ENEX Innovation Management

Lesson plans ver. 1

February, 2016, Faculty of Management

Co-funded by the I Erasmus+ Programme of the European Union

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Introduction

Part II (Innovation Management) of the ENEX curriculum focuses on innovation processes and will impart knowledge that is necessary to understand, assess and manage the R2M process in the area of nanotechnology.

The lesson plans consider the results of the online survey and interviews carried out within ENEX project with entities from ENEX target groups.

The lessons provide a systematic view of peculiarities of the NT innovation process from idea to market describing the most critical phases and typical innovation barriers. Special attention is given to the very early stage of the innovation process that is commonly understood as being the root of success for any company to compete on the basis of innovation. The course aims to provide methodological knowhow and appropriate problem solving techniques that help manage the innovation process. Starting with the early stage of innovation (market research, idea generation, product strategy, concept development, IPR etc.) the course guides the ENEX trainee through the development phase (e.g. product design, development etc.) to the commercialization process (certification, licensing, marketing etc.). Success stories are used to map and discuss the value chain from idea to market and demonstrate the relevant phases of the R2M process.

Course modules

The course is divided into 6 modules.

List of Modules:

Module10 - Technology commercialization fundamentals. (12 hours)

Module 11 - Assessment of market value of the knowledge/technology. (10 hours)

Module 12 - Innovation marketing. (12 hours)

Module 13 - Technology development project management. (20 hours)

Module 14 - Financing of technology commercialization and transfer. (8 hours)

Module 14 - Corporate and academic entrepreneurship (intrapreneurship). (8 hours)

Modules description

Modules content:

Module10. Technology commercialization fundamentals. (12 hours)

- Development of the competitive advantage of modern enterprise - the importance of scientific research and their transfer to business practice.
- Key components of the concept of commercialization. Process models for commercialization, the stages of the commercialization process
- Determinants of choice of strategy in the commercialization process.
- Key areas of decision-making in the commercialization of research results.
- Key strategies and tactics for commercialization.
- Managerial competencies in the area of technology commercialisation.

Module 11. Assessment of market value of the knowledge/technology. (10 hours)

- Identification and analysis of ideas / technologies with commercialization / market potential.
- Technology readiness levels.
- Commercialization / market potential analysis approaches.
- Key competences and key areas of activity of commercialization manager.
- Presenting the outcomes of assessment of the economic value.

Module 12. Innovation marketing. (12 hours)

- Product innovation - sources, idea selection, development.
- Sources of market information.
- Identification of the qualitative characteristics of the product and its place in the chain.
- Business environment analysis, incl. SWOT, PEST, marketing mix.
- New product market testing

Module 13. Technology development project management. (20 hours)

- Stakeholders / benefits matrix.
- Business planning.
- Business modelling - Business model Canvas.
- Commercialization plan.
- Presentation of technology for stakeholders.
- Technology and product development management projects – structure, stages and management techniques.

Module 14. Financing of technology commercialization and transfer. (8 hours)

- Economics of innovation - selected issues related to financing innovation.
- Knowledge and technology pricing.
- Stages of product development and innovation funding
- Sources of finance related to technology commercialization. Characteristics of equity financing.

Module 15. Corporate and academic entrepreneurship (intrapreneurship). (8 hours)

- Intrapreneurship and invention generation and technology development. Spin off.
- Academic entrepreneurship. University context of new technology commercialisation.
- Corporate entrepreneurship – entrepreneurial technology commercialisation within large companies

Please note: Cases of NT success stories will be embedded into each module – no separate case study module

Innovation Management

ver.1 modules

MODULE 10

Technology commercialization fundamentals

Study load: 12 hours

Description of the module

The aim of the module is to present the overall context of the commercialization of research results, their importance for enterprises and sectors relevant to the development of the economy. The main areas covered by module are as follows:

1. Development of the competitive advantage of modern enterprise - the importance of scientific research and their transfer to business practice.
2. Key components of the concept of commercialization. Process models for commercialization of research, the stages of the commercialization process
3. Determinants of choice of strategy in the commercialization of research.
4. Key areas of decision-making in the commercialization of research results (to commercialize or not, how to protect, with what sources of finance, how to market).
5. Key strategies and tactics for commercialization (licensing, independent deployment, interoperability). The strategic partnership of companies and research institutions in the process of commercialization.
6. Managerial competencies in the area of technology commercialisation.

Learning outcomes

After following this module, the trainee (is able to):

1. Knows the process of commercialization and identifies key areas of decision-making in the process.
2. Holistically looks at the process of commercialization and understand key elements both from the point of view of a scientist and businesses.
3. Knows the strategies and tactics used in the process of commercialization of research results and the conditions of their choice.
4. Is able to identify the essential characteristics of the market, industry or sector

Course materials

- PowerPoint presentations cover main topics
- Youtube/presentation: commercialization models of research results and the transfer of knowledge and technologies in the biotechnology (Polish)
- Case: Novasome company
- Self-testing quiz

MODULE 11

Assessment of market value of the knowledge/technology

Study load: 10 hours

Description of the module

The module is delivered to trainees to allow them to gain knowledge and skills necessary to assess the economic value of the results of scientific research. The main areas covered by module are as follows:

1. Introduction to economic value assessment. The process, components and types. Technology readiness level.
2. The criteria for determining the economic value of the results of scientific research. The context and specific factors related to scientific research outcomes.
3. Valuation of the results of research and development projects.
4. Key competences and key areas of activity of commercialization manager.
5. Presenting the outcomes of assessment of the economic value.

Learning outcomes

After following this module, the trainee (is able to):

1. Knows the process of assessing the economic value.
2. Knows the rules for creating offers based on the results of research outcomes.

3. Knows the rules of the development of the research results.
4. It has knowledge about the assessment of the value of innovation at the company level as well as at the regional level.
5. Know and understand the basic concepts and principles of the protection of industrial property and copyright law as well as methods for assessing the economic value of IP
6. Knows the possibility of a holistic view of activities in the transfer of research results to industry.
7. Understand the business reporting in relation to the economic value of research results

Course materials

- PowerPoint presentations cover main topics
- Cases containing descriptions of scientific research outcomes, which provides base to train assessment skills.
- Self-testing quiz

MODULE 12

Innovation marketing

Study load: 12 hours

Description of the module

The aim of the module is to provide the knowledge about marketing activities related to the product in the different stages of its development. Particular attention is paid to increase understanding interconnection between technology development process and market issues. The main areas covered by module are as follows:

1. Market analysis. Sources of market information.
2. The structure of the product and its quality characteristics from the point of view of the supplier and the user
3. Identification of the qualitative characteristics of the product and its place in the chain.
4. Marking products
5. Product Lifecycle Management
6. The process of buying within organizations
7. Development of the product innovation. New product market testing
8. Innovation promotion

Learning outcomes

After following this module, the trainee (is able to):

1. Understand the stages of the product development process.
2. Practically knows the possibilities of shaping the product and its quality traits.
3. Knows the basic principles for the assessment of new product ideas.
4. Knows the conditions for the development of the concept of product innovation.
5. Identify opportunities for the development of the idea of product innovation.

Course materials

- PowerPoint presentations cover main topics
- Guidelines relating to the exercises: (i) analysis of the marketing environment, (ii) identification of the characteristics of the product quality and its place in the chain, (iii) identification of the product life cycle stage
- Self-testing quiz

MODULE 13

Technology development project management.

Study load: 20 hours

Description of the module

The aims of the module are to provide knowledge and skills necessary to prepare a plan of commercialization of research results and to gain knowledge about tools and techniques related to innovative project management. The main areas covered by module are as follows:

1. Business planning. Aims and objectives of the plan of commercialization. Elements of the construction plan of commercialization.
2. The search for alternatives, challenges and customers for innovation
3. Evaluation and determination of the appropriate strategy of intellectual property
4. Evaluation possible application options of research results.
5. Development of the key stimulus for the implementation of research results. Stakeholders / benefits matrix.
6. Preparation of the scenarios of technology and product development in the universities and on the market.
7. Business model canvas.
8. Cooperation on the implementation of research results or further development
9. Presentation of final position on how the development and commercialization of research results. The principles of presenting the plan of commercialization

10. Technology and product development management projects - structure, stages and management techniques.

Learning outcomes

After following this module, the trainee (is able to):

1. Knows the process of building a commercialization plan.
2. Knows the management tools supporting complex understanding of transfer of research results to industry.
3. Knows the basic principles of creating scenarios of technology and product development.
4. Knows the principles and basic tools related to technology and product development project management.

Course materials

- PowerPoint presentations cover main topics.
- Sheet to prepare a conception of plan for commercialization.
- Self-testing quiz.

MODULE 14

Financing of technology commercialization and transfer

Study load: 8 hours

Description of the module

The aim of the module is to provide knowledge and understanding related to financing strategy for the technology implementation as well as practical preparation of a financial plan. The module encompasses the practical preparation of proposals for the investor. The main areas covered by module are as follows:

1. Management and financing of the transfer process of research and commercialization.
2. Economics of innovation - selected issues related to financing innovation.
3. Stages of development and innovation funding.
4. Financing Innovation in the process of commercialization.
5. Types of sources of research funding and implementation.
6. Equity-financing - definition, pros and cons.
7. Gaining investor - types of investors, search for investor.
8. Methods and forms of preparation and presentation of offers for investors and other partners.
9. Cooperation with the investor - stages of cooperation, types of contracts, evaluation of innovation, risk assessment.

Learning outcomes

After following this module, the trainee (is able to):

1. Knows and understands the process of commercialization of research results and the process of building a financial plan as part of the commercialization plan or business plan of the company implementing research results.
2. Know and understand the decision-making process of commercialization strategies based on analysis of the available sources of financing and other relevant factors.
3. Knows the rules of creating presentations and investor preparing a bid for a partner - a strategic partner, investor, for the implementation of commercialization / implementation of research results.
4. Knows the basic conditions for the preparation of an investment agreement for the implementation of research results

Course materials

- PowerPoint presentations cover main topics
- Youtube: Financing of implementation of research results in the enterprise (in Polish)
- Webpages of equity investors
- Webpages of public sources of innovation financing
- Self-testing quiz

MODULE 15

Corporate and academic entrepreneurship

Study load: 8 hours

Description of the module

The aim of the module is to provide knowledge and understanding of commercialization process in the legal and organisational context of public research institution and corporation. The main areas covered by module are as follows:

1. Intrapreneurship - invention generation and technology development.
2. The objectives and tasks of public research Institutions, grants research, elements of commercial research. Academic entrepreneurship. University context of new technology commercialization.
3. Corporate entrepreneurship - entrepreneurial technology commercialization within large companies.
4. Legal forms to implement solutions to business practice.
5. Innovative process and intellectual property rights in the context of public and private organisation.
6. Spin off as a form of technology commercialization.
7. The technique interaction with employees of public research Institutions - characteristics of the personality, linking decision-making.

Learning outcomes

After following this module, the trainee (is able to):

1. Knows the conditions of the organizational process of commercialization of research within the public research institution and corporation.
2. Knows the legal requirements relating to the process of commercialization of research within the public research institution and corporation.
3. Knows the legal forms of commercialization of scientific research and its main features.
4. Knows the conditions of interaction with employees of public research Institutions.

Course materials

- PowerPoint presentations cover main topics.
- Case study: (i) creation of corporate spin off, (ii) creation of university based spin off.
- Self-testing quiz.

Innovation Management ver. 1 pilot training

University of Lodz will conduct pilot courses with 15 trainees who will evaluate and give feedback on the basis of the first version of Innovation Management lesson plans. The feedback collected from the participants will be used to revise the first version of lesson plans and prepare the second version, if necessary.