

Ministry of Science and Higher Education of the Russian Federation



Federal State Budgetary Educational Institution of Higher Education
Perm National Research Polytechnic University



APPROVED BY

Pro-rector for Academic Affairs

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№ 03

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ACADEMIC COURSE WORKING PROGRAM

Academic course: Investment design and procurement

(Name)

Form of education: Full-time

(Full-time /full-time - correspondence/correspondence)

Level of higher education: Master's degree

(Bachelor's program/specialist program/Master's program)

Total labour intensiveness: 180 (5)

(Hours (CU))

Training program (degree): 38.04.01 Economics

(Code and denomination of degree)

Direction: Oil and Gas Enterprise Management and Economics

(Title of curriculum)

Perm 2021

1. General Provisions

1.1. Goals and Objectives of the Course

Formation of knowledge and skills of investment design and procurement

1.2. Studied Objects of the Course

- investment activity at an enterprise;
- procurement activities at an enterprise

1.3. Starting Conditions

Unstipulated

2. Planned Results of the Course Training

Competence	Indicator's Index	Planned Results of the Course Training (to know, to know how, to master)	Indicator of Attaining Competence which the planned results of training are correlated with	Means of Assessment
PC-2.3.	AI-1 _{PC-2.3}	Knows resources, stages of implementation and methods of quality control of an investment project at oil and gas enterprises	Knows stages of implementation and probabilistic criteria for investment project economic efficiency at oil and gas enterprises	Test
PC-2.3.	AI-2 _{PC-2.3}	Is able to assess necessary resources, determine the sequence and duration of operations and plan the stages of implementation of an investment project at oil and gas enterprises as well as manage its quality and the team of an investment project	Is able to determine the sequence and duration of operations and plan the stages of implementation of an investment project at oil and gas enterprises and calculate general indicators of its efficiency as well	Practical review
PC-2.3.	AI-3 _{PC-2.3}	Has skills of definition of operations, team members and quality control of an investment project at oil and gas enterprises, as well as skills of management of the investment project team	Has skills of operations sequence and duration, planning the stages of an investment project implementation at oil and gas enterprises, calculation of main investment project indicators	Test
PC-2.7.	IA-1uc-2	Knows methods of expert estimation of applications	Knows methods of expert estimation of appli-	Test

		in the procedure of procurements and procurement activities for oil and gas enterprises	cations in the procedure of procurements and procurement activities for oil and gas enterprises	
PC-2.7.	IA-2uc-2	Is able to carry out the expert estimation of procurement procedure summarizing at oil and gas enterprises as well as develop methodological procedures within the procurement activities at oil and gas enterprises.	Is able to carry out the expert estimation of procurement procedure summarizing at oil and gas enterprises as well as develop methodological procedures within the procurement activities at oil and gas enterprises.	Practical review
PC-2.7.	IA-3uc-2	Has skills of execution of documents on the results of documentation expertise in the form of decision at the oil and gas enterprise	Has skills of execution of documents on the results of documentation expertise in the form of decision at the oil and gas enterprise	Grading test

3. Full time and forms of academic work

Form of academic work	Hours in all	Distribution in hours according to semesters			
		Number of semester			
		3			
1. Holding classes (including results monitoring) in the form:	58	58			
1.1. Contact classwork, including:					
- lectures (L)				24	24
- laboratory work (LW)				-	-
- practice, seminars and/or other seminar-type work (PW)				28	28
- control of self-work (CSW)				6	6
- test	-	-			
1.2. Students' self-work (SSW)	86	86			
2. Intermediate attestation	-	-			
Exam	36	36			
Grading test	-	-			
Test (Credit)	-	-			
Course Project (CP)	-	-			
Course Work (CW)	-	-			
Total Course Labour Intensiveness	180	180			

