MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL TECHNICAL UNIVERSITY
"KHARKIV POLYTECHNIC INSTITUTE"

Department of Marketing

Methodical recommendations for the independent work of students in the discipline

MARKETING MANAGEMENT

for applicants of the second educational level of the program "Marketing", specialty 075 Marketing

Kharkiv 2025

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Compiler: V.Ya. Zaruba

Reviewer D.V. Rayko

Department of Market

Advice on planning and organizing the time for independent work necessary for studying the academic discipline

The independent work of the applicants consists in studying the lecture material (30 hours), preparing for practical classes and studying their material (30 hours), completing an individual task (16 hours), preparing for tests and the exam (10 hours).

THE INDEPENDENT WORK

No items	The name of the types of independent work	Number of hours
1	Studying the lecture material	30
2	Preparing for practical classes and preparation of reports	30
3	Independent study of topics and issues that are not taught in lectures	-
4	Completing an individual task	16
5	Preparing for tests and the exam	10
	That's all	86

At the beginning of the academic semester, students receive a synopsis of the lectures, methodical materials for practical classes, methodical recommendations for independent work, materials for current, intermediate and final control from the discipline "Marketing Management".

Before starting each practical classe, students should familiarize themselves with the content of the problems that will be solved in it, and with the methods (algorithms) of their solution. They are also obliged to regularly work out a synopsis of the lectures.

Below are topics and questions from the discipline "Marketing Management".

Topics and questions from the discipline "Providing Innovations"

Topics and questions from lectures

Topic 1. Understanding marketing management

1. Concepts and functions of marketing management. The concept of holistic marketing. Integrated marketing, socially responsible marketing (ethics, ecology, law, society), internal marketing, relationship marketing.
2. The marketing process of creating and providing consumer values. Phases of the process of creating and providing values. Value chain and value system concepts.
3. Enterprise strategies and the process of strategic marketing management. Corporate (generally organizational), business and functional levels of strategic marketing planning.

Topic 2. Development and analysis of the company's portfolio strategy

1. Marketing growth strategies. Growth matrices of I. Ansoff. Possibilities of intensive, integration and diversification growth according to F. Kotler.
2. The task of developing the company's portfolio strategy. Ensuring synergistic effects between different spheres of activity and strategic flexibility of the portfolio of strategic spheres of business.
3. Competitive forces according to M. Porter. Possible threats from manufacturers of analogue goods, manufacturers of substitute goods, new enterprises on the market, suppliers, consumers.
4. Evaluation of the attractiveness of the strategic business area (SBA). Potential economic efficiency of activities on the market. Correspondence of SBA to resources available to the enterprise Threats from competitive forces.
5. Matrix methods of corporate business portfolio analysis. BCG (Boston Consulting Group) and GE (General Electric) methods.

Topic 3 Marketing planning at the business and functional levels

1. Planning the activities of a non-diversified enterprise (business unit). Strategies of competitive advantages according to M. Porter. Cost leadership, wide differentiation, optimal costs, focused low-cost strategy, focused differentiation strategy (market niche strategy).
2. Development of a competitive strategy at the business level of planning. Solutions and research in the development of a competitive strategy. Strategies of undifferentiated, differentiated and concentrated marketing.
3. The general structure of the marketing plan at the functional level. Marketing strategy, action programs, budgets, control.

Topic 4. Tactical marketing management. Control, operational management and analysis of marketing activities

1. Tactical management of marketing as the formation of influence on the market. Direct, indirect and feedback links of the firm with the market.

2. The structure of the company's product offering. Distribution channels. Group and individual offers. Trading service.
3. The essence and directions of marketing control. Analysis of marketing activities.
4. Control system and principles. The principles of strategic focus, results orientation, appropriateness, timeliness, flexibility, simplicity and economy.
5. Marketing control over the implementation of annual plans. Analysis of sales potential, analysis of market share attributable to the enterprise, observation of customer relations and analysis of the ratio of marketing and sales expenses.

