BUSINESS ANALYSIS OF SOFTWARE AUTOMATION PROCESSES

Syllabus

Requisites of the Course	
Cycle of Higher Education	*First cycle of higher education (bachelor's degree)*
Field of Study	*12 Information Technologies*
Speciality	*121 Software engineering*
Education Program	*Software Engineering of Multimedia and Information Retrieval Systems*
Type of Course	*Elective*
Mode of Studies	*full-time*
Year of studies, semester	*4 year (8 semester)*
ECTS workload	*4 credits (ECTS)., including 54 hours of classroom work, and 66 hours of self-study.*
Testing and assessment	*Credit*
Course Schedule	*http://rozklad.kpi.ua/*
Language of Instruction	*English*
Course Instructors	*Lecturer: PhD, Associate Professor, Lesya Lyushenko, email LyushenkoL@gmail.com*

Outline of the Course

1. **Course description, goals, objectives, and learning outcomes.**

   The study of the discipline "Business Analysis of Software Automation Processes" allows students to form the competencies necessary for solving practical problems of professional activity related to the automation of software processes, and the acquisition of knowledge of methods and modeling and automation of software systems management processes using international standards.

   The purpose of studying the discipline "Business Analysis of Software Automation Processes" is to form the ability of students to systematically approach: modeling business processes in the creation and software; management of business process automation projects using international standards and "best practices" (BABOK, SWEBOK, PMBOK, etc.), as well as acquisition by applicants of the competencies of forming a systematic approach to documenting and management process.

   The subject of the discipline "Business Analysis of Software Automation Processes" are methods, technologies and models that are used for modeling, regulation of automation processes, implementation and maintenance of software systems for automating business processes.

The study of the discipline "Business Analysis of Software Automation Processes" contributes to the formation of general competencies (GC) among students, namely:

GC 01 *Ability to abstract thinking, analysis and synthesis.*
GC 03 *Ability to communicate in the state language both orally and in writing.*
GC 04 *Ability to communicate in a foreign language both orally and in writing.*
GC 05 *Ability to learn and use modern knowledge*.

*During the study of the discipline, applicants form professional **competencies (PC)** necessary for solving practical problems of professional activity related to project management for the development, implementation, improvement and operation of software information systems, namely:*

__PC02__ Ability to participate in software design, including its structure, behavior and functioning processes modeling (formal description).

__PC03__ Ability to develop software systems architectures, modules and components.

__PC05__ Ability to follow specifications, standards, rules and recommendations in the professional field during the life cycle processes implementation.

__PC13__ Ability to reasonably select and master software development and maintenance tools.

__PC14__ Ability to algorithmic and logical thinking..

*The study of the discipline "Business Analysis of Software Automation Processes" contributes to the formation of students' following **programmatic learning outcomes (PLO)** in the educational program:*

__PLO 01__ To analyze, purposefully search and select the necessary information and reference resources and knowledge to solve professional problems, taking into account modern advances in science and technology.

__PLO 02__ To know the professional ethics code, understand the social significance and cultural aspects of software engineering and adhere to them in professional activities.

__PLO 03__ To know the software life cycle basic processes, phases and iterations.

__PLO04__ To know and apply professional standards and other regulatory documents in the field of software engineering.

__PLO 05__ To know and apply relevant mathematical concepts, domain methods, system and object-oriented analysis and mathematical modeling for software development.

__PLO 06__ Ability to select and use the appropriate task of software development methodology.

__PLO 10__ To conduct a pre-project survey of the subject area, system analysis of the design object..

__PLO 32__ To be able to develop and analyze full cycle models for multimedia and information retrieval systems software creation.

__PLO 37__ To know and to be able to manage the creation and implementation of software projects according to the standards PMBOK, SWBOK, BPMCBOK.

Prerequisites and post-requisites of the course (the place of the course in the scheme of studies in accordance with curriculum))

The successful study of the discipline "Business Analysis of Software Automation Processes" is preceded by the study of the disciplines "Algorithms and data structures", "Programming" and "Components of software engineering" of the curriculum for the preparation of bachelors in the specialty 121 Software Engineering.

Theoretical knowledge and practical skills obtained during the assimilation of the discipline "Standardization and technologies for the development of multimedia and information-search software products" ensure the successful study of "Software Security", the implementation of course projects and bachelor's diploma projects in the specialty 121 Software Engineering. .

