational plans of the enterprise;

to calculate calendar and planning standards for each type of production;

to process primary information that is needed for making management decisions;

to identify deviations during production, develop measures to eliminate them.

Table 1 shows the competences and learning outcomes according to the educational components.

Table 1

Learning outcomes and competences formed according to the educational component

Learning outcomes	Competences that must be mastered by a student of higher education
LO3	GC4, GC5, SC4, SC5, SC7, SC10
LO4	GC12
LO6	SC10
LO7	SC1, SC2
LO8	SC5, SC7
LO9	SC8
LO10	GC11, SC4
LO11	GC3, GC8, SC11
LO17	GC3, GC10, GC11

The designations of learning outcomes and competences mean the following:

LO3. Ability to demonstrate knowledge of theories, methods and functions of management, modern concepts of leadership.

LO4. Ability to demonstrate skills in identifying problems and justifying management decisions.

LO6. Ability to demonstrate the skills in searching, collecting and analyzing information, calculating indicators to substantiate management decisions.

LO7. Ability to demonstrate organizational design skills.

LO8. Ability apply management methods to ensure the effectiveness of the organization's activities.

LO9. Ability to demonstrate the skills in interaction, leadership, teamwork.

LO10. Having the skills to justify effective tools for motivating the organization's personnel.

LO11. Ability to demonstrate skills in situation analysis and communication in various areas of the organization.

LO17. Ability to conduct research individually and/or in a group under the guidance of a leader.

GC3. Ability to think abstractly, analyse, synthesise.

GC4. Ability to apply knowledge in practical situations.

GC5. Knowledge and understanding of the subject area and understanding of professional activity.

GC8. Skills in using information and communication technologies.

GC10. Ability to conduct research at an appropriate level.

GC11. Ability to adapt and act in a new situation.

GC12. Ability to generate new ideas (creativity).

SC1. Ability to identify and describe organizational characteristics.

SC2. Ability to analyze the results of the organization's activities, to compare them with the factors influencing the external and internal environment.

SC4. Ability to determine the functional areas of the organization and the connections between them.

SC5. Ability to manage the organization and its divisions through the implementation of management functions.

SC7. Ability to choose and use modern management tools.

SC8. Ability to plan the activities of the organization and manage time.

SC10. Ability to evaluate the work performed, ensure their quality and motivate the organization's personnel.

SC11. Ability to create and organize effective communications in the management process.

The purpose and content of the course work

Completion of the course work "Planning and Organization of the Company's Activities" is a form of independent work of students, which fosters mastering professional competences, consolidating theoretical knowledge and acquiring the necessary skills to create an operational system of an enterprise and its operational management. The purpose of the course work is to plan activities and design the operating system of a small enterprise, oriented towards production. To do this, it is planned to perform a set of calculations regarding the selection of the type of the operating system, the development of its processing and supply subsystems, the organization of operational management in the system, and the evaluation of the effectiveness of the designed system. The course work includes three sections:

operating system design;

organization of operative management of the operating system;

the main technical and economic indicators of the operating system.

The guidelines for writing a course work

The initial data

The initial data of the coursework are conditional. They roughly reflect the ratio of the actual levels of organization, management and economy of production at the enterprise. The student can replace the proposed rules, standards, and prices with those in force in the company where he works (used to work). But the replacement must be comprehensive, otherwise disproportions may arise in the project. Below are the initial data for the variants of the task, as well as a list of standards that are common to all variants.

The nomenclature of products manufactured at the enterprise is given in Table 2. For each option, five products are produced, which are marked "X" in the table.

Table 2

The nomenclature of products

Product	Task options																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Product 1	X		X	X			X			X			X			X		X			X		X		X	X			X	
Product 2		X		X	X			X		X			X			X				X	X	X					X			X
Product 3		X				X	X					X		X	X		X		X					X			X	X		
Product 4	X		X		X	X					X	X					X		X				X	X						X
Product 5			X	X				X			X		X		X			X		X			X			X		X		X
Product 6		X			X		X	X			X			X				X			X	X				X	X	X	X	
Product 7				X				X			X	X				X			X		X			X			X			X
Product 8	X		X			X			X	X		X		X			X			X					X				X	
Product 9	X	X			X	X			X	X			X		X	X			X			X			X	X	X			X
Product 10				X			X				X	X			X	X		X	X	X				X	X	X		X		
Product 11			X					X	X	X			X	X	X		X	X		X		X	X		X			X	X	
Product 12	X	X			X	X	X							X			X				X	X	X	X					X	

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The labor intensity of manufacturing products according to technical process operations is given in Table 3.

Table 3

Labor intensity of products according to operations

Product	Labor intensity for operations, min						
	1	2	3	4	5	6	7
Product 1	2.2	2.2	4.5	2.8	2.7	4.1	2.1
Product 2	2.3	3.8	4.1	1.2	3.8	3.2	–
Product 3	3.1	2.4	5.8	1.1	3.2	3.2	1.5
Product 4	3.3	2.8	3.2	2.3	3.3	4.8	–
Product 5	–	1.8	3.7	2.3	3.9	3.4	1.8
Product 6	2.8	2.7	4.1	1.9	2.1	3.3	–
Product 7	2.9	1.8	3.1	1.5	3.7	3.5	1.2
Product 8	3.2	1.5	3.9	0.8	3.2	2.4	2.3
Product 9	3.5	1.1	2.9	3.9	4.4	–	–
Product 10	4.5	3.6	3.9	2.8	4.5	2.7	–
Product 11	4.8	2.8	3.5	1.4	2.8	2.9	1.5
Product 12	4.2	–	3.1	2.5	5.2	–	1.2

The norms of consumption of materials for products and the program of production for the year are given in Table 4.

Table 4

Material consumption rates and the product release program for the year

Product	Material	Rate of costs per product, kg	The price of the material per 1 ton, UAH	Size	Production program for the year, pcs
1	2	3	4	5	6
Product 1	Art. 45 steel	3.2	42 000	Big	12 000
Product 2	Steel 40X	4.3	51 040	Average	28 500
Product 3	Steel Art. 50	3.8	52 980	Small	31 500

Table 4 (the end)

1	2	3	4	5	6
Product 4	Steel Art. 5	4.1	48 820	Big	41 000
Product 5	Steel 35X	3.7	48 940	Average	26 000
Product 6	Steel 30X	4.2	41 020	Small	22 000
Product 7	Steel 20KHN	1.7	41 290	Big	28 000
Product 8	Steel 40KHM	2.9	41 200	Average	47 600
Product 9	Steel 38KHMNA	2.8	49 280	Small	46 400
Product 10	Steel 40KHMT	2.5	51 350	Big	39 600
Product 11	Steel 45KhVN	2.9	51 420	Average	36 000
Product 12	Steel 35KhVN	3.7	55 480	Small	42 000

The characteristics of the equipment used in the manufacture of products are given in Table 5.