4. Course outline

Name of the units with the course outline	Full time of classroom activity in hours according to the forms			Full time of extracurricular work in hours according to the forms
	L	LW	PW	SSW
3 semester				
<i>Investment design as an activity</i>	4	0	4	17
Topic 1. The essence and methodology of investment design				
Design as an activity. Components of investment activity. Synthesis and analysis in investment design.				
Topic 2. Investment and economic growth				
Dependence of GDP growth and growth of fixed capital investment. Corporate growth. Investment cooperation in economic growth				
<i>Economic and mathematical modeling in investment design</i>	5	0	8	17
Topic 3. Financial analysis of investments				
The cycle of investment project modeling. Modeling in the space of economic efficiency criteria. Efficiency criteria, taking into account the limit of economic growth. The construction and synthesis of investment cycle models. Functional equations and scalar growth functions. Calculation of monetary amounts.				
Topic 4. The multidimensional model in the investment design				
The need for multidimensional discounting. The vector of NPV. Matrix internal rate of return. A vector of indices of profitability. Vector of payback periods. Vector function of logistic growth. Vector of logistics NPV. Logistic matrix of internal profitability. NPVL for two investment projects. IRR for two projects. Design of investment cooperation.				
<i>Types of investment design</i>	5	0	8	17
Topic 5. Stochastic and optimal investment design				
Probabilistic criteria of economic efficiency. Conditional probabilistic performance indicators. The first statistical moment. Adaptation of analysts. Goals and limitations in investment design. Convolution of optimality criteria. Optimization of analysts' activities. Optimization of investment portfolios. Optimization of the investment portfolio for three types of assets.				
Topic 6. Critical points, flows, and areas				
Critical flow of real money. Dynamic break-even point. The critical areas of the costs of capital. Critical areas for evaluation. Critical confidence areas. Break-even analysis for several types of project products				
Topic 7. Features of business planning at an industrial enterprise in the commercialization of scientific and technical innovations:				

Name of the units with the course outline	Full time of classroom activity in hours according to the forms			Full time of extracurricular work in hours according to the forms
Tools for analyzing the effectiveness of projects based on the crisis phenomena. Traditional approaches. Logistics growth. A model of growth and decline. A compromise of optimistic and pessimistic forecast approaches. A compromise of the three approaches. Displacement of S-shaped curves. Identification of displaced S-shaped curves. Model verification.				
<i>Analysis of mergers and acquisitions</i>	5	0	4	17
Topic 8. Tools for analyzing the effectiveness of mergers and acquisitions				
Graphical representation of the FT500 rating. Parametric representation of the ratings. Estimation of model parameters. Graphical and parametric representation of RBC ratings. Evaluation of mergers and acquisitions effects. Forecasting the consequences of consolidation of Russian banks.				
Topic 9. Tools for vectorization of economic efficiency criteria				
NPV sensitivity analysis. IRR vectorization. DPP vector. Vectors of performance criteria as a function of continuous time.				
<i>Procurement</i>	5	0	4	18
Topic 10. The concept of a procurement. Its types.				
Goals and objectives of the procurement. Principles of procurement. Organization of the procurement system. Regulation of the procurement. Evaluation of competitive procurement effectiveness. Bad faith in the procurement process. Classifiers of purchased goods, works and services.				
Topic 11. The main methods of competitive procurement.				
Open competition. Closed competition. Selective competition. A two-stage competition. Request for quotations. Competitive negotiations. Request for proposals. Purchase from a single source. Auction. Re-bidding (auction in the fall).				
Topic 12. Preparation and holding of an open competition				
The main stages of an open competition. Preparation for the competition. The tender documentation. Pre-qualification selection. Provision of the tender application. Submission and opening of applications. Evaluation of offers. The determination of the winner. Competition from the supplier's point of view.				
Total	24	0	28	86
Total	24	0	28	86

Topics of exemplary practical work

Sl.No	Topic of practical (seminar) work
1	Functional equations solver by synthesized investment models
2	Calculation of the criteria for investment project effectiveness
3	Calculation of probabilistic criteria of economic efficiency
4	Calculation of project break-even point
5	Calculation of mergers and acquisitions effects for the company
6	Optimistic and pessimistic forecasts for the project
7	Evaluating the effectiveness of competitive procurement
8	Delivery contract creation

Topics of exemplary laboratory practice - Unstipulated

Sl. No	Topic of laboratory work

5. Organizational and Pedagogical Conditions

5.1. Educational Technologies Used for Competences Formation

Holding lectures in the discipline is based on the active method of training in the process of which students are not passive but active participants of the lesson answering questions of the teacher. Teacher's questions are aimed at activating the process of learning material as well as at the development of logical thinking. The questions stimulating associative thinking and connecting new material with the previous one are identified by the teacher in advance.