Content of the course

The discipline "Business analysis of software automation processes" involves the study of the following topics:

Topic 1. Fundamentals of the process approach in the management of information systems

Topic 2. Methods and technologies of business analysis

Topic 3. Automation of management processes, creation and operation of information systems

Modular test

Credit

Coursebooks and teaching resources

Basic reading

1. BABOK v3. A Guide to the Business Analysis Body of Knowledge. – Toronto, Ontario, Canada :
2. Steven P. Blais Business Analysis.Best Practices for Success. Wiley Year. 2011 ISBN 9781118161555
3. Debra Paul, James Cadle, Malcolm Eva, Craig Rollason, Jonathan Hunsley Business Analysis BCS, The Chartered Institute for IT 2020 p.327 ISBN 9781780175126
4. David Bourgeois, JAMES L. SMITH, SHOUHONG WANG Information Systems for Business and Beyond 2019 -327 p. https://opentextbook.site/exports/ISBB-2019.pdf
5. Fred Heath Managing Software Requirements the Agile Way: Bridge the gap between software requirements and executable specifications to deliver successful projects. Packt Publishing. 216 p.ISBN: 1800206461.
6. Agile Extension to the BABOK® Guide (Agile Extension). Int'l Institute of Business Analysis: 2018. 180 p.

Basic reading

7. Business Analysis for Practitioners. A Practice Guide. Project Management Institute. 2015 -206 p ISBN 978-1628250695
8. Business process simulation service. – : https://www.bpsimulator.com
9. Business Process Model and Notation [Electronic resource]. – Access mode: http://www.bpmn.org.
10. ARIS community website [Electronic resource]. – Access mode: http://www.ariscommunity.com.
11. IDEF, Integration DEFinition methods [Electronic resource]. – Access mode: http://www.idef.com. International Institute of Business Analysis, 2015. – 504 p.
12. Business Rules Community. – http://www.brcommunity.com/
13. International Institute of Business Analysis. – http://www.iiba.org/
14. Modern Analyst: Business Analyst/Business Analysis Community. – http://www.modernanalyst.com/
15. Systems Analyst. : http://www.systemsanalyst.co
16. Mathias Weske: Business Process Management: Concepts, Languages, Architectures. Springer-Verlag Berlin Heidelberg 2019, 417 p. Springer Link eBook ISBN 978-3-662-59432-2.

	Educational content	

Methods of mastering the discipline (educational component)

№	Type of training session Description	Description of the training session
	Topic 1. Fundamentals of the process approach in the management of information systems	
1	Lecture No1 Introduction to the course. Basic definitions and principles of business analysis.	Management concepts based on process models. Basic definitions and principles of business analysis. Business analysis of information systems.
2	Lecture No2 Fundamentals of BPM technology.	What is BPM technology.The evolution of technology BPM. Competencies business analyst, process architect, business architect of the system, initiator of the program BMP. Responsibility and opportunities BMP specialists in

		the creation of Information software systems. International professional certifications.
3	Computer workshop No1 Case selection for information system modeling	Choosing a case for modeling an information system. Professional position of business architect of the system for computer workshop. Primary description of the information system. Business requirements for the system.
4.	Lecture No 3. International standardization BPM (Part 1) Lecture No 3. International standardization of BPM (Part 2)	Basic standards: BPM CBOK, BABOK . Application features. BPM CBOK, BABOK and SWEBOK , PMBOK, ISO.
	Topic 2. Methods and technologies of business analysis	
5	Lecture No4. Theoretical foundations of business process management (Part 1) Lecture No4. Theoretical foundations of business process management (Part 1)	Basic concepts and principles of business process management. Principles of formation of information systems from the point of view of business analysis. Approaches to the implementation of projects for the automation of management processes.
6	Computer workshop No2 Contextual processes. Processes of the upper level of the information system	Contextual processes. Processes of the upper level of the information system. Communication through business processes of the main modules of the information system. Hierarchy or process. Decomposition of processes of the upper level. The purpose of creating systems.
7	Lecture No5. Business processes in the life cycle of the software system. (Part 1) Lecture No5. Business processes in the life cycle of the software system. (Part 2)	The life cycle of the software system. Phases of the life cycle and business processes of the project: initiation, planning, execution, completion. Control processes. Description and regulation. Business management cycles
8	Lecture No6 Process modeling Basic notations. (part 1) Lecture No6 Process modeling Basic notations. (part 2)	Vision and purpose of software system modeling. Levels of the process model. Methods and tools of modeling. Validation. Simulation modeling
9	Computer workshop No3. Formation of the process model of the software information system.	Formation of the process model of the software information system. Notations of business process descriptions.
10	Lecture No7 Designing information system processes (part 1)) Lecture No7 Designprocesses of information systems (part 2)	Basics of process design. Design of work flows. IT infrastructure design. Simulation modeling
12	Computer workshop No 4. Scenario approach .	Formation of scenarios for the process model of the software information system. Script description notations .
11	Lecture No8 Analysis of information system processes (part 1) Lecture No8 Analysis of information systems processes (part 2)	Analysis of system processes. Methods, technologies, means. Role model of the process of analyzing the software system. Report. Changes.