Table 5

Characteristics of the equipment

Machine type	Engine power, kW	Dimensions w × d × h, mm	Price, UAH
Equipment 1	10	2 490 × 1 330 × 1 740	52 500
Equipment 2	15	2 465 × 1 213 × 1 900	58 900
Equipment 3	1.5	1 550 × 1 170 × 2 100	37 900
Equipment 4	2.0	1 360 × 1 860 × 1 530	35 200
Equipment 5	3	950 × 650 × 2 460	31 100
Equipment 6	7	2 600 × 2 040	47 000
Equipment 7	3.5	1 300 × 350 × 1 900	32 200

Reference data and regulations

1. The effective operating time of the equipment during one-shift work is 1 920 machine-hours per year, during two-shift work it is 3 840 machine-hours per year.

2. The number of auxiliary workers is 35 % of the main staff, including those engaged in maintenance and repair of equipment, 60 % of the total

number of auxiliary workers. The number of management personnel is 18 % of the main and auxiliary workers.

3. The wages of main and auxiliary workers are hourly with bonuses.

4. The premium for main and auxiliary workers is 15 % and 10 % respectively and 25 % of the basic salary for managers and specialists.

5. The average hourly tariff rate is 52 UAH for main workers, 45 UAH for auxiliary workers, 60 UAH for specialists, 72 UAH per hour for managers.

6. The working time budget of one worker (useful annual fund of the working time of one worker) is 1850 hours per year.

7. Additional salary is 13 % of the basic salary.

8. Deductions for social events make 21 % of the basic and additional wages.

9. The price of motor electricity is 2.64 UAH per kWh, the price of lighting is 1.94 UAH per kWh.

10. Lighting energy costs make 1 % of motor costs (kW/h).

11. The coefficient of use of the useful area is 0.43.

12. The area for management services is 15 % of the production area.

13. Auxiliary area is 20 % of the production area.

14. The area of warehouses is 12 % of the production area.

15. The cost of one square meter of the house is 120 hryvnias.

16. The coefficient of compliance with production standards is 1.1.

17. The duration of one reset is 30 minutes.

18. Allowable costs for readjustment make 4 %.

19. The number of working days in a month is 20.

20. The cost of auxiliary materials is 8 % of the cost of the main ones.

21. Non-production costs make 7 % of the production cost.

22. The planned profitability of products is 16 %.

23. Expenses for property insurance make 54 000 UAH.

24. Costs for technological equipment and tools make 2.5 % of the cost of the equipment.

25. The material utilization factor is 0.91.

26. The price of a ton (without VAT) of waste is 7 350 UAH.

The course work is drawn up in the form of an explanatory note with the necessary drawings and diagrams. Drawings and diagrams are made using

software products of the student's choice (for example: PowerPoint, Microsoft Visio, Freeware and others) with a stamp in accordance with DSTU. It is recommended that schemes and drawings be developed using a computer.

The explanatory note should contain the following sections:

Initial data according to option number.

Introduction.

1. Operating system design.

1.1. Determination of the type of operating system and calculation of the required amount of equipment.

1.2. Determination of the required area.

1.3. Calculation of the number of workers.

1.4. Designing the organizational structure of the enterprise management.

2. Organization of operative management of the operating system.

2.1. Determination of the form of production organization and operational management system.

2.2. Calculations of calendar-scheduled standards.

2.3. Construction of the work schedule of the processing subsystem.

3. The main technical and economic indicators of the operating system.

3.1. Calculations of the cost of materials.

3.2. Calculations of the wage fund.

3.3. Cost calculations and product prices.

3.4. Calculations of economic efficiency indicators.

Conclusions.

Used literature.

1. The operating system design

1.1. Determination of the type of operating system and calculation of the required number of equipment units.

The determination of its type begins with the selection of the type of processing subsystem based on the complex characteristics of the technical, organizational and economic features of production, determined by its specialization, volume and repetition of the production of products.

The type of processing subsystem is selected based on the calculations of equipment load factors. At the same time, the operation mode of the company's operating system is determined.

The number of the required equipment units NEq_{calc} is calculated according to the group (*j*) based on the labor intensity of product manufacturing programs, according to operation using the formula:

$$NEq_{calc\ j} = \frac{LI_{pr\ j}}{F_{ot} \times C_{fpn\ j}}, \quad (1)$$

where $LI_{pr\ j}$ is the labor intensity of product release programs for the *j*-th operation;

F_{ot} is the effective equipment operating time fund;

$C_{fpn\ j}$ is the coefficient of fulfillment of production norms (it is supposed to be the same for all operations: 1.1).

The estimated number of jobs is rounded to whole numbers and the accepted amount of equipment is determined by NEq_{det}.

Next, the loading coefficients $C_{load\ j}$ of the equipment according to groups are calculated using the formula:

$$C_{load\ j} = \frac{NEq_{calc\ j}}{NEq_{det\ j}}. \quad (2)$$

Calculations of load factors should be carried out for each product and for the enterprise as a whole for one- and two-shift modes of operation. The results of the calculations should be presented in the form of Tables 6 and 7.

Table 6

Calculation of the number of equipment units and its loading coefficients in a one-shift mode

Operation	Machine type	Product				Product				Product				Product				Σ LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$
		LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ jd}$	LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$	LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$	LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$				
		Σ	Σ	Σ		Σ	Σ	Σ		Σ	Σ	Σ		Σ	Σ	Σ		Σ	Σ	Σ	

Table 7

Calculation of the number of equipment and its loading coefficients in a two-shift mode

Operation	Machine type	Product				Product				Product				Product				Σ LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$
		LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ jd}$	LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$	LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$	LI_{pr}	NEq_{calc}	NEq_{det}	$C_{load\ j}$				
		Σ	Σ	Σ		Σ	Σ	Σ		Σ	Σ	Σ		Σ	Σ	Σ		Σ	Σ	Σ	

The type of production is determined on the basis of the calculated coefficients of equipment loading. For the large-scale type, the loading of the equipment should be no lower than 85 – 90 %, for serial type it is no lower than 85 – 75 %.