Topics of the practical classes

Topic 1. Analysis and forecasting of demand
1 Concept of forecasting and demand forecasting methods. Time series analysis methods.
2. The method of direct modeling of the trend. Trend modeling with preliminary series smoothing.
3. Regression models and their application in demand forecasting. Theoretical and sample regression models. Linear models of paired and multivariate regression. The method of least squares in building a linear model of multivariate regression.
4. Quantitative calculations of demand time series trend models. Discussion of the content of the calculation task.
5. Calculations of parameters of linear one-factor two-parameter regression models of demand time series using MS Excel.
6. Typical functions for trend modeling (regression functions).
7. Finding the values of the parameters of the nonlinear one-factor regression model of the time series of demand in the MS Excel environment.
8. Use of MS Excel tools for forecasting time series of demand taking into account the seasonality factor

Topic 2. Decision optimization models at the functional level
1. Modeling programs for implementing a set of marketing activities.
2. Finding the critical path and time reserves for non-critical work.
3. Model for choosing advertising distribution channels.
4. Quantitative calculations of the optimal allocation of the advertising budget.

Topic 3. Behavioral strategies of firms in oligopolistic commodity markets
1. Strategic static games in the study of the oligopolistic market. Multi-person actions situations affecting the action environment.
2. Principles of management optimality in games with non-opposite interests.
3. Models of achieving equilibrium in the oligopolistic market
4. Quantitative calculations of sales volumes and prices for goods of firms in the process of achieving market equilibrium.

Literary and information sources

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8. John Thompson, Jonathan M. Scott, Frank Martin. Strategic Management**:** Awareness and Change**. -** 10th edition**.** Cengage**,** 2022**. -**720 p.

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INDIVIDUAL CALCULATION TASKS

"Search for linear trends of time series of sales volumes"

1. GENERAL PROVISIONS

According to the curriculum of the "Marketing" specialty, the individual task from the "Marketing Management" educational discipline is: calculation task "Search for linear trends of time series of sales volumes". In the process of performing an individual task, along with theoretical knowledge and practical skills in the field, the student must demonstrate the ability to do scientific research and the ability to think logically and creatively.

The content of the report on the performance of an individual task

The text of the report should contain the following components.

Title page. Must contain the name of the university; name of the department; the name of the discipline; the topic of an individual task; surname, initials of the student, academic group index.

Content. Should reproduce the section titles with the page numbers on which they are placed.

Main part. Contains 5 chapters, which describe the content of the research. Chapter 1. Content of the task. It contains the task text in accordance with the set option. Chapter 2. Theoretical foundations of demand forecasting based on the extrapolation approach (method of time series analysis). A synopsis and additional literature may be used when teaching this section. Chapter 3. Forecasting sales volumes by the method of direct trend modeling. This section contains the results of part 1 of the task. Chapter 4. Forecasting of sales volume by the method of trend modeling with preliminary smoothing of the time series. This section contains the results of part 2 of the task. Chapter 5. Comparative analysis of results. It provides graphic material and evaluates the discrepancies in the results obtained by different methods.

Requirements for drawing up a report on the completion of an individual task. The report should be drawn up in accordance with the "Methodical instructions on the requirements for drawing up abstracts, course, diploma and master's theses" developed and approved by the department. The volume of the report on the performance of an individual task should be 12-15 pages.

2. TASK CONTENT

Over the past 4 years, the annual sales volumes of the company's products have amounted to v_i $(i = 1,2,...N = 4)$. It is assumed that the sales volumes change over time according to a dependence close to linear: $v_i \approx f[\alpha](\mathrm{i}) = \alpha_0 + \alpha_1 i$, where $f[\alpha](\mathrm{i})$ is a linear function considered as a trend model (regression function), i - year number, $\alpha = (\alpha_0, \alpha_1)$, α_0, α_1 - parameters of the regression dependence. Numerical data, which determine the values v_i $(i = 1,2,...N = 4)$ according to the options, are given in the table 1.

Table 1. Incoming data

№ option	v_1	v_2	v_3	v_4
0	10	20	30	40
1	30	20	10	40
2	10	30	20	40
3	10	30	40	20
4	10	40	20	30
5	10	40	30	20
6	20	10	30	40
7	20	10	40	30
8	20	40	20	40
9	20	30	10	40
10	20	30	40	10
11	20	40	10	30
12	20	40	30	10
13	30	10	20	40
14	30	10	40	20
15	30	20	10	40
16	30	20	40	10
17	30	40	10	20
18	30	40	20	10
19	40	10	20	30
20	40	10	30	20
21	40	20	10	30
22	40	20	30	10
23	40	30	10	20
24	40	30	20	10
25	10	30	20	40
26	10	30	40	20
27	10	40	20	30
28	10	40	30	20
29	20	10	30	40
30	20	10	40	30

It is necessary to find the value α_0^0, α_1^0 of undefined parameters α_0, α_1 using 2 methods:

1) direct modeling of the trend (part 1 of the task);

2) trend modeling with time series smoothing with an averaging interval equal to 3 (part 2 of the task).

It is also necessary: 1) plot the graphs of the functions $v(i) = v_i \ \ (i = 1,2,...4)$ $f[\alpha^0](\mathrm{i}) = f_1[\alpha^0](\mathrm{i}) \quad (i = 1,2,...4,5)$ (for task 1) and $f[\alpha^0](\mathrm{i}) = f_2[\alpha^0](\mathrm{i})$ $(i = 1,2,...4,5)$ (for task 2), 2) find the forecasted sales volume $v_5 = v_{51} = f_1[\alpha^0](5)$ within 5th year (for part 1 of the task) and $v_5 = v_{52} = f_2[\alpha^0](5)$ (for part 2 of the task).

Chapter 3. Forecasting sales volumes by the method of direct trend modeling. Part 1 of the task.

In direct modeling of the trend, the method of least squares is used to find the values α_0^0, α_1^0 of the undefined parameters α_0, α_1 $f[\alpha](\mathrm{i})$ of the function $f[\alpha](\mathrm{i})$:

$$U(\alpha^0) = \min_{\alpha}\{U(\alpha) = \sum_{i=1}^{N}(f[\alpha](\mathrm{i}) - \mathrm{v_i})^2\}.$$

The essence of the least squares method is to minimize the sum $U(\alpha)$ of squared deviations between the sales volumes calculated by the model and their actual values v_i, which were actually observed.

In order for the minimum of the function to be reached with the values of undefined parameters, the following conditions must be met:

$$\frac{\partial U(\alpha)}{\partial \alpha_k} = \sum_{i=1}^{N}\frac{\partial(\mathrm{f}[\alpha\ ](\mathrm{i}) - v_i)^2}{\partial \alpha_k} = 0 \ \ (k = 0,1).$$

These conditions define a system of two equations:

$$\sum_{i=1}^{N}((f[\alpha\ ](i) - v_i)\frac{\partial f[\alpha\ ](i)}{\partial \alpha_k}) = 0 \ (k = 0,1).$$

Because

$$\frac{\partial f[\alpha](i)}{\partial \alpha_0} = 1, \frac{\partial f[\alpha](i)}{\partial \alpha_1} = i,$$

then the optimal values α_0^0, α_1^0 of parameters α_0, α_1 are found from the following system of two equations:

$$\sum_{i=1}^{N}(\alpha_0 + \alpha_1 i - v_i) = N\alpha_0 + \alpha_1\sum_{i=1}^{N} i - \sum_{i=1}^{N} v_i = 0;$$

$$\sum_{i=1}^{N}(\alpha_0+\alpha_1 i-v_i)\text{i}=\alpha_0\sum_{i=1}^{N} i+\alpha_1\sum_{i=1}^{N} i^2-\sum_{i=1}^{N} v_i i=0.$$

These equations can be represented in the following form:

$$A_{11}\alpha_0+A_{12}\alpha_1=A_{10}, \quad (1)$$

$$A_{21}\alpha_0+A_{22}\alpha_1=A_{20}, \quad (2)$$

where $A_{11}=N=4,\ A_{10}=\sum_{i=1}^{N} v_i,\ A_{12}=A_{21}=\sum_{i=1}^{N} i=10,\ A_{22}=\sum_{i=1}^{N} i^2,\ A_{20}=\sum_{i=1}^{N} v_i i$.

Thus, task 1 should be solved in the following order.

1. Based on the initial data, calculate the values $A_{10}=\sum_{i=1}^{N} v_i,\ A_{22}=\sum_{i=1}^{N} i^2,$ $A_{20}=\sum_{i=1}^{N} v_i i$.

2. Compile the system of equations (1), (2) and find its solution α_0^0,α_1^0.

3. Write down the function $f[\alpha^0](\text{i})=f_1[\alpha^0](\text{i})$ and find the projected sales volume $v_5=v_{51}=f_1[\alpha^0](5)$ within 5th year.

4. Plot the graphs of the function $v(i)=v_i\ \ (i=1,2,...4)$ and of the function $f_1[\alpha^0](\text{i})\ \ (i=1,2,...4,5)$.

Example (option 0). $v_1=10,\ v_2=20,\ v_3=30,\ v_4=40;\ A_{10}=100,\ A_{22}=30,$ $A_{20}=300$.

$$4\alpha_0+10\alpha_1=100,$$

$$10\alpha_0+30\alpha_1=300,$$

From here $\alpha_0=25-2{,}5\alpha_1,\ 250-25\alpha_1+30\alpha_1=300,\ \alpha_1=10,\alpha_0=0;\ f_1[\alpha^0](\text{i})=10\text{i};$ $f_1[\alpha^0](5)=50$. According to this $f_1[\alpha^0](\text{i})=v(i)=v_i\ \ (i=1,2,...4)$.

Chapter 4. Forecasting of sales volume by the method of trend modeling with preliminary smoothing of the time series. Part 2 of the task.

Using the smoothing of the input time series using the moving average method, it is possible to partially eliminate the random component of the series, analyze the

smoothed curve and identify a regular trend — a trend in the form of one or another function.

To find the moving average, the averaging interval is chosen, that is, the number of points m, with the help of which the average value $\bar{v}_i$ of sales for the year i is determined. Usually m is chosen as an odd number, m = 2k + 1, where k is half the averaging interval. Then the values for all periods of the averaging interval are summed up, and the sum obtained is divided by the number of periods. The value $\bar{v}_i$ of the average ("smoothed") value of sales for the year i is calculated according to the formula:

$$\bar{v}_i = \frac{v_{i-k} + v_{i-k+1} + ... + v_i + ... + v_{i+k}}{m}.$$

If the averaging interval is 3, then $\bar{v}_i = \frac{v_{i-1} + v_i + v_{i+1}}{3}$. Since the time series of sales volumes in the task contains data for only 4 years, the average sales volumes can be determined only for the 2nd and 3rd years:

$$\bar{v}_2 = \frac{v_1 + v_2 + v_3}{3},\ \bar{v}_3 = \frac{v_2 + v_3 + v_4}{3}. \quad (3)$$

The values α_0^0, α_1^0 of the parameters α_0, α_1 of the function $f[\alpha^0](\mathrm{i}) = f_2[\alpha^0](\mathrm{i})$ are found from the condition that a straight line passes through the points $(\mathrm{i}=2,\ \bar{v}_2)$, $(\mathrm{i}=3,\ \bar{v}_3)$:

$$\alpha_0^0 + 2\alpha_1^0 = \bar{v}_2,\ \alpha_0^0 + 3\alpha_1^0 = \bar{v}_3. \quad (4)$$

Thus, part 2 of the task should be solved in the following order.

1. According to formulas (3), calculate the average sales volumes $\bar{v}_2$, $\bar{v}_3$.
2. Compose the system of equations (4) and find α_0^0, α_1^0.
3. Write down the function $f[\alpha^0](\mathrm{i}) = f_2[\alpha^0](\mathrm{i})$ and find the projected sales volume $v_5 = v_{52} = f_2[\alpha^0](5)$ for the 5th year.

Chapter 5. Comparative analysis of results.

After solving parts 1 and 2 of the task, graphs of the functions $v(i) = v_i$ $(i = 1,2,...4)$ $f[\alpha^0](\mathrm{i}) = f_1[\alpha^0](\mathrm{i})$ $(i = 1,2,...4,5)$ (for part of task 1) and $f[\alpha^0](\mathrm{i}) = f_2[\alpha^0](\mathrm{i})$ $(i = 1,2,...4,5)$ (for part of task 2) should be depicted in one picture.

Then you need to compare the graphs of the functions and the projected sales volumes for the 5th year (for part of the task 1) and (for part of the task 2).

If students do not have access to MS Excel, the task can be completed "manually" using a regular calculator.

Criteria for evaluating the current educational achievements of a student of higher education

According to the main provisions of ECTS, the assessment system should be understood as a set of methods (written, oral and practical tests, exams, projects, etc.) used in assessing the achievements of students, expected learning outcomes.

Successful assessment of learning outcomes is a prerequisite for the assignment of credits to a learner. Therefore, statements about the results of studying program components should always be accompanied by clear and appropriate assessment criteria for the assignment of credits. This makes it possible to state whether the learner has obtained the necessary knowledge, understanding, and competencies.

Monitoring and assessing the learner's success during the semester

The rating system for assessing the knowledge, skills, and abilities of learners provides for the assignment of grades for all forms of classes.

The verification and assessment of the learner's knowledge is carried out in the following forms:

1. Assessment of the learner's work during practical classes.

2. Conducting intermediate module control 1 "Understanding marketing management. Development and analysis of the company's portfolio strategy. Analysis and forecasting of demand"

3. Conducting intermediate module control 2 "Marketing planning at the business and functional levels. Tactical marketing management".

4. Assessment of the performance of an individual task.

Intermediate (modular) knowledge control involves identifying the level of mastery of the module lecture material by the applicant and the ability to apply it to solve practical tasks and is carried out in the form of written answers to theoretical questions and questions from practical classes.

The overall grade for the discipline is given on a 100-point scale according to the principle of scoring for individual control measures and is determined as the sum of the resulting grade from module controls 1 and 2 (0-20 points), the resulting grade for practical classes (0-20 points) and the grade for the individual task (0-60 points).

Table 2 - Distribution of points for assessing the applicant's performance

Modular test papers	Practical classes	IT	Sum
20	20	60	100

Assessment criteria are descriptions of what a learner is expected to do to demonstrate the achievement of a learning outcome.

The main conceptual provisions of the system for assessing students' knowledge and skills are:

1. Improving the quality of training and competitiveness of specialists by stimulating independent and systematic work of students during the academic semester, establishing constant feedback from teachers with each student and timely correction of his/her educational activities.

2. Increasing the objectivity of assessing students' knowledge occurs through control during the semester using a 100-point scale (Table 2). Grades are necessarily transferred to the national scale (with the state semester grade "excellent", "good", "satisfactory" or "unsatisfactory") and to the ECTS scale (A, B, C, D, E, FX, F).

Table 3 - Knowledge and skills assessment scale: national and ECTS

Rating assessment, points	ECTS assessment and its denotation	National assessment	Evaluation criteria	
			positive	negative
1	2	3	4	5
90-100	A	Perfectly	- Deep knowledge of the educational material of the module, contained in the main and	Answers to questions may contain minor inaccuracies.

			additional literary sources; - the ability to analyze the phenomena being studied, in their interrelation and development; - the ability to conduct theoretical calculations; - answers to questions are clear, concise, logically consistent; - the ability to solve complex practical problems..	
82-89	B	Good	- A deep level of knowledge in the volume of mandatory material provided for by the module; - the ability to give reasoned answers to questions and conduct theoretical calculations; - the ability to solve complex practical problems.	The answers to the questions contain some inaccuracies.;
75-81	C	Good	- Solid knowledge of the material being studied and its practical application; - the ability to give reasoned answers to questions and perform theoretical calculations;	- inability to use theoretical knowledge to solve complex practical problems.

			- the ability to solve practical problems.	
64-74	Д	Satisfactorily	- Knowledge of the basic fundamentals of the material being studied and their practical application; - ability to solve simple practical problems.	Inability to give reasoned answers to questions; - inability to analyze the presented material and perform calculations; - inability to solve complex practical problems.
60-63	E	Satisfactorily	- Knowledge of the basic fundamentals of the module material, - ability to solve the simplest practical problems.	Ignorance of individual (non-principled) issues from the module material; - inability to express an opinion consistently and with arguments; - inability to apply theoretical provisions when solving practical problems
35-59	FX (additional study required)	Unsatisfactorily	Additional study of the module material can be completed within the time frame provided for in the curriculum.	Ignorance of the basic fundamental provisions of the module's educational material; - significant errors in answering questions; - inability to solve simple practical problems.
1-34	F	Unsatisfactorily	-	- Complete lack of knowledge of a significant part of

	(re-study required)			the module's educational material; - significant errors in answering questions; - ignorance of basic fundamentals; - inability to navigate when solving simple practical problems

Assessment for each individual test is carried out according to the following criteria:

1) understanding, degree of mastery of the theory and methodology of the problems being considered;

2) familiarization with the recommended literature, as well as with modern literature on the issues being considered;

3) the ability to combine theory with practice when solving problems, conducting analysis when performing tasks assigned to independent work and tasks presented for consideration in the classroom;

4) logic, structure, style of teaching the material when speaking in the classroom, the ability to justify one's position, generalize information and draw conclusions.

Навчальне видання

Методичні рекомендації до самостійної роботи студентів з дисципліни

МАРКЕТИНГОВИЙ МЕНЕДЖМЕНТ

для здобувачів другого освітнього рівня освітньої програми «Маркетинг» спеціальності 075 Маркетинг

Укладач: ЗАРУБА Віктор Яковлевич

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