

Ministry of Education and Science of the Russian Federation
Federal State Autonomous Educational Institution of Higher Education

National Research University
Lobachevsky State University of Nizhny Novgorod

APPROVED:
Director,

« ____ » _____ 2021

Work Program of the Course

Computer Science

(name of the subject (course))

Level of Higher Education

Bachelor

Area of Study

41.03.05 «International relations»

Program

World politics

Degree

Bachelor

Form of Training