To make a final decision about the mode of operation of the enterprise, it is necessary to compare the total costs associated with the organization of one-shift and two-shift modes of operation. To do this, it is necessary to calculate the cost of the equipment, the cost of the useful area and the cost of motor electricity for each mode of operation, compare them and choose the one where the total costs are the lowest.

The cost of the equipment is calculated on the basis of data on the unit cost of the machine and the accepted number of machines for each mode of operation of the enterprise (Table 8).

Table 8

The cost of the equipment

Machine type	Price, UAH	Number of machines		The cost of the equipment, hryvnias	
		one-shift mode	two-shift mode	one-shift mode	two-shift mode

The cost of the useful area is calculated based on the data on the area per machine, the accepted number of machines according to the option, the cost of one square meter of area (Table 9).

Table 9

The cost of the useful area

Machine type	The cost of $1m^2$, UAH	Area per machine, m^2	Required number of machines, units		Cost of useful area, hryvnias	
			one-shift mode	two-shift mode	one-shift mode	two-shift mode

The cost of motor electricity (C_{me}) is calculated according to the formula:

$$C_{me} = P_{kWh} \times 1.2 \times F_{ot} \times P_{eng}, \quad (3)$$

where P_{kWh} is the price of one kWh of motor electricity, UAN;

1.2 is the coefficient that takes into account energy losses according to technical reasons;

F_{ot} is effective equipment operating time fund, hours;

P_{eng} is the total installed power of engines, kW.

The total installed power of the engines in different modes is calculated in Table 10.

Table 10

The total installed power of engines

Machine type	Power, kW	Required number of machines, units		Total power, kW	
		one-shift mode	two-shift mode	one-shift mode	two-shift mode

After calculating the main costs that depend on the mode of operation, the results are entered in Table 11, which determines the mode of operation of the operating system.

Table 11

Comparative costs in different modes of operation of the operating system

Mode	Equipment cost, UAH	The cost of the useful area, UAH	The cost of the motor energy, UAH	Total costs, UAH
One-shift mode				
Two-shift mode				

The total area of a small enterprise includes production, support, warehouse and management services space. The production area is calculated based on the useful area, taking into account the coefficient of use of the useful area.

Based on the calculations of the number of equipment units and the area, depending on the type of processing subsystem, one of the main types of planning solutions is selected: post-operational functional, linear flow or fixed positional planning scheme. When designing a linear flow diagram, one should take into account the possibility of organizing a single or multi-subject flow line.

1.2. Determination of the required area.

To determine the required area, first calculate the total useful area (Table 12).

Table 12

Total useful area

Machine type	Area per machine, m^2	The required number of machines for a two-shift mode, units	Total useful area, m^2

The total area of a small enterprise includes production, support, warehouse and management services space. The production area is calculated based on the useful area, taking into account the coefficient of use of the useful area. The obtained results are listed in Table 13.

Table 13

Area sizes of small enterprises

Type of area	Size, m^2
Useful	
Production	
Auxiliary	
Warehouse	
For management services	
Total	

1.3. Calculation of the number of workers.

The number of workers is calculated according to the category. The number of main workers is calculated on the basis of data on the total labor

intensity of the annual production program and the useful fund of the working time of one worker according to the formula:

$$N_{mw} = \frac{\sum LI_{pr}}{F_{wtow} \times C_1}, \quad (4)$$

where N_{mw} is the number of main workers;

$\sum LI_{pr}$ is the total annual labor intensity of product manufacturing programs, standard hours;

F_{wtow} is useful annual fund of working time of one worker, hours;

C_1 is the coefficient of compliance with production standards.

The number of auxiliary workers and managers is first established in an enlarged manner, and then they are distributed according to speciality on the basis of knowledge about the types of activities and management functions at the enterprise (Table 14).

Table 14

Staff of a small enterprise

Workers	Number of people
Main workers	
Auxiliary workers	
Including those engaged in maintenance and repair of equipment	
Management staff	
Total	

1.4. Designing the organizational structure of the enterprise.

Based on the results of the calculations, an organizational structure of enterprise management is created. An example is given in Fig. A.1 (Appendix A). The number of specialists and managers is determined based on the organizational structure. It is necessary to carefully describe the functions of each manager and specialist, based on the requirements of the organization of management at a small enterprise.

Next, a diagram of the interconnection of the elements of the processing, supply and planning subsystems of the operating system of the enterprise is designed. For each of the subsystems, it is necessary to show what methods of organization or management, means and objects of work, personnel are used.

2. Organization of operative management of the operating system

Planning the work of a single-item intermittent flow line (large-scale production type)

On single-item flow lines, items of the same name are produced and each workplace specializes in the performance of one detail-operation. Continuous-flow and intermittent-flow (direct-flow) lines are most widespread. On continuous-flow lines, the duration of individual operations is equal to or a multiple of the cycle time of the line. On intermittent-flow lines, the performance of operations is different and their duration is not coordinated with the line's operating cycle. On such lines, the leveling of the work of the line as a whole and of individual workplaces is achieved during the service period (turnover), when the same number of objects is produced on the line as a whole and in individual operations.

***Task conditions*.** At the mechanical department with mass (large-scale) type of production, it is proposed to organize an intermittent-flow (direct-flow) line. The initial data for designing the line are given in Tables 3 – 4.

Do the following:

calculate the cycle time of the line;

determine the number of jobs in operations and their loading, as well as the loading of the line as a whole;

choose a service period (turnover);

build a schedule (a standard plan) of the line operation;

determine the need for labor and establish the work schedule of operators;

calculate the values of technological, transport, reserve and turnover stocks;

build a schedule of movement of inter-operational stocks;

determine the total circulating and cycle stocks on the line.

Methodical instructions. First, the cycle time of the line, the number of workplaces and their loading are calculated.

The cycle time of line *r* is determined by the formula:

$$r = \frac{T_{eff} - T_{br}}{P_{l-s}}, \quad (5)$$

where T_{eff} is the effective time of line operation;

T_{br} is time for regulated breaks;

P_{l-s} is the line start-up programme at the production site.

The number of workplaces for operations (N_{pj}) is calculated by the formula:

$$N_{pj} = \frac{L_{in\,op}}{r}, \quad (6)$$

where $L_{in\,op}$ is the labor intensity for operations, min.

The enterprise cannot have more than a whole number of employees or not have a whole number of jobs. Therefore, we round the obtained value to a whole. This indicator is called the accepted number of jobs ($N_{ac\,j}$). For each operation, the loading coefficients $C_{load\,j}$ is determined according to the formula:

$$C_{load\,j} = \frac{N_{pj}}{N_{ac\,j}}. \quad (7)$$

In cases where the overload of one workplace does not exceed 10 %, the calculated number of workplaces may be rounded down. At the same time, it is necessary to recalculate the time norm of the corresponding operation to ensure 100 % loading of the equipment.