13	Lecture No9 Process performance management	Basic principles of process performance management. Measurements and measurement methods. Performance criteria. Monitoring and control.
14	Computer workshop No 5. Analysis of the effectiveness of processes in the information system. .	Development of monitoring and control processes. Development of performance criteria. Regulations for measuring and reporting.
Topic 3. Automation of management processes, creation and operation of information systems		
15	Lecture No 10 Automation of management processes	Process approach in DOCFLOW systems. Principles of building DOCFLOW corporate randvnya.
16	Lecture No 10 Creation of quality management systems	Creation of quality management systems and process approaches to the operation of information systems. ITILL and quality systems andSO.
Modular test		
Credit		

6. Self-study

The discipline "Business Analysis of Software Automation Processes" is based on independent preparation for classroom classes on theoretical and practical topics.

№	The name of the topic submitted for independent study	Hours	Literature
Topic 1. Fundamentals of the process approach in the management of information systems			
1	Lecture No1 Introduction to the course. Basic definitions and principles of business analysis.	1	1,2,6,7
2	Lecture No2 Fundamentals of BPM technology.	1	2,3,7,16
3	Computer workshop No1 Case selection for information system modeling	3	3,5,7,16
4.	Lecture No 3. International standardization BPM (Part 1)	1	1,7,9,12
	Lecture No 3. International standardization of BPM (Part 2)	1	
Topic 2. Methods and technologies of business analysis			
5	Lecture No4. Theoretical foundations of business process management (Part 1)	1	1,3,5, 7
	Lecture No4. Theoretical Foundations of Business Process Management (Part 2)	1	
6	Computer workshop No2 Contextual processes. Processes of the upper level of the information system	3	1,2,10,11,12
7	Lecture No5. Business processes in the life cycle of the software system. (Part 1)	1	1,2,3,13,14
	Lecture No5. Business processes in the life cycle of the software system. (Part 2)	1	

8	*Lecture No6 Process modeling Basic notations.(part 1)*	*1*	*1,2,10,11,13,15*
	Lecture No6 Process modeling Basic notations.(Part 2)	*1*	
9	*Computer workshop No3. Formation of the process model of the software information system.*	*3*	*1,2,3*
10	*Lecture No7 Designing information system processes (part 1)*	*1*	
	Lecture No7 Designing information systems processes (part 2)	*1*	*1,2,3,6*
12	*Computer workshop No 4. Scenario approach .*	*3*	*1,2,7,8*
11	*Lecture No8 Analysis of information system processes (part 1)*	*1*	
	Lecture No8 Analysis of information systems processes (part 2)	*1*	*3,4,5*
13	*Lecture No9 Process performance management*	*1*	*3,4,5*
14	*Computer workshop No 5. Analysis of the effectiveness of processes in the information system.*	*3*	*1,2,7,8*
Topic 3. Automation of management processes, creation and operation of information systems			
15	*Lecture No 10 Automation of management processes*	*1*	*6,12,13,14*
17	*Lecture No 11 Creation of quality management systems*	*1*	*7,8,16*
Modular test		*15*	*1-16*
Credit		*19*	*1-16*

Politics and control

7. Policy of the discipline (educational component Policy of the discipline (educational component)

Attendance of lectures is mandatory.

Attendance at computer workshop classes can be episodic and, if necessary, consultation/defense of computer workshops.

Rules of conduct in the classroom: activity, respect for those present, disconnection of phones.

Adherence to the policy of academic integrity.

Rules for the protection of computer workshops: work must be done in accordance with the tasks and in accordance with the option, in accordance with the requirements.

8. Types of control and rating system for evaluating learning outcomes

During the semester, students perform 5 computer workshops. The maximum number of points for each computer workshop: 16 points. The execution of all computer workshops is mandatory for obtaining a test.

Points are awarded for:

- quality of computer workshop: 0-10 points;
- answer during the protection of the computer workshop: 0-3 points;
- timely presentation of work to the defense: 0-3 points.

Criteria for assessing the quality of performance:

10 points – the work was performed efficiently, in full;
7-9 points – the work is performed efficiently, in full, but has drawbacks;
3-6 points – the work is completed in full, but contains minor errors;
2 pointsu – the work is completed in full, but contains significant errors;
0 points – the work is not completed in full.

Criteria for evaluating the answer:

3 points – the answer is complete, well-reasoned;
2 points – the answer is correct, but has flaws or minor errors;
1 point – there are significant errors in the answer;
0 points – no answer or the answer is incorrect.

Criteria for assessing the timeliness of the submission of work to the defense:

2 points – the work is submitted to the defense no later than the specified period;
0 points – the work is submitted to the defense later than the specified period.

