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MANAGEMENT OF INNOVATIVE ACTIVITY

METHODOLOGICAL RECOMMENDATIONS FOR SEMINARS OF FOREIGN STUDENTS ON SPECIALTY 8.12020101 “PHARMACY”

MINISTRY OF PUBLIC HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY

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Methodological recommendations for seminars of foreign students on specialty 8.12020101 “Pharmacy”

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Management of innovative activity as an educational discipline is intended to provide knowledge about effective formation and evaluation of innovative activity of the enterprise within the framework of a market economy, laying the foundations for students to study the organization, planning, functions and means of introducing innovations in the enterprise. It is intended to familiarize with the work of innovative structures of modern organizations and their documentary support. This knowledge helps students to benefit from new and innovative ideas and technological capabilities.

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THE CONTENT

Introduction

Today, the transition of the pharmaceutical industry of Ukraine to an innovative development model is necessary, which will increase the share of affordable domestic remedies in the pharmaceutical market of Ukraine. Management of innovative activity as an educational discipline is intended to provide knowledge about effective formation and evaluation of innovative activity of the enterprise within the framework of a market economy, laying the foundations for students to study the organization, planning, functions and means of introducing innovations in the enterprise. It is intended to familiarize with the work of innovative structures of modern organizations and their documentary support. Questions of the discipline are important for future specialists as they enable to master the theory and practice of managing innovations at the enterprise, master the strategy and tactics of innovation support of the enterprise, finding the best innovative solutions.

Teaching goal of a subject «Management of innovation activity» is learning future specialists to possess theoretical knowledge and practice of managing innovative activities of pharmaceutical enterprises and organizations of various forms of ownership to achieve technological and product leadership, to highlight the special significance of innovations in the field of the production of medicinal products and active pharmaceutical ingredients.

Basic goals of a subject «Management of innovation activity» is studying the main provisions of innovation activity, the peculiarities of conducting research and development work in pharmacy by the method of a competitive direction by innovative processes, stages of creation and implementation of an innovative project and mastering the methods of calculating its economic and social efficiency; principles of state policy in scientific and innovative activity, experience of venture business abroad.

Subject «Management of innovation activity» provides the following competency to a candidate:

integral:

the ability to solve typical and complex specialized problems and practical problems in professional pharmaceutical activity, applying the provisions, theories and methods of fundamental, chemical, technological, biomedical and socio-economic sciences; integrate knowledge and solve complex issues, formulate judgments for insufficient or limited information; to clearly and unequivocally communicate their findings and knowledge, reasonably to them, to a professional and non-professional audience;

general:

the ability to abstract thinking, analysis and synthesis; the ability to learn and to be modernly trained;

the ability to conduct research at the appropriate level;

professional:

- ✓ the ability to use in professional activity the knowledge of normative legal, legislative acts of Ukraine and recommendations of appropriate pharmaceutical practices;
- ✓ the ability to organize and carry out general and marketing management of assortment, commodity-innovation, price, marketing and communicative policies of the subjects of the pharmaceutical market on the basis of market research results and taking into account market processes in the national and international markets;
- ✓ the ability to analyze socio-economic processes in pharmacy, forms, methods and functions of the pharmaceutical supply system of the population and its components in world practice, indicators of need, efficiency and availability of pharmaceutical assistance in terms of medical insurance and reimbursement of the cost of medicines.

As a result of learning activities a Candidate has to

know:

- laws regulating the scientific, technical and innovation activities of the enterprise;
- the essence of the theory of cyclic development;
- the essence of the mechanisms of stimulation and financing of the scientific and innovation sphere;

- organizational forms of innovation activity;
- the basis of decision making theory in the field of innovation;
- methods of stimulating innovation activity;
- peculiarities of compilation and implementation of innovative projects;
- methods for calculating the effectiveness of innovative projects and identifying innovative risks;

be able to:

- based on the principles, levers, technologies of management of innovations, to carry out organizational modeling of innovative development of the enterprise (organization);
- to prepare the planned cost estimates for the renewal of production;
- based on current legislation and study of business plans of innovation and investment projects, to prepare tender documentation and to take part in project tenders;
- on the basis of marketing research, to manage the process of creation and introduction of innovations in the enterprise;
- to substantiate the optimal sources of financing of innovative activity of the enterprise;
- to carry out operational management of the implementation of innovative projects at the enterprise;
- to analyze projects of innovations in terms of technical and technological advantages;
- formulate principles and choose adequate justifications for innovative projects.

acquire:

- technologies for the collection of the necessary economic information, statistical data processing, work with the databases necessary for the management of innovation activities;
- analytical, statistical, calculative, economic and mathematical methods of evaluation and selection of innovative projects.

Module 1. MANAGEMENT OF INNOVATIVE ACTIVITY

Seminar 1

Topic: Theoretical foundations of management of innovative activity of the pharmaceutical company

THEORETICAL PART

The term "innovation" seems to derive from the Latin *novus*, which means new or young or novel. For most people "*to be innovative"* means to be creative and/or to make something new. Unfortunately there is no single accepted definition of the term *"innovation"*. For some people it means a new idea, for others it means an invention (a materialized new idea), for some it means a new product (a developed invention), for some others it means the act of creating a new product or process, while for others it means to create a new business. One example of a definition that only covers the introduction of new ideas, services and practices on the market is from Wikipedia: "innovation is the introduction of new ideas, goods, services, and practices which are intended to be useful (though a number of unsuccessful innovations can be found throughout history). The main driver for innovation is often the courage and energy to better the world. An essential element for innovation is its application in a commercially successful way. Innovation has punctuated and changed human history (consider the development of electricity, steam engines, motor vehicles, et).

Many innovations can be protected through intellectual property (IP) rights. Without intellectual property protection there is a strong risk that investments in R&D, product differentiation and marketing may be stolen/copied. Intellectual

property rights enable enterprises to have exclusivity over the exploitation of their innovative new or original products, their creative designs and their brands.

Innovation includes many research, technological, organizational, financial and commercial activities.

Product innovation. A good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user friendliness or other functional characteristics.

Process innovation. A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

Marketing innovation. A new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

Organisational innovation. A new organisational method in business practices, workplace organisation or external relations.

Closed innovation requires control. *Open innovation:* companies use external as well as internal ideas and both external and internal ways to market; internal ideas can be taken to the market through external channels to generate additional value.

An innovation starts as an idea/concept that is evaluated, refined and developed before it is applied or acted upon.

Innovations may be inspired by reality (known problem). The innovation (new or improved product development) process, which leads to useful technology, requires: research; development (up-scaling, testing); production; marketing; sale; use/consume.

Experience with a product results in feedback and leads to incrementally or radically improved innovations.

PRACTICAL PART

Task 1

How to classify newness and degree of innovation and what to focus on:

New to the firm?

First in the market?

First in the world?

Incremental or radical innovations?

Task 2

Understanding the Process of Innovation: complete a form (Idea / Concept, Seed, Start-Up, Expansion, Pre-IPO)

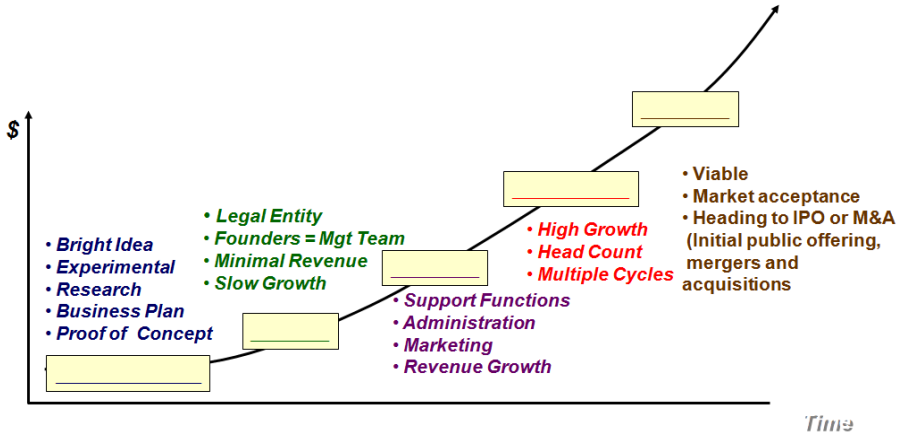

Figure 1. The Process/Steps of Innovation

Task 3

For each of the following critical ingredients for innovation summarize main principles:

✓ Intellectual Capital

- ✓ Human Capital
- ✓ Financial Capital
- ✓ Proximity
- ✓ Social Network Capital

Task 4

Summarize the information of innovation in the table 1.

Table 1

Title of the invention	№ of patent	Country of patent protection	1. Data of the filing application 2. Expire date of the patent	Applicant (s), country	Object of the invention	Drug group of anatomic therapeutic classification *

*- if the object of the invention is a drug

Innovation:

Bibliographic data	UA 82828 The use of enantiomeric pure escitalopram for treatment of depression
Publication date:	2008-05-26
Inventor(s):	SANCHEZ CONNIE [DK]; MOERK ARNE [DK]
Applicant(s):	LUNDBECK & CO AS H [DK]
Application number:	UA20030098415 20020501
Abstract	The present invention relates to the use of enantiomeric pure escitalopram and/or of low dose medicaments thereof for the improved treatment of depression, in particular major depression disorder, neurotic disorders, acute stress disorder, eating disorders such as bulimia, anorexia and obesity, phobias, dysthymia, pre-menstrual syndrome, cognitive disorders, impulse control disorders, attention deficit hyperactivity disorder or drug abuse. The medicaments may also be used in the treatment of major depression disorder in "treatment resitant" patients

Bibliographic data	AU 2004278158 Imidazopyridine substituted tropane derivatives with CCR5 receptor antagonist activity for the treatment of HIV and inflammation
Publication date:	2005-04-14
Inventor(s):	STUPPLE PAUL ANTHONY
Applicant(s):	PFIZER
Application number:	AU20040278158 20040928
Abstract	The present invention provides compounds of formula (I). The compounds

	of the present invention are modulators, especially antagonists, of the activity of chemokine CCR5 receptors. Modulators of the CCR5 receptor may be useful in the treatment of various inflammatory diseases and conditions, and in the treatment of infection by HIV and genetically related retroviruses

Bibliographic data	US 2009227640 Heterocyclic compounds with carboxyl isostere groups and their use for the treatment of cardiovascular diseases
Publication date:	2009-09-10
Inventor(s):	BARTEL STEPHAN [DE]; HAHN MICHAEL [DE]; MORADI WAHED AHMED [DE]; MUENTER KLAUS [DE]; ROELLE THOMAS [DE]; STASCH JOHANNES-PETER [DE]; SCHLEMMER KARL-HEINZ [DE]; WUNDER FRANK [DE]
Applicant(s):	BAYER HEALTHCARE AG [DE]
Application number:	US20060083760 20061009
Abstract	The present application relates to novel heterocyclic compounds, processes for their preparation, their use for the treatment and/or prophylaxis of diseases, and their use for producing medicaments for the treatment and/or prophylaxis of diseases, especially for the treatment and/or prevention of cardiovascular disorders

Bibliographic data	ZA 200800054 Heteroaryl benzamide derivatives for use as GLK activators in the treatment of diabetes
Publication date:	2009-07-29
Inventor(s):	DARREN MCKERRECHER; JAMES WARING MICHAEL; GORDON PIKE KURT
Applicant(s):	ASTRAZENECA AB
Application number:	ZA20080000054 20080102
Bibliographic data	HK 1077534 USE OF N-(3-METHOXY-5-METHYLPYRAZIN-2-YL)-2-(4-[1,3,4-OXADIAZOL-2- YL]PHENYL)PYRIDINE-3-SULPHONAMIDE IN THE TREATMENT OF CANCER
Publication date:	2009-09-11
Inventor(s):	TONGE DAVID WILLIAM; TAYLOR SIAN TOMIKO; BOYLE FRANCIS THOMAS; HUGHES ANDREW MARK; JOHNSTONE DONNA; ASHFORD MARIANNE BERNICE; BARRASS NIGEL CHARLES
Applicant(s):	ASTRAZENECA AB [SE]

Task 5

For each of the following intellectual property examples state the area of IP law that would be most appropriate for their protection:

1) A company wishes to ensure that no-one else can use their logo.

2) A singer wishes to assign the rights to reproduce a video she made of her concert.

3) A new way to process milk so that there is no fat in any cheese made from it.

4) A company has decided to invest in packaging, which is distinctive, and they wish to ensure that they have sole use.

Answer: Industrial Design, Patent, Trademark, Related Rights

Question for self control

1. The urgency of innovation activity to ensure the competitiveness of the pharmaceutical company.
2. The essence of innovation and innovation of the enterprise. Classification of innovations in pharmacy.
3. Functions of management of innovative activity.
4. Regulatory of innovation activity.

Seminar 2

Topic: Planning and organizational support for the pharmaceutical company's innovation activities

THEORETICAL PART

The first step of your innovation plan is to state the goal or problem. Once the goal is stated, you should also consider several other issues:

Participants: Who will participate in your innovation plan? Can you solicit ideas from the entire organization or will you be restricted to a specific project team? Who can you call upon for evaluation and pre-implementation?

Budget: What is the budget for capturing and developing this idea?

Resources: What resources will be available for capturing and developing this idea? What tools do you need? Can you hire facilitators or an ideas campaign tool? Can you hire facilities for brainstorming? What internal resources will be available to you?

Timeframe: How much time do you have to capture and develop your ideas.

Reward(s): are you offering any rewards for ideas? You might want to offer a small reward for the best ideas. One well known company offers small cash rewards and dinner coupons to people who contribute exceptional ideas. Others offer gifts, points or recognition. If you are working with a relatively small team, you might consider rewarding the entire team at the completion of the product or at major milestones if the project is long-term.

Characteristics of successful innovating companies:

- ✓ Systematic collection of all impulses that could lead to innovation
- ✓ Creativity of employees
- ✓ Ability to evaluate the possibility of the innovation idea
- ✓ Good team work
- ✓ Project-based approach and ability to manage projects
- ✓ Cooperation with external experts (universities, research laboratories…)
- ✓ Proper rate of risk-taking
- ✓ Employees' motivation (the employees are willing to improve the product and the operation of the whole company)
- ✓ Continued education of employees
- ✓ Ability to finance the innovation activities

What is Corporate Strategy?

- ✓ A defining statement containing the intent and direction of the corporation, & delineating the strategic plans to achieve its objective.
- ✓ A *living* guideline, that focuses and directs efforts of the corporation.
- ✓ Constantly tested and modified as required.
- ✓ Not to be circumvented without deliberate modification.

Balances and integrates the following elements:

- ✓ Vision of strategic direction for long-term strength
- ✓ Market direction and needs
- ✓ Competitive effects
- ✓ Technology strategy
- ✓ Product strategy

- ✓ Core competency
- ✓ Resource alignment

An Aspect of Good Management

✓ People Management – because IP is generated by people and used by people.

✓ Knowledge Management – because a lot of knowledge is informal and may or may not crystallise as recognisable category of IP.

✓ IT Strategic Planning – because a lot of IP is IT-related; some of the ore complex IP issues arise in IT context.

✓ Contract Management – because IP is often created (or improved) in context of a contract (eg, supply contract or joint venture relationship).

✓ Asset Management – because IP is an asset, albeit intangible; it has a value.

✓ Risk Management – because there are risks to an organisation flowing from its actions, or failure to act, in relation to intellectual property (IP) (including risk of lost opportunity).

IP Strategy should be an integral part of the overall business strategy of an Enterprise. The IP strategy of an Enterprise is influenced by its creative/innovative capacity, financial resources, field of technology, competitive environment, etc. BUT: Ignoring the IP system altogether is in itself an IP strategy, which may eventually prove very costly or even fatal.

Recommendations:

- ✓ Solve the correct problem correctly – be effective and efficient
- ✓ Manage innovation as a project
- ✓ Analyze risks
- ✓ Use models, scenarios, computer simulation
- ✓ Study examples of succesful and unsuccesful innovation projects

A company with high innovation potential scores high in the following areas:

- ✓ Strategy and planning
- ✓ Marketing
- ✓ Technological process
- ✓ Quality management

- ✓ Logistics
- ✓ Human resources

PRACTICAL PART

Task 1

Summarize the information of pharmaceutical company in the table 2.

Table 2

Company innovation potential

Component	Characteristics
1	2
STRATEGY AND PLANNING	1. Idea about the company future 2. Vision and employees 3. Company innovation programs 4. Plan modifications 5. Financial indicators of the plan 6. Project management
MARKETING	1. Monitoring of current market trends 2. Evaluation of the market competition position 3. Customer-orientation 4. Monitoring of customers' attitudes to the company product 5. Market information flow inside the company 6. Marketing and financial control
TECHNOLOGICAL PROCESS	1. Future company's competitiveness in the industry 2. Changes of technologies 3. Collection of impulses for implementation of technology changes 4. Evaluation of the return on investment 5. Calculation of production costs and their monitoring 6. Creation of resources for development
QUALITY, ENVIRONMENT	1. Monitoring of changes conditioning the quality management in the company 2. Employees' personal contribution to the quality system 3. External quality audit in the company 4. Monitoring of the environmental impact 5. Impact of quality monitoring on the company processes 6. Covering of costs resulting from modifications of standards, regulations and legislation in the sphere of quality and environment

1	2
LOGISTICS	1. Organization of purchase and distribution channels in the company 2. Optimization of the company logistics 3. Information and communication flows between the company and its partners 4. Flexibility of logistics processes 5. Introduction of innovations in logistics 6. Logistics and financial control
ORGANIZATION AND HUMAN RESOURCES	1. Employees satisfaction 2. Employees motivation 3. Management and communication 4. Conflict resolution 5. Company information system 6. Company culture

Task 2

Complete a table 3.

Table 3

Alternative Strategies for Exploiting Innovation

	Licensing	Outsourcing certain functions	Strategic Alliance	Joint Venture	Internal Commercialization
Risk & Return	Small risk, but limited returns also (unless patent position very strong	Limits investment, but dependence on suppliers & partners	Benefits of flexibility; risks of informal structure	Shares investment & risk. Risk of partner conflict & culture clash	Biggest risks & benefits. Allows complete control
Competing Resources	Few	Allows outside resources & capabilities To be accessed	Permits pooling of the resources/capabilities of more than one firm	Permits pooling of the resources/capabilities of more than one firm	Substantial resource requirements
Examples					

Task 3

Read a patent and write bibliographic information**:**

- ✓ title
- ✓ inventor
- ✓ applicant
- ✓ application №

- ✓ serial № of the patent
- ✓ date of application
- ✓ priority date
- ✓ country of publication
- ✓ priority number
- ✓ priority country.

Task 4

Read a patent and find technical information:

- ✓ object of invention
- ✓ the problem one is getting to solve
- ✓ prior art
- ✓ how others have approached the issue or related issues
- ✓ references are made to the entire "public knowledge domain", including patents, scientific literature,
- ✓ prior use, sale publicity brochures, news, items etc.
- ✓ disclose/ describe invention, approach and what is the solution
- ✓ examples to illustrate working of the invention so that anyone trained in the art can repeat the invention
- ✓ claims defining the monopoly
- ✓ determine the protection boundaries of the invention

Write the abstract for the invention.

Question for self control

1. Essence of planning of innovation activity.
2. Innovative organizational structures and their classification.
3. Organizational construction of an innovative organization.
4. Essence and classification of innovative risks.

Seminar 3

Topic: Financial support and expenses for the implementation of innovation activities

THEORETICAL PART

Every innovation project has to be financed either totally before the start of the project or step by step when the project develops. To *finance* an operation means to acquire *liquid assets* (i.e. money) in order to be able to pay current or future debts for running a business, and in order to be able to finance (i.e. pay for) planned development and investments. Also some unplanned costs must be prepared for which can differ depending on e.g. maturity of the business, branch, etc. The principles of financing are the same regardless of whether we are talking about a company, a public body, an organization or a household. When speaking of a company's or a person's *financial strength* one means their capacity to finance their own or other operations. Financial strength in turn is dependent on how liquid the company or person is, i.e. how good the capability is to obtain liquid assets at short notice.

Internal financing or *self financing* means converting one's own assets and reserves into capital that can be used as payment or to use the assets directly as payment or in a transaction where the official valuation varies depending on the purpose of the valuation. A patent or brand name can be assigned great value, for example if the company wishes to show large intangible assets. Especially if the company pays with a new share issue, this can be attractive to the inventor or owner of the rights.

External financing means acquiring capital principally through borrowing or through a new issue of shares when the operation to be financed is in a limited company. In external financing the *financier* normally wants to gain an overview of the value of the business as well as its financial resources after external financing. If the financier is not familiar with the business, then before financing the financier will often want to ensure that the capital made available is not dropped into a "black hole", or is not used in an unintended way in order to achieve increased value in the

company. The financier therefore takes security measures. A term for such activities is to make "*due diligence*". Examples of security a financier makes are: to demand a mortgage in the company, to demand a guarantee of some sort from the shareholders, to demand representation on the board, to demand an agreement that the company does not take different actions without the consent of the financier, etc. To arrange external financing therefore always takes time and for this reason must be planned in good time to avoid a crisis situation due to a lack of liquidity.

Among the assets, one differentiates between fixed assets and current assets. *Fixed assets* are for example equipment, machines, buildings, and land. For knowledge-based companies the fixed assets are minimal and it is usually said that the company instead has extensive *human capital*, which is difficult to evaluate in ordinary financial terms. *Current assets*, which are sometimes referred to as *floating assets*, are for example liquid assets, inventory and receivables. Financing consists of shareholders' equity and debts. The shareholders' equity consists of the owners' investments and prior liabilities that have not been distributed. The *liabilities* include bank loans, and trade accounts payable, payroll and taxes liabilities. In order to try to gain an impression of how profitable a company is, it is common to use different forms of key ratio. This is called to carry out an *accounts analysis*, i.e. to make an analysis of the balance sheet in the latest annual report. The key ratio most often used is liquidity – to which we will pay great attention further on, *profitability*, which gives an idea of the company's ability to provide a return on invested capital and the *equity/assets* ratio, which indicates the company's ability to absorb losses.

PRACTICAL PART

Task 1

A pharmaceutical company has 100 000 euros on application of the achievements of science to production. A pharmaceutical company has 10 innovative projects, which are protected by patents for inventions:

1. Immunomodulating suppository on the basis of extract of placenta.
2. Emulsion for treatment of dermatological diseases.
3. Plant hepatoprotector in the liposome form (glycyrrhiza)

4. Tablets containing glibenclamide for sustained release (antidiabetic active).

5. Eye drops of anti-allergic action.

6. Tablets for treatment of osteoporosis containing vitamin D and calcium.

7. Aerosol for treatment of bronchial asthma.

8. Pharmaceutical composition for treatment of anaemia in the form of capsules.

9. Antineoplastic drug in the form of liposome.

10. Tablets for treatment of illnesses of joints (chondroitin sulfate).

Choose most perspective innovative projects for this pharmaceutical company. How many projects have you got ?

1. Calculate total costs of R&D (research and development) work on every project P_i.

2. Calculate total value of R&D (research and development) work on the every project V_i (use marks of experts).

Costs of R&D (research and development) work

N	Costs (euros)	N of innovative projects									
		1	2	3	4	5	6	7	8	9	10
1	Materials	4600	0	4000	500	3000	3000	300	2500	3500	3000
2	Equipment	7000	0	6000	0	700	2000	200	1500	0	7000
3	Wage cost	5000	3500	4500	1500	4000	3500	1500	5500	4000	4000
4	Extra pay (10 % from N 3)										
5	Social insurance (50 % from N 3)										
6	Travel allowance	1000	300	1000	300	500	1000	300	1000	800	1500
7	Outside service	6000	0	4700	0	0	5000	0	4000	2000	4500
8	Cost for force majeur (10 % from N 3)										
9	Unscheduled cost	500	300	500	200	400	500	200	400	300	500
10	Overhead expenses (100 % from N 3)										
	In all $\sum$	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}

Marks of experts

	Criteria and activities	Value of activities	Numbers of innovative projects									
			1	2	3	4	5	6	7	8	9	10
1	**Level of planning of R&D (research and development) (criterion weight– 15)**											
	A) government regulation	**5**								**X**		**X**
	B) complex scientific and technical programs	**4**	**X**								**X**	
	C) plans of medical industry	**3**		**X**					**X**			
	D) plans of enterprises	**2**			**X**		**X**					
	E) initiative work (idea)	**1**				**X**		**X**				
2	**Profit (criterion weight– 10)**											
	A) > 5000 euro	**5**	**X**			**X**		**X**				
	B) 1000-5000 euro	**3**		**X**			**X**		**X**		**X**	**X**
	C) 0-1000 euro	**2**			**X**					**X**		
3	**Economic efficiency (criterion weight– 10)**											
	A) > 50	**4**	**X**				**X**					
	B) 50	**3**				**X**						**X**
	C) 30	**2**		**X**				**X**		**X**	**X**	
	D) 10	**1**			**X**				**X**			
4.	**Time of implementation (criterion weight–10)**											
	A) 3 years	**2**	**X**			**X**					**X**	
	B) 2 years	**3,5**			**X**		**X**		**X**	**X**		
	C) 1 years	**4,5**		**X**				**X**				**X**
5.	**Scientific result of R&D (criterion weight– 10)**											
	A) licenses	**3**						**X**				
	B) patents	**2**					**X**					
	C) monographs and other publications	**2**	**X**							**X**		
	D) training of specialists	**3**			**X**						**X**	
	E) exhibits of exhibitions	**0,5**		**X**		**X**						
6.	**Techno-economic activities of manufacture (criterion weight– 10)**											
	A) increase of the productivity of enterprise	**2**							**X**			
	B) reduction of unit cost	**2**		**X**				**X**				**X**
	C) increase of the labour productivity	**2**	**X**								**X**	
	D) improving production	**2**			**X**						**X**	
	E) protection of environment	**2**				**X**	**X**			**X**		
7	**Scientific and technical level of development (criterion weight– 10)**											
	A) difficult innovative product	**6**	**X**	**X**	**X**	**X**		**X**	**X**	**X**	**X**	
	B) modifications of products	**4**					**X**					**X**
	In all $\sum$		V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}

3. Calculate effectiveness of R&D (research and development) work on the every project E_i :

$$E_i = \frac{V_i}{P_i}$$

4. Write down projects in order of decreasing their effectiveness (from the most effective to less effectiveness)

5. Choose more effective innovative projects. Costs on these projects are equal to only 100 000 euros.

Task 2

Stages of venture financing:

1. Seed Money. Low level financing needed to prove a new idea.

2. Start-up. Early stage firms that need funding for expenses associated with marketing and product development.

3. First-Round. Early sales and manufacturing funds.

4. Second-Round. Working capital for early stage companies that are selling product, but not yet turning a profit .

5. Third-Round: Also called Mezzanine financing, this is expansion money for a newly profitable company

6. Fourth-Round. Also called bridge financing, it is intended to finance the "going public" process

Complete a table 4.

Table 4

Risks in each stage of venture financing

Financial Stage	Period (Funds locked in years)	Risk Perception (extreme, high, low, medium, sufficiently high, very high)	Activity to be financed
Seed Money	7-10		For supporting a concept or idea or R&D for product development
Start Up	5-9		Initializing operations or developing prototypes
First Stage	3-7		Start commercials production and marketing
Second Stage	3-5		Expand market and growing working capital need
Third Stage	1-3		Market expansion, acquisition & product development for profit making company
Fourth Stage	1-3		Facilitating public issue

Task 3.

1. What is a business incubator?

   A. It is a business that provides advice, equipment, temporary premises, or other facilities to those starting up a business and lacking in capital;

   B. cluster;

   C. IP department;

   D. private or institutional investment (capital) in relatively early-stage companies.

2. What is a cluster?

   A. It is a business that provides advice, equipment, temporary premises, or other facilities to those starting up a business and lacking in capital;

   B. geographical concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate;

   C. IP department;

   D. private or institutional investment (capital) in relatively early-stage companies.

3. What is venture capital?

   A. It is a business that provides advice, equipment, temporary premises, or other facilities to those starting up a business and lacking in capital;

   B. geographical concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate;

   C. IP department;

   D. private or institutional investment (capital) in relatively early-stage companies

4. Definition of “business angel”:

   A. typically a division of a large technology company;

   B. individuals who use their personal wealth to provide capital to start-up and early-stage businesses in return for a share of the company’s equity;

   C. geographical concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate

D. IP department.

5. What is a exclusive license ?

   A. a license in which the same rights to an intellectual property granted to several licensees within the same scope or field, consecutively or simultaneously;

   B. no person or company other than the named licensee can exploit the relevant intellectual property rights;

   C. only the licensee and the licensor can use it to the exclusion of any other third party;

   D. a license or contract granted to a third party by a licensee for specified rights or uses of a product, brand name, logo, etc.

6. What is non-exclusive license ?

   A. a license in which the same rights to an intellectual property granted to several licensees within the same scope or field, consecutively or simultaneously;

   B. no person or company other than the named licensee can exploit the relevant intellectual property rights;

   C. only the licensee and the licensor can use it to the exclusion of any other third party;

   D. a license or contract granted to a third party by a licensee for specified rights or uses of a product, brand name, logo, etc.

7. What is sole license ?

   A. a license in which the same rights to an intellectual property granted to several licensees within the same scope or field, consecutively or simultaneously;

   B. no person or company other than the named licensee can exploit the relevant intellectual property rights;

   C. only the licensee and the licensor can use it to the exclusion of any other third party;

   D. a license or contract granted to a third party by a licensee for specified rights or uses of a product, brand name, logo, etc.

8. What is sub-license?

   A. a license in which the same rights to an intellectual property granted to several

licensees within the same scope or field, consecutively or simultaneously;

B. no person or company other than the named licensee can exploit the relevant intellectual property rights;

C. only the licensee and the licensor can use it to the exclusion of any other third party;

D. a license or contract granted to a third party by a licensee for specified rights or uses of a product, brand name, logo, etc.

9. Who is licencee?

A. a person, company, etc., to whom a license is granted or issued;

B. a person or organization who gives another person or organization official permission to make, do, or own something;

C. typically a division of a large technology company;

D. individuals who use their personal wealth to provide capital to start-up and early-stage businesses in return for a share of the company’s equity.

10 Who is licensor?

A. a person, company, etc., to whom a license is granted or issued;

B. a person or organization who gives another person or organization official permission to make, do, or own something;

C. typically a division of a large technology company;

D. individuals who use their personal wealth to provide capital to start-up and early-stage businesses in return for a share of the company’s equity.

11 SWOT analysis is a process that identifies

A. organization's strengths;

B. organization's weaknesses;

C. organization's opportunities and threats;

D. all of the above.

12 What is intellectual capital?

A. human capital;

B. intellectual property;

C. relational capital;

D. all of the above.

Question for self control

1. Classification of sources of financing for innovation activities.
2. Forms of indirect financing of innovation activity.
3. Venture capital and venture entrepreneurship.
4. Composition and structure of innovation costs.

Seminar 4

Topic: Innovative projects and evaluation of innovation effectiveness

THEORETICAL PART

In finance, the **net present value** (**NPV**) is a measurement of profit. A cash flow today is more valuable than an identical cash flow in the future because a present flow can be invested immediately and begin earning returns, while a future flow cannot. Net present value (NPV) is determined by calculating the costs (negative cash flows) and benefits (positive cash flows) for each period of an investment. The period is typically one year, but could be measured in quarter-years, half-years or months. After the cash flow for each period is calculated, the present value (PV) of each one is achieved by discounting its future value at a periodic rate of return (the rate of return dictated by the market). A positive NPV results in profit, while a negative NPV results in a loss.

If...	It means...	Then...
NPV > 0	the investment would add value to the firm	the project may be accepted
NPV < 0	the investment would subtract value from the firm	the project may be rejected
NPV = 0	the investment would neither gain nor lose value for the firm	We should be indifferent in the decision whether to accept or reject the project. This project adds no monetary value. Decision should be based on other criteria, e.g., strategic positioning or other factors not explicitly included in the calculation.

$$\mathbf{NPV= \sum PVxK - \sum ICxK}$$

NPV – net present value
IC – invest capital
PV – present values
K= $1/ (1+ i)^t$ coefficient of discounting
T -the time of the cash flow
i - the discount rate
If NPV > 0 then accept the project
If NPV < 0 then reject the project

Profitability index (**PI**), also known as **profit investment ratio** (**PIR**) and **value investment ratio** (**VIR**), is the ratio of payoff to investment of a proposed project. It is a useful tool for ranking projects because it allows you to quantify the amount of value created per unit of investment.

Assuming that the cash flow calculated does not include the investment made in the project, a profitability index of 1 indicates breakeven. Any value lower than one would indicate that the project's present value (PV) is less than the initial investment. As the value of the profitability index increases, so does the financial attractiveness of the proposed project.

$$\mathbf{PI=PV/IC}$$

Rules for selection or rejection of a project:

- If PI > 1 then accept the project
- If PI < 1 then reject the project

Payback period: the amount of time required for an investment to generate after-tax cash flows sufficient to recover its initial cost. Decision rule: an investment is accepted (rejected), if payback period < (>) some specified number of time period.

SWOT analysis (or **SWOT matrix**) is a strategic planning technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning. It is intended to specify the objectives of the business venture or project and identify the internal and external factors that are favorable and unfavorable to achieving those objectives. Users of a SWOT analysis often ask and answer questions to generate meaningful information for each category to make the tool useful and identify their competitive advantage. SWOT has been described as the tried-and-true tool of strategic analysis. Strengths

and weakness are frequently internally-related, while opportunities and threats commonly focus on the external environment. The name is an acronym for the four parameters the technique examines:

- Strengths: characteristics of the business or project that give it an advantage over others.
- Weaknesses: characteristics of the business that place the business or project at a disadvantage relative to others.
- Opportunities: elements in the environment that the business or project could exploit to its advantage.
- Threats: elements in the environment that could cause trouble for the business or project.

PRACTICAL PART

Task 1

Choose the best innovative project.

Innovation project	PV – present values, m$	IC – invest capital, m$
1	446,5	640,2
2	750,6	977,5
3	1250,0	1475,5

Task 2

Choose the best innovative project. Invest capital – 8000, m$ (0 year); the discount rate – 18 %

Years	PV, m$	
	Innovation project 1	Innovation project 2
1	3000	6000
2	4000	4000
3	5000	5000
4	6000	3000

Task 3

Choose the best innovative project.

	Innovation project 1 the discount rate – 10%	Innovation project 2 the discount rate – 12%
Invest capital, m$, 0 year	7 000	6 700
Present values, m$, 1 year	6 000	2 000
Present values, m$, 2 year	4 000	3 000
Present values, m$, 3 year	–	3 000
Present values, m$, 4 year	–	3 000

Task 4

Choose the best innovative project

	project A	project B	K (10%)
IC – invest capital, m$ (t=0)	50	50	
PV – present values, m$			
1 year	25	10	0,909
2 year	20	10	0,826
3 year	15	24	0,751
4 year	20	36	0,683

Task 5

Choose the best innovative project

Years	PV – present values, m$	IC – invest capital, m$	K (16%)
0		120	
1	30% of 62	70	0,862
2	50% of 62		0,743
3	70% of 62		0,641
4	90% of 62		0,552
5	62		0,476
6	62		0,410
7	62		0,354
8	62		0,305

Question for self control

1. Understanding and essence of the innovation project.
2. Procedure for development and implementation of the innovation project.
3. Analysis and selection of innovative projects.
4. Effect and effectiveness of innovation.
5. Methods of evaluating the effectiveness of innovative projects.

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MANAGEMENT OF INNOVATIVE ACTIVITY

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