The line load factor is calculated by the formula:

$$C_{load} = \frac{\sum N_{pj}}{\sum N_{ac\,j}}, \quad (8)$$

where $\sum N_{pj}$ *is the sum of the estimated number of jobs;*

$\sum N_{ac\,j}$ *is* the sum of the number of jobs accepted.

In order to build a line work schedule (a standard plan), the loading of underloaded workplaces is determined. The loading factor of an underloaded

workplace, T_2, is equal to the number after the decimal point in the estimated number of workplaces.

To set the line operation mode, the service period P_s, is selected, the lower limit of which is the line operation cycle, and the upper limit is a day. It is most rational to set the following service periods: 30 – 60 min for big products, 1 – 2 hours for average products, 4 – 8 hours for small products.

After selecting the service period, the working time of the underloaded workplace is determined $T_{und\,w}$:

$$T_{und\,w} = T_2 \times P_s. \quad (9)$$

When building the line's work schedule, one should try to ensure that the established order of work of the machines ensures the full use of working time based on the application of multi-machine maintenance and the combination of professions.

The number of operators on the line is determined in accordance with the number of workplaces depending on the mode of operation and service standards. The worker's index can be both in the form of a number and in the form of letters, the main thing is that they are individual and not repeated.

The results of the calculations are entered in Table 15.

Table 15

The work schedule of the line

Operation	Normal time for operation, min	Estimated number of jobs	Accepted number of jobs	The load factor of an underutilised workplace	Operating time of an underloaded location, min	Worker index	Service period, min
1							
2							
3						…	
4						…	
5						…	
6						…	
7						…	

Next, the amounts of technological, transport, reserve and working stocks are calculated.

Technological reserve is products that are directly in processing or assembly at the workplaces of the line. The value of the technological reserve R_{tech} on the line is equal to:

$$R_{tech} = \left(\sum {}_{m}^{1} N_{pj} \times n_{prj}\right) + n_{contr}, \quad (10)$$

where n_{prj} is the number of items processed at the same time workplace;

n_{contr} is the number of items at the controller's workplace;

m is the number of operations on the line.

Transportation reserve includes products that are in the process of being moved between line workstations. The value of the transport reserve R_{trans} on the line is equal to:

$$R_{trans} = p_{tr}\,(m - 1), \quad (11)$$

where p_{tr} is the transfer party.

Reserve (insurance) stock is created for operations that are unstable in terms of execution time. It is designed to neutralize the negative impact on the rhythm of production of unforeseen interruptions in the operation of a particular type of equipment or fluctuations in the size of transport lots due to the random nature of the failure of individual products, etc.

Circulating inter-operational division (circulating reserve between adjacent operations) is created between adjacent operations due to their different labor intensity (productivity). Its value is calculated on the basis of the flow line schedule. In order to calculate the interoperational turnover allocations between adjacent operations, the service period is divided into partial periods of time, during which the same number of machines work on two adjacent operations. Working reserve R_w between adjacent operations is calculated according to the formula:

$$R_w = \tau \times \left(\frac{N_{ac\ j}}{L_{in\,op\ j}} - \frac{N_{ac\ j+1}}{L_{in\,op\ j+1}} \right), \quad (12)$$

where R_w is working reserve between adjacent operations;

τ is the time during which the same number of machines is used in two adjacent operations;

$N_{ac\ j}$, $N_{ac\ j+1}$ are the number of machines operating simultaneously, respectively, on the previous and subsequent operations during time τ;

$L_{in\,op\,j}$, $L_{in\,op\,j+1}$ are the labor intensity for operations, respectively, on the previous and subsequent operations, min.

Based on the calculations, a schedule of the movement of working stocks is built. When building it, the following rules must be followed:

1. The algebraic sum of working stocks for operations is equal to 0 (zero).
2. The "+" sign indicates the growth (increase) of the stock over the given period of time, the "–" sign indicates the reduction (decrease) in the stock.
3. The amounts of stocks for operations at the beginning and at the end of the service period are the same.
4. Under other conditions, the line's work schedule should be such as to ensure the smallest total amount of turnover on the line. The total working stock on the line is equal to the sum of the inter-operational working stocks at the beginning (end) of the service period or at any other point in time.

Planning the work of a multi-subject variable flow line (large-scale production type)

A variable flow line is a group of equipment that is placed according to the course of the technological process and behind which several names of items with a uniform technological route are fixed. These items are alternately produced on all or most of the machines connected in a line. When switching from the production of one object to another, it is necessary to reconfigure the line, its workplaces – all or part of it.

Multi-subject flow lines are typical for large-scale production, have a fairly high flexibility, a lower degree of specialization of the line and its workplaces. They can be organized as continuous-flow and direct-flow.

As a rule, multi-subject variable flow lines (MSVFL) are used in serial production, in particular in procurement and processing shops of machine-building and radio engineering enterprises. Although quite often they are also used in assembly shops, if the assembly operations are not carried out manually, but with the help of technical means or if there is a deficiency in some operations of the technological process.

Task conditions. The parts of five items are processed on the variable flow line. The line operates 20 working days a month in two 8-hour shifts. Time spent on reconfiguration is 5 %. Initial data on the labor intensity of products $L_{in\,op}$ are given in Table 3 and the monthly output program P_m is calculated on the basis of the annual program given in Table 4.

Do the following:

determine the average and partial cycle times of the line, the number of workplaces on the line and their loading;

calculate the duration of the monthly task for each type of the parts;

calculate start-up batches for each of the parts and establish the periodicity of their start-up;

build a line work schedule for a month.

Methodical instructions. The calculation of the average cycle time r_{av} is based on the effective fund F_{eff} of line operation for a month and the total program of the production of parts for a month:

$$r_{av} = \frac{F_{eff}}{\sum_1^k N_i}, \quad (13)$$

where k is the number of parts attached to the line;

N_i is the production program of the i-th part per month.

Calculations of partial cycles r_{av} are conducted for each part on the basis of data on the duration of the monthly task for the part and the monthly program of its production:

$$r_i = \frac{F_i}{N_i}, \quad (14)$$

where F_i is the duration of the monthly task;

N_i is the monthly program for the production of the i-th part.