Practical lessons are held by realization of the method based on active training: problem areas are determined, groups are formed. The following aims are pursued in the process of practical education: use of definite disciplines knowledge and creative methods in solving problems and decision-making; students' skill-building of teamwork, interpersonal communication and development of leadership skills; consolidation of the basic theoretical knowledge.

Laboratory classes are based on an interactive learning method in which students communicate not only with the teacher but also with each other. At the same time, students' activity in the learning process dominates. The teacher's place in interactive classes is reduced to orienting students' activities to achievement of the goals of studies. Interactive lectures, group discussions, role-playing games, training sessions, and analysis of situations and simulation models are used in academic studies

5.2. Students' Manual for the Course Study

Learning the course students are recommended to fulfill the following positions:

1. Learning of the discipline should be done systematically.
2. After learning one of the course unit with the help of the text-book or lecture notes it is recommended to reproduce in memory the basic terms, definitions, notions of the unit.
3. Special attention should be paid to the reports on practical studies, laboratory works and individual complex tasks for self-work.
4. The topic of questions studied individually is given by the teacher at the lectures. Also the teacher refers to the literary resources (first of all, to the newly published in periodicals) in order the students understand the problems touched on the lectures in detail.

6. List of Teaching Materials and Information Supply for Students' Self work in the Discipline

6.1. Paper-based courseware

Sl.№	Bibliographic entry (author, title, mode of publication, place, publishing house, year of publication, number of pages)	Number of copies in the library
1. Basic literature		
	Bregg S. M. Sliyaniya i pogloshcheniya : prakticheskoe rukovodstvo : [per. s angl.] / S. M. Bregg. - Moskva: Marosejka, Izd-vo MUM, 2011.	2
	Garnov A. P. Investicionnoe proektirovanie : uchebnoe posobie dlya vuzov / A. P. Garnov, O. V. Krasnobaeva. - Moskva: INFRA-M, 2013.	2
	Lajsons K. Upravlenie zakupochnoj deyatelnost'yu i cep'yu postavok : per. s angl. / K. Lajsons, M. Dzhillingem. - Moskva: Infra-M, 2014.	2
	Savinyh V. N. Matematicheskoe modelirovanie proizvodstvennogo i finansovogo menedzhmenta : uchebnoe posobie dlya vuzov / V. N. Savinyh. - Moskva: KNORUS, 2014.	1
	Upravlenie zakupkami i postavkami : uchebnik dlya vuzov : per. s angl./ M. Linders [i dr.]. - Moskva: YUNITI-DANA, 2017.	1
2. Additional literature		
2.1. Educational and scientific literature		
	Gohan P.A. Sliyaniya, pogloshcheniya i restrukturizaciya kompanij : per. s angl. / P.A.Gohan. - M.: Al'pina Biznes Buks, 2004.	4
	Investicionnoe proektirovanie : uchebnik dlya vuzov / R. S. Golov [i dr.] .— 2-e izd .— Moskva : Dashkov i K, 2012 .— 365 s., 23 usl. pech. l. : il.	4
	Koltynyuk B. A. Investicionnoe proektirovanie ob"ektov social'no-kul'turnoj sfery : uchebnik dlya vuzov / B. A. Koltynyuk .— Sankt-Peterburg : Izd-vo Mihajlova V.A., 2000 .— 431 s. : il.	1
	Sergeev V. I. Logistika snabzheniya : uchebnik dlya bakalavriata i magistratury / V. I. Sergeev, I. P. El'yashevich. - Moskva: YUrajt, 2016.	4
2.2. Standardized and Technical literature		
3. Students' manual in mastering discipline		
4. Teaching and learning materials for students' self work		

6.2. Electronic Courseware

Kind of literature	Name of training tool	Link to information resource	Accessibility of EBN (Internet/local net; authorized free access)
Supplementary literature	Razbudi v sebe investora	https://wakeupinvestnow.ru/?gclid=EAIaIQobChMI1qalaPO5gIViMmyCh179Q1_EAAYASAAEgIdcFD_BwE	Internet free access
Supplementary literature	The Warren Buffet Way	https://www.mann-ivanovferber.ru/books/paperbook/warren-buffett/	Internet free access

6.3. License and Free Distributed Software used in the Course Educational Process

Type of Software	Software branding
OS	Windows 10 (Azure Dev Tools for Teaching)
Office Applications	Adobe Acrobat Reader DC
Image processing software	Corel CorelDRAW Suite X4
General purpose application software	Mathematica Professional Version (license L3263-7820*)
General purpose application software	Microsoft Office Visio Professional 2016 (Azure Dev Tools for Teaching)
General purpose application software	WinRAR (license №879261.1493674)
Management systems for projects, research, development, design, modeling and implementation	Autodesk AutoCAD 2019 Education Multi-seat Stand-alone

6.4. Modern Professional Data bases and Inquiry Systems Used in the Course Educational Process

Branding	Reference to information resource
Scopus database	https://www.scopus.com/
Web of Science Database	https://www.webofscience.com/
Scientific electronic library database (eLIBRARY.RU)	https://elibrary.ru/
Scientific Library of the Perm National Research Polytechnic University	https://lib.pstu/
Lan Electronic Library System	https://e.lanbook.com/
Electronic library system IPRbooks	https://www.iprbookshop.ru/
Information resources of the Network ConsultantPlus	https://www.consultant.ru/
Company database EBSCO	https://www.ebsco.com/

7. Logistics of the Course Educational Process

Type of classes	Name of the necessary basic equipment	Number of units
Practice	projector apparatus	1

8. Fund of the Course Evaluating Tools

Described in a separate document

Ministry of Science and Higher Education of the Russian Federation
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FUND OF ESTIMATING TOOLS
For students' midterm assessment in the discipline
«Investment design and procurement»
Supplement to the Academic Course Working Program

Training program	38.04.01 Economics
Direction (specialization) of educational program	Oil and Gas Enterprise Management and Economics
Graduate qualification	Master's degree
Graduate academic chair	Economics and Industrial Production Management
Form of study	Full-time studies
Year: 2	Semester: 3
Labour intensiveness	
Credits according to curriculum	5 CU
Hours according to curriculum	180 h.
The form of midterm assessment:	
Exam 3 semesters	

Fund of estimating tools for midterm assessment of students' learning the subject «Investment design and procurement» is the part (supplement) to the academic course working program. Fund of estimating tools for midterm assessment of students' learning the discipline has been developed in accordance with the general part of the fund of estimating tools for midterm assessment of the basic educational program which determines the system of the midterm assessment results and criteria of putting marks. Fund of estimating tools for midterm assessment of students' learning the subject determines the forms and procedures of monitoring results and midterm assessment of the subject learning by the students.

1. List of controlled results of studying discipline, objects of assessment and forms of control.

According to the Academic Course Working Program mastering course content is planned during two semesters (the third semester of curriculum) and is divided into two educational modules. Classroom activities, lectures and practical work as well as students' self-work are provided for every module. In the frames of mastering course content such competences as *to know, to be able, to master* pointed out in the ACWP are formed. These competences act as the controlled results of learning the discipline «Investment design and procurement» (Table 1.1).

Monitoring of the acquired knowledge, abilities and skills is made in the frames of continuous assessment, progress check and formative assessment in the process of studying theoretical material, reports on practical works and during examination. Types of control is given in Table 1.1

Table 1.1. List of controlled results of learning the discipline

Controlled results of learning the discipline (ЗУБы)	Type of control				
	Continuous assessment		Progress check		Formative assessment
	D	AC	LWR /PW R	T/CW	Exam
Acquired knowledge					
K.1 Knows stages of implementation and probabilistic criteria for investment project economic efficiency at oil and gas enterprises		AC1		CW2	TQ
K.2 Knows methods of expert estimation of applications in the procedure of procurements and procurement activities for oil and gas enterprises	D1	AC2		CW1	TQ
A.1 Is able to determine the sequence and duration of operations and plan the stages of implementation of an investment project at oil and gas enterprises and calculate general indicators of its efficiency as well				CW2	PT
A.2 Is able to carry out the expert estimation of procurement procedure summarizing at oil and gas enterprises as well as develop methodological procedures within the procurement activities at oil and gas enterprises				CW1	PT
B.1 Has skills of operations sequence and duration, planning the stages of an investment project implementation at oil and gas enterprises, calculation of main investment project indicators					CT
B.2 Has skills of execution of documents on the results of documentation expertise in the form of decision at the oil and gas enterprise					CT

D – topic discussion; AC – colloquium (discussion of theoretical material, academic conference); CT – case-task (individual task); LWR – report on laboratory work; PWR – report on practical work; T/CW – progress check (control work); TQ – theoretical question; PT – practical task; CT – complex task of grading test.

Final assessment of the learned discipline results is the midterm assessment which is made in the form of test taking into consideration the results of the running and progress check.

2. Types of control, standard control tasks and scales of learning results assessment

Continuous assessment of the academic performance is aimed at maximum effectiveness of educational process, at monitoring students' specified competencies formation process, at increase of learning motivation and provides the assessment of mastering the discipline. In accordance with the regulations concerning the continuous assessment of the academic performance and midterm assessment of students taught by the educational programs of Higher education – programs of the Bachelor's Course, Specialists' and Master's Course the next types of students' academic performance continuous assessment and its periodicity is stipulated in PNRPU:

- acceptance test, check of the student's original preparedness and his correspondence with the demands for the given discipline learning;
- continuous assessment of mastering the material (the level of mastering the component "to know" defined by the competence) at every group studies and monitoring of lectures attendance;
- interim and progress check of students' mastering the components "to know" and "to be able" of the defined competences by computer-based or written testing, control discussions, control works (individual home tasks), reports on laboratory works, reviews, essays, etc.

Discipline progress check is conducted on the next week after learning the discipline module, while the interim control is made at every monitoring during the discipline module study;

- interim assessment, summarizing of the current students' performance at least once a semester in all disciplines for every training program (specialty), course, group;
- retained knowledge control.

2.1. Continuous assessment of education

Continuous assessment of learning is made in the form of discussion or selective recitation on every topic. According to the four-point system the results of assessment are put into the teachers' note-book and are considered in the form of integral mark in the process of the midterm assessment.

2.2. Progress check

For the complex assessment of the acquired knowledge, abilities and skills (Table 1.1) it is made the progress check in the form of report on practical works and midterm control works (after learning every discipline module).

2.2.1. Presentation of practical work

Presentation of practical work is made by the student individually or by the group of students. Standard scale and criteria of assessment are given in the general part of FET of the educational program.

2.2.2. Midterm control work

According to ACWP 2 midterm control works (CW) is planned to be realized after learning the educational modules of the discipline by the students.

The first CW is realized with respect to the module 1 “Investment design”, the second CW – with respect to the module 2 “Procurement”.

Standard tasks of the first CW:

1. Assessment and strengthening of social effects of investment projects
2. Statistical tools for analyzing the effectiveness of investment projects

1. Break-even of investment projects
2. The Markowitz model for portfolio optimization projects

Standard tasks of the second CW:

1. Structure and wording of articles of state and municipal contracts
2. Liability of the parties when concluding contracts

1. Legal regulation of public procurement
2. Contract entry terms into force

Standard scale and criteria of the results of the midterm control work assessment are given in the general part of FET of the educational program.

2.3. Fulfillment of the complex individual self-work task

Individual complex task for the students is used for assessment their skills and abilities acquired in the process of learning the discipline in which the course project or course paper is not stipulated.

Standard scale and criteria of assessment of the individual complex task presentation are given in the general part of FET of the educational program.

2.4. Midterm assessment (final control)

Admission for midterm assessment is made according to the results of continuous assessment and progress check. Preconditions for admittance are successful presentation of all practical works and positive integral estimation with respect to the results of continuous assessment and progress check.