The maximum number of points for the implementation and protection of computer workshops:

16 points × 5 comp. pract. = 80 points.

During the semester, lectures are given surveys on the topic of the current lesson. The maximum number of points for all surveys: 3 points. The number of surveys on the topic of the current lesson for one student is unlimited.

The task for a modular test consists of 1 theoreticale and 1 practical forquestions. The answer to each question is estimated at 1 0 points.

Criteria for evaluating each test question:
9-10 points – the answer is correct, complete, well-reasoned;
7-8 points – the answer is correct, detailed, but not very well reasoned;
5-6 points – in general, the answer is correct, but has drawbacks;
3-4 points – there are minor errors in the answer;
1-2 points – there are significant errors in the answer;
0 points – no answer or the answer is incorrect.

The maximum number of points for a modular test:

10 points × 2 questionsь = 20 points.
The rating scale for the discipline is equal to:
R = RC = 80 points + 20 points = 100 points.

Calendar control: it is carried out twice a semester as a monitoring of the current state of fulfillment of the requirements of the syllabus.
At the first certification (8th week), the student receives "enrolled" if his current rating is at least1-5 points (50% of the maximum number of points that a student can receive before the first certification).
At the second certification (14th week), the student receives "enrolled" if his current rating is at least 30 points (50% of the maximum number of points that a student can receive before the second certification).

Semester control: credit
Conditions of admission to semester control:

With a semester rating (RC) of at least 60 points and enrollment of all works of the computer workshop, the student receives a credit "automatic" in accordance with the table (Table of correspondence of rating points to grades on a university scale). Otherwise, he must perform a test paper.

A necessary condition for admission to the test work is the implementation and protection of a computer workshop.

If a student does not agree with the grade "automatic", he may try to increase his grade by writing a test paper, while his points received for the semester are preserved, and of the two marks received by the student, the best ("soft" grading system is set).

Table of correspondence of rating points to assessments on a university scale:

Score	Score
100-95	Perfectly
94-85	Very good
84-75	Well
74-65	Satisfactory
64-60	Enough
Less than 60	Disappointing
Admission conditions not met	Not allowed

Additional information on the discipline (educational component)

The list of questions submitted for semester control is provided in Appendix 1.

Work program of the discipline (syllabus):

Compiled by Candidate of Technical Sciences, Associate Professor, L.A. Liushenko

Adopted by Computer Systems Software Department (protocol № 8 from 25.01.23)

Approved by the Faculty Board of Methodology (protocol № 6 from 27.01.23)

Appendix 1. The list of questions that are submitted for semester controlКонцепції управління на основі процесної моделі

1. *Software system life cycle processes*
2. *Definition of VRM*
3. *Define the concept of "business process"*
4. *Management concepts based on process models.*
5. *Basic definitions and principles of business analysis.*
6. *Business analysis of information systems.*
7. *Technology BPM.*
8. *Evolution of VRM technologies.*
9. *Competencies business analyst, process architect, business architect of the system, initiator of the VMR program.*
10. *Responsibility and capabilities of VMR specialists in the creation of Information Software Systems.*
11. *International professional certifications of specialists in business analysis.*
12. *Choosing a case for modeling an information system.*
13. *Primary description of the information system. Business requirements for the system.*
14. *Basic standards: VRM SWOK, VAVOK .*
15. *Features of the application. Communication of VRM SWOK, VAVOK and SWEBOK , PMBOK, ISO.*
16. *Basic concepts and principles of business process management.*
17. *The principleand formation of information systems from the point of view of business analysis.*
18. *Approaches to the implementation of projects for the automation of management processes.*
19. *Processes of the upper level of the information system.*
20. *Decomposition of processes of the upper level. The purpose of creating systems.*
21. *Vision and purpose of software system modeling. Levels of the process model. Methods and tools of modeling. Validation.*
22. *Simulation modeling*
23. *Formation of the processmodel of the software information system.*
24. *Notation description of business processes.*
25. *. Design of work flows.*
26. *IT infrastructure design.*
27. *Formation of scenariosfor* the process *model of the software information system.*
28. *Notation description of scenarios .*
29. *Analysis of system processes.*
30. *Basic principles of process performance management.*
31. *Measurements and measurement methods. Performance criteria. Monitoring and control.*
32. *Development of monitoring and control processes.*
33. *Development of performance criteria. Regulations for measuring and reporting.*
34. *Процесний approach в сис темахDOCFLOW.*
35. *Principles of building DOCFLOW corporate level.*
36. *Creation of quality management systems.*
37. *Process approaches to the operation of information systems. ITILL*
38. *Process approaches of ISO quality system.*