Duration of the monthly task (in minutes and shifts) F_i is determined based on the share of the labor intensity of the monthly program for the i-th part in the total monthly labor intensity of the production of all parts attached to the line and the monthly effective fund of the line's working time:

$$F_i = F_{eff} \times \Delta_i, \quad (15)$$

where F_i is the duration of the monthly task;

Δ_i is shares of the labor intensity of the monthly program for the i-th part in the total monthly labor intensity of the production of all parts;

F_{eff} is the monthly effective line operating time fund.

$$\Delta_i = \frac{L_{in\ p\ i}}{\sum_1^k L_{in\ p\ i}}. \quad (16)$$

The effective time fund is calculated in minutes and shifts (f or charting). It should be taken into account that the total duration of the monthly task for all parts manufactured on the line is equal to the monthly fund of the line's working time:

$$L_{in\ p\ i} = L_{in\ op} \times N_i, \quad (17)$$

where $L_{in\ p\ i}$ is the labor intensity of the monthly program *i*-th part.

The required number of jobs on the line ($NE_{q\ calc}$) is calculated for each part according to the formula:

$$NE_{q\ calc} = \frac{L_{in\ op}}{r_i}. \quad (18)$$

Rounding of the calculated number of workplaces to the whole is carried out according to the usual rules. The loading coefficient of the equipment on the line is determined for each part.

The size of the batch of products *i* (S_{calc}) is calculated as minimal, based on the time spent on reconfiguring the line, the partial cycle and the coefficient of allowable costs (α), which is accepted within 0.03 – 0.08:

$$S_{calc\ i} = \frac{P \times (1 - \alpha)}{\alpha \times r_i}, \quad (19)$$

where *P* is the loss of time for readjustment of the line for the production of one part per second. These losses are calculated by division of the total time spent on reconfiguring the line by the number of parts to the line.

The estimated frequency of launch-release of the batch R_{calc} is determined for each part based on data on the size of the batch, the monthly program and the duration of the monthly task of this part on the line (in days):

$$R_{calc\ i} = \frac{F_i \times S_{calc\ i}}{N_i}. \quad (20)$$

Further, the periodicity is reduced to values corresponding to a unified series of periodicities. The periodicity is assumed to be the same for all parts.

All calculations can be made in Table 16 in the following form.

Table 16

Normative calculations

Part	N_i, pcs	$L_{in\ op}$, min	$N_i \times L_{in\ op}$	Δ_i	F_i		r_i, min / pcs	$NE_{q\ calk}$	$NE_{q\ det}$	C_{load}	$S_{calc\ I}$, pcs	$R_{calc\ i}$	R_{tak}	$N_{launcher}$
					min	change								

Analysis of normative calculations should show that:

when manufacturing different parts, the number of workplaces is the same, and this is very important from the point of view of using the equipment;

loading of the equipment meets the requirements of mass production and ensures the fulfillment of the monthly task;

the size of the batch for each of the parts is equal to or a multiple of the monthly program.

On the basis of the calculations, the schedule of the variable flow line is built for a month, taking into account the periodicity of the start-up of batches of parts. The order of start-release of batches of parts on the line is determined on the basis of any selected priority rule.

Construction of the optimal schedule of the serial flow (group) line (serial type of production)

Subject-closed areas are areas in which various types of equipment are used, which are located along the course of the technological process. At such an area, employees perform a certain type of operations. There is no fixing of certain types of production jobs.

Subject-closed areas specialize in the production of a small range of items with a similar technological process. At such an area, the technical process includes, if possible, all operations in order to produce a finished item. This contributes to a significant reduction in the duration of the production cycle of manufacturing items, significantly simplifies operational planning and control over the course of production. A small nomenclature of manufactured items allows planning them in a post-production and post-operation section.

The planning of a subject-closed area usually includes the following stages:

definition of the technological process: determination of the sequence of operations performed at the area and the equipment that will be used;

development of a technical task: development of a document that contains requirements for equipment, materials, technology and other aspects of production;

development of drawings: development of drawings of equipment and other elements of the area;

determining resource needs: determining the required amount of materials, equipment, labor and other resources;

development of the work schedule: development of the work schedule, which determines the sequence of work at the area;

cost determination: determination of production cost and equipment cost;

development of a production plan: development of a production plan that determines the amount of products that will be produced at the area.

Thus, in order to build an optimal work schedule of a serial flow (group) line (serial type of production), you need:

to determine the normative values of batches of parts and the periodicity of their start-up;

to calculate the required number of machines and their loading;

to distribute the parts to be manufactured by the machines;

to build an operational standard plan-schedule of the area's work (a standard plan);

to determine the duration of the manufacturing cycles of batches of parts, the total duration of the manufacturing cycle of all batches, calculate the cycle density coefficients.

The preparatory and final time for each operation is presented in Table 17.

Table 17

Preparatory and final time, min (for all options)

Indicator	Operation						
	1	2	3	4	5	6	7
Preparatory and final time, min	15	20	20	16	10	10	5

The size of the batch is determined by the leading operation, in which the ratio t_{pf} up to $L_{in\ op}$ is the most among all operations of this technical process. Calculations are carried out in Table 18.

Table 18

Selection of a leading operation

Number of parts	The ratio t_{pf} up to $L_{in\ op}$ for operations					
	1	2	3	4	5	6

To determine the normative values of batches of parts, the calculation method based on the minimum allowable time spent on reconfiguring the equipment is used.

During the execution of the task, the percentage of allowable time spent on reconfiguring the equipment α is taken to be equal to 4.

The normative value of a batch of parts is calculated in two stages:

the first is the determination of the minimum size of the lot of parts n_{min}.

$$n = \frac{t_{pf}\ (100 - \alpha)}{\alpha \times L_{in\,op\,min}}, \tag{21}$$

the second is the adjustment of the minimum batch size in order to establish the compliance of the accepted batch size with a unified series of launch-release periodicities.

After determining the estimated batch size, the estimated periodicity is determined as the ratio of the estimated batch size to the average daily output. The normative periodicity is established by adjusting the calculated periodicity in accordance with a unified series of periodicities.

The normative batch is determined by multiplying the normative periodicity by the average daily output. It is necessary that the normative size of the batch be equal to the volume of the planned task per month or be a multiple of it.

When performing this task, it should be taken into account that the start-up frequency is set the same for the entire station.

Normative calculations are performed in Table 19.