2.4.1. Midterm assessment procedure without additional evaluation testing

Midterm assessment is made in the form of test. Credit on the discipline is based on the results of the previously fulfilled by the student individual tasks on the given discipline.

Criteria of putting the final mark for the components of competences in the process of midterm assessment made in the form of test are given in the general part of FET of the educational program.

2.4.2. Midterm assessment procedure followed by evaluation testing

In definite cases (for example, in case of re-attestation of the discipline) midterm assessment in the form of the test on this discipline can be made as the ticket-based evaluation test. Every ticket includes theoretical questions (TQ) aimed at control of the acquired knowledge, practical tasks (PT) aimed at mastered abilities, and complex tasks (CT) aimed at control of the acquired skills of all declared competences.

The ticket is formed so that the included questions and practical tasks could estimate the level of maturity of **all** declared competences.

2.4.2.1. Standard questions and tasks the discipline testing

Standard questions for the acquired knowledge control:

1. Evaluation and optimization of investment projects effectiveness
2. Legal framework for real investment
3. Assessment and strengthening of investment projects social effects
4. Assessment and risk reduction of investment projects
5. Optimization of the investment project portfolio
6. Sensitivity analysis of economic efficiency criteria of investment projects
7. The impact of inflation on investment projects effectiveness
8. Financing sources of investment projects
9. The nature and classification of real investments.
10. Statistical tools for analyzing of investment projects effectiveness
11. Discounting of real money flow
12. Justification of investment decisions
13. The method of trees in the study of investment risk
14. The scenario method in the study of investment risk
15. The Monte Carlo method in the study of investment risk
16. G. Markowitz model for project portfolio optimization
17. Application of beta coefficients in investment design
18. Algorithms for evaluating economic efficiency criteria
19. Rules for comparing investment projects
20. Methods of statistical modeling in investment
21. Evaluating and increasing market capacity
22. Break-even of investment projects
23. Tools for ensuring the investment attractiveness of the industry
24. Assessment of the technical and economic feasibility of the project
25. The choice of the structure of a business plan
26. Business plan development methodology
27. Legal regulation of public procurement
28. Structure and wording of articles of state and municipal contracts
29. Order placement procedures
30. Liability of the parties when concluding contracts
31. Terms of entry into force of the contract

Standard questions and practical tasks for the mastered abilities control:

1. Evaluate the effectiveness of the company's investment projects.
2. Make a qualitative and quantitative analysis of project risks.
3. Evaluate the effectiveness of competitive procurement.
4. Evaluate the feasibility of a merger / acquisition of the company.

Standard complex tasks for the acquired skills control:

1. Solve functional equations in synthesized investment models
2. Calculate the criteria for investment project effectiveness

3. Calculate probabilistic criteria for economic efficiency
4. Calculate project break-even point
5. Calculate the effect of mergers and acquisitions for the company
6. Build optimistic and pessimistic forecasts for the project
7. Evaluate the effectiveness of competitive procurement
8. Prepare delivery contracts.

2.4.2.2. Scales of test assessment of educational achievements

Evaluation of discipline achievements in the form of maturity level of the components *to know, to be able, to master* of the declared competences is made according to the four-point assessment scale.

Standard scale and criteria of estimating educational achievements in the process of testing for the components *to know, to be able, to master* are given in the general part of FET of educational program.

3. Assessment criteria for components and competences level of maturity

3.1. Assessment of competences components level of maturity

While estimating the level of competences maturity by selective control in the process of testing it is considered that *the mark got for the components of the examined competence is combined with the corresponding component of all competences formed in the frames of the given academic course.*

General assessment of maturity level of all competences is made by aggregation of marks got by the student for each component of the formed competences taking into account the results of continuous assessment and progress check in the form of integral mark according to the four-point scale. All control results are put into the assessment sheet by the teacher according to the results of midterm attestation.

The form of the assessment sheet and requirements for its completion are given in the general part of FET of the educational program.

While making the final assessment of the midterm attestation in the form of test standard criteria given in the general part of FET of the educational program are used.