Table 19

Normative values of batches of parts

Product number	Average daily release, pcs	Estimated value batches, pcs	Frequency, days		Normative value batches, pcs	The number of launches in month
			calculation	accepted		

Determining the required number of machines according to the types of equipment for processing parts assigned to the site is performed by

comparing the total labor intensity of processing for each operation with the nominal (regular) time fund of one machine per month. The estimated number of machines NEq_{calc} is rounded up to a whole value NEq_{det}. At the same time, an overload of machines up to 10 % is allowed. Next, the average loading coefficient of machines C_{load} according to operations is calculated. The results of the calculations are entered in Table 20.

Table 20

The required number of machines and their loading

Operation	Labor intensity of processing the monthly parts program taking into account t_{pf}, min				∑ Labor intensive operation, min	NEq_{calc}	NEq_{det}	C_{load}

Fixation of part-operations for machines is carried out for each machine by selecting the labor intensity of the monthly program of several parts in accordance with the nominal fund of the machine's working time per month and should ensure their uniform loading. For this purpose, the data in Table 20 are used. Fixation is carried out in Table 21.

Table 21

Fixation of part-operations between the machines

Operation	Equipment number	Number of parts that are fixed to the machine					Total monthly labor intensity of parts fixed to the machine, min	Load factor
	…							

To build a standard plan, you need to know:

technological routes of part processing;

normative values of batches of parts and the periodicity of their start-up;

data on fixing part-operations for the equipment;

data on the complexity of processing batches of parts for each operation, taking into account t_{pf} (calculations are made in Table 22).

Table 22

Labor intensity of manufacturing batches of parts

Operation	Equipment number	Labor intensity of processing batches of parts taking into account t_{pf} on operations									
		part 1		part 2		part 3		part 4		part 5	
		min	work shift	min	work shift	min	work shift	min	work shift	min	work shift

It is necessary to build a standard plan, observing the following conditions:

start the batch of parts into processing from the beginning of the shift and load the machine as much as possible for the entire shift;

try to reduce the duration of the batch of parts processing cycle as much as possible, for which, where possible, use a parallel-sequential type of movement of parts;

strictly adhere to the established periodicity of launching and releasing a batch of parts for individual operations;

first of all, build a standard plan for the most time-consuming parts.

On the basis of the constructed standard plan, the production cycles of batches of parts of each denomination and the entire set of parts (total duration of the cycle) are determined.

The cycle density coefficient is calculated for each of the parts as the ratio of the technological cycle of manufacturing a batch of parts in sequential movement to the production cycle according to the schedule.

The work schedule of the processing subsystem is drawn up on a separate sheet, an example of the schedule is presented. Such schedules can be presented in the form of either schedules of four single-subject intermittent flow lines, or a schedule of the work of a multi-subject variable flow line with a schedule of its operation during the manufacture of one of the products, or a standard plan of work of a subject-closed section.

3. The main technical and economic indicators of the operating system

Calculations of the main technical and economic indicators of the operating system are carried out on an annual program and include the development of an estimate of production costs and the determination of the wholesale price of each product.

The estimate of production costs is developed according to the categories and elements of costs. To compile it, it is necessary to calculate the cost of basic materials and returned waste for the annual production program, the annual wage fund for all categories of workers, deductions for social events, costs for maintenance and operation of equipment, general economic costs.

3.1. Calculations of the cost of materials.

Calculations of costs for basic materials in natural and value terms are shown in Table 23.

Table 23

Calculation of the cost of basic materials

Name of the material	Costs of basic materials, kg								Total costs per year, UAH	Price per ton, UAH	The cost of the annual program, UAH
	Part ...		Part ...		Part ...		Part ...				
	per unit of production	per program	per unit of production	per program	per unit of production	per program	per unit of production	per program			

The cost of returned waste is calculated based on the data on the rate of consumption, the rate of material utilization and the price of waste (Table 24). The cost of auxiliary materials is set inflated.

Table 24

Calculation of the cost of waste

Name of the material	Waste, kg								Total waste per year, kg	Price per ton, UAH	The cost of the annual program, UAH
	Part ...		Part ...		Part ...		Part ...				
	per unit of production	per program	per unit of production	per program	per unit of production	per program	per unit of production	per program			

3.2. Calculations of the wage fund.

The calculation of the wage fund is performed on the basis of the determined number of workers according to the category. For each category, taking into account the wage system, the salary is calculated on the basis of the given normative data. The number of specialists and managers is determined on the basis of the organizational structure designed in section 2. All calculations are carried out in Table 25.

Table 25

Calculation of the wage fund

Components of the payroll fund	Salary according to the category, UAH				
	Basic workers	Auxiliary workers	Managers		Total
			specialists	leaders	
Salary according to the tariff					
Awards					
Additional salary					
Total payroll fund					
Number of people					
Average salary:					
annual					
monthly					

Deductions for social activities are determined based on the standard (%) of the basic and additional wages.

3.3. Cost calculations and product prices.

The cost of maintenance and operation of the equipment is calculated for each item. Material costs include the cost of auxiliary materials and the cost of motive power. The cost of auxiliary materials is set inflated. Calculation of electricity costs is carried out according to formula 3.

Labor costs include the wages of auxiliary workers engaged in maintenance and repair of equipment. Deductions from their wages for social activities are established.

Depreciation of the equipment is calculated per year on a quarterly basis in accordance with the established norms from the residual value of the equipment, which belongs to group 3 fixed assets (depreciation rate per taxable quarter is 6 %). Calculations can be presented in the form of Table 26.

Table 26

Equipment depreciation calculations

Period	Residual value, UAH	Quarterly amount of amortization deductions, UAH
1st quarter		
2nd quarter		
3rd quarter		
4th quarter		
Total in one year		

Other costs include the costs of technological equipment and tools, which are set in excess.

General production costs include depreciation of the company's building (Table 27) the cost of which is calculated as the product of the total area of the company by the cost of one square meter of the building area. The building is included in group 1 of fixed assets, the quarterly rate of depreciation for which is 2 %.

Table 27

Building depreciation calculations

Period	Residual value, UAH	Quarterly amount of amortization deductions, UAH
1st quarter		
2nd quarter		
3rd quarter		
4th quarter		
Total in one year		

General production costs are also calculated separately for each component (Table 28). Material costs include costs for lighting electricity. Labor costs include salaries of managers, from which deductions for social activities are calculated. Other costs include property insurance costs.

Table 28

Cost estimate for production, UAH

Articles of expenditure	Cost elements					
	material costs	wages	deductions for social events	amortization	other expenses	total
Basic materials						
Returned waste						
Basic salary						
Additional salary						
Deductions for social events						
Equipment maintenance and operation costs						
General economic expenses						
Other production costs						
Total						

The calculation of the cost of products is carried out separately for each of the products (Table 29).

Table 29

Calculation of the cost of products

No.	Names of the cost of articles	%	Cost, UAH			
			Product …	Product ...	Product ...	Product ...
1	Raw materials and materials					
2	Returned waste					
3	Basic salary					
4	Additional salary					
5	Deductions for social events					
6	Equipment maintenance and operation costs					
7	General economic expenses					
8	Production costs					
9	Out of production costs					
10	Full cost					
11	Profit					
12	Rate of profitability of the product					
13	Wholesale price					

Direct costs (materials, returned waste, basic wages) are calculated on the basis of normative data. Indirect costs (equipment maintenance and operation costs) are allocated to products according to the calculated percentages or distribution rates. The allocation rate is the ratio of the total amount of indirect costs to the selected base.

The following can be selected as the base: the basic salary, the sum of the basic and additional salaries, the sum of the basic salary and expenses for the maintenance and operation of the equipment, etc.

On the basis of the cost of products and the rate of profitability, wholesale prices are determined and the annual volume of commercial products is determined.

3.4. Calculations of economic efficiency indicators.

To evaluate the efficiency of the designed operating system of a small enterprise, relative economic indicators are calculated:

expenses per 1 hryvnia commodity products:
labor productivity of workers;
volume of merchandise per 1m^2 of production area;
armed forces;
capital capacity;
fund return;
turnover of working capital (turnover ratio and duration of one turnover);
total profitability;
profitability of the enterprise;
payback period.

The indicator of costs per 1 hryvnia of production is an important indicator for the analysis of the cost of production and production costs. This indicator is calculated according to the formula:

$$E = C / P, \quad (22)$$

where E is expenses per 1 hryvnia of products;
C is the unit cost of a certain type of product;
P is the unit price of a certain type of product.

The most general and universal indicator that reflects the efficiency of the use of labor resources (personnel) of the enterprise is the labor productivity of employees. In a general sense, labor productivity characterizes its effectiveness, that is, evaluates the result of labor obtained per unit of costs associated with the use of labor resources of the enterprise. Thus, labor productivity is equal to the ratio of the volume of production to the number of employees.

Capital equipment is an indicator that helps to determine the degree to which all employees are provided with fixed assets of the enterprise. It is calculated using the formula:

$$CE = VFA / ANIPP, \quad (23)$$

where VFA is the value of fixed assets;
$ANIPP$ is the average registered number of industrial and production personnel of the enterprise.

Capital intensity is a financial indicator that testifies to the effectiveness of the management of fixed production assets and shows the value of fixed assets per unit of manufactured (sold) products. The main means of production include: buildings, structures, equipment, machines, transport, production equipment, that is, what ensures the production process of the enterprise. The capital intensity ratio is inversely proportional to the capital return.

Return on assets is an indicator of the company's business activity, which demonstrates the efficiency of using the company's fixed assets. The value of the indicator shows how many products are produced and how many services are provided per each hryvnia of financial resources invested in fixed assets. It is calculated as the ratio of sales volume (revenue) to the average annual amount of fixed assets. The remaining amount of the cost of fixed assets is taken into account.

The efficiency of the use of working capital is characterized by the speed of its rotation, turnover. Acceleration of the turnover of these funds leads to an increase in the volume of production for each monetary unit of the company's current expenses and the release of part of the funds, and thanks to this, the creation of additional reserves for the expansion of production.

The less working capital is delayed at individual stages, the faster its cycle is completed. Thus, indicators characterizing the turnover rate of working capital are indicators of the efficiency of their use. Effective use of working capital is characterized by the turnover ratio, which is calculated by dividing the cost of sold products at current wholesale prices for a certain period by the average balance of working capital for the same period. The turnover ratio shows how many turnovers were made by working capital during a certain period.

The duration of one turnover (speed of turnover) of working capital is determined by the ratio of the number of days in the period to the turnover ratio.

Profitability is an indicator of economic efficiency which characterizes the profitability of the operation of the enterprise. The presented characteristic makes it possible to understand the degree of effectiveness of the company's use of its own resources. Profitability is compared with the efficiency ratio – the ratio of total costs to final profit. In other words, total profitability is the ratio of revenues to costs.

The indicator of the profitability of the production process describes how appropriate it is to conduct a certain business. The indicator of total profitability appears in the form of a ratio between production costs and final net income.

The payback period is the minimum time interval (measured in months or years) from the start of project implementation to the achievement of goals, during which investment costs are covered by the cash income generated by them. The payback period can be calculated as the ratio of the amount of funds invested in the project to the net profit in an average year.

Designing the course work

The course work must be written in English. The text of the term paper is typed on a computer.

The font of the text editor is Word Times New Roman, size 14 pt; in figures and tables font size is 12 pt; line spacing: 1.5 in the main text and 1.2 in figures and tables; formatting of the main text and links is in the width parameter; paragraph is 1.25 cm. The print font should be clear, the density of the text should be the same.

Margins should be 30 mm left, 20 mm top, 15 mm right, 20 mm bottom. Pages are numbered in the upper right corner of the page.

The title page is drawn up according to the sample given in Appendix B. Tables are numbered in accordance with the section number.

The author's signature is placed on the title page of the term paper.

The course work must be completed on time and submitted to the supervisor for review three days before the defense.

Criteria for evaluating the course work

The performance of the course work is evaluated according to a 100-point cumulative evaluation system. The rating evaluation of the course work contains formal and substantive criteria (Table 30).

The maximum possible score for the fulfillment of the course work is 20 points based on the formal criteria and 35 points based on the substantive criteria; defense of the course work gives 45 points. The minimum possible score for the fulfillment of the course work is 10 points based on the formal criteria, 20 points based on the substantive criteria; 30 points for the defense of the term paper.

The defense of the course work is carried out according to the schedule of the educational process. The defense of the course work takes place in the form of a presentation of the completed course work up to 5 – 7 minutes, during which the applicant reveals the purpose and tasks of the given work, briefly presents the material, the methods used and the obtained research results, provides answers to the questions of the commission members.

Table 30

Criteria for evaluating the course work

Evaluation criteria	Points
Formal criteria	
Correctness of registration	10
Adherence to the deadlines for submitting the course work	10
Total according to the formal criteria	**20**
Substantive criteria	
The correctness of choosing the mode of operation and type of production	5
Correctness of calculations when designing the organization of operational management	10
Providing conclusions based on the results of calculations of economic efficiency indicators	10
Availability and correctness of the work schedule or standard plan (drawing)	10
Total according to the substantive criteria	**35**
Defense of the term paper	
Possession of information and ability to present material	15
Answers to questions	30
Total for the defence of the course work	**45**
Total for the course work	**100**

The final grade for the course work in the educational discipline is given according to the 100-point cumulative evaluation system.

Recommended literature

Main

1. Веретенникова Г. Б. Планування та організація діяльності під-приємства [Електронний ресурс] : навч. посіб. / Г. Б. Веретенникова,

В. В. Томах, І. М. Геращенко ; Харківський національний економічний університет ім. С. Кузнеця. – Електрон. текстові дані (2,45 МБ). – Харків : ХНЕУ ім. С. Кузнеця, 2020. – 209 с. : іл. – Загол. з титул. екрану. – Бібліогр.: С. 205–206. – Режим доступу : http://repository.hneu.edu.ua/handle/123456789/26529.

Additional

2. Захаров В. А. Конкурентне середовище промислового підприємства та його вплив на операційний менеджмент / В. А. Захаров // Вісник Одеського національного університету. Серія: Економіка. – 2019. – Т. 24, вип. 1. – С. 54–58.

3. Кондратюк О. М. Бізнес–планування в підприємницькому середовищі: теоретичний аспект / О. М. Кондратюк, В. І. Пшеничний // Науковий вісник Ужгородського національного університету. Серія: Міжнародні економічні відносини та світове господарство. – 2019. – Вип. 26 (1). – С. 90–94.

4. Планування та організація діяльності підприємства [Електронний ресурс] : методичні рекомендації до практичних завдань та самостійної роботи студентів спеціальності 073 "Менеджмент" першого (бакалаврського) рівня / уклад. В. В. Томах, Г. Б. Веретенникова, І. М. Геращенко ; Харківський національний економічний університет ім. С. Кузнеця. – Харків : ХНЕУ ім. С. Кузнеця, 2019. – 93 с.

Information resources

5. Планування та організація діяльності підприємства. Модуль 1. Сайт персональних навчальних систем ХНЕУ ім. С. Кузнеця. – Режим доступу : https://pns.hneu.edu.ua/course/view.php?id=6590.

6. Планування та організація діяльності підприємства. Модуль 2. Сайт персональних навчальних систем ХНЕУ ім. С. Кузнеця. – Режим доступу : https://pns.hneu.edu.ua/course/view.php?id=6567.

Appendices

Appendix A

An example of the organizational structure of the enterprise

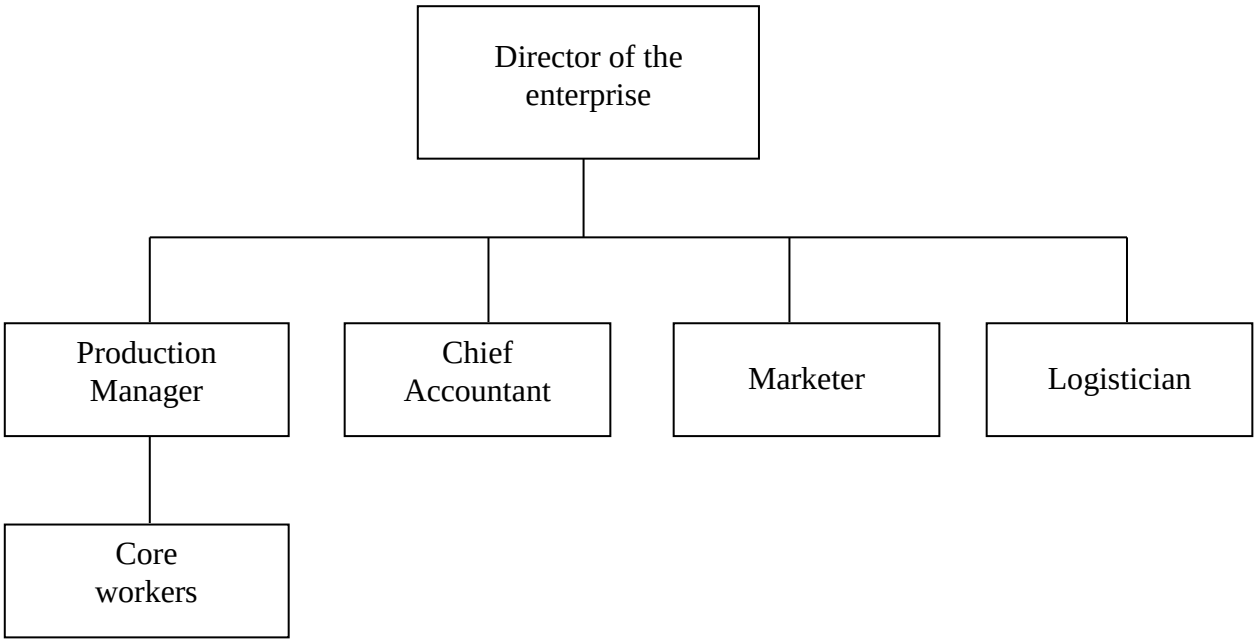

Fig. A.1. **The organizational structure of the enterprise**

Appendix B

A sample title page

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

Department of Management, Logistics and Innovation

Course work
Planning and Organization of the Company Activities

Performed by: student of _____ course
group _____ speciality 073 "Management"
of the educational and professional program
_____

_____ SURNAME I.
(signature) (surname and initials)

Head:
Associate Professor of the Departments
of Management, Logistics and Innovations
of S. Kuznets KhNUE _____ SURNAME I.
(signature) (surname and initials)

Number of points: _____

Commission members _____ _____
(signature) (surname and initials)

_____ _____
(signature) (surname and initials)

_____ _____
(signature) (surname and initials)

2024

Contents

НАВЧАЛЬНЕ ВИДАННЯ

Планування та організація діяльності підприємства

Методичні рекомендації до виконання курсової роботи

для здобувачів вищої освіти спеціальності 073 "Менеджмент" освітньої програми "Логістика" першого (бакалаврського) рівня

(англ. мовою)

Самостійне електронне текстове мережеве видання

Укладачі: **Геращенко** Інна Миколаївна
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Коректор: *З. В. Зобова*

Подано методичні рекомендації до виконання курсової роботи в процесі вивчення навчальної дисципліни, що сприяє закріпленню теоретичних знань здобувачів вищої освіти та набуттю навичок із планування й організації діяльності підприємства.

Рекомендовано для здобувачів вищої освіти спеціальності 073 "Менеджмент" освітньої програми "Логістика" першого (бакалаврського) рівня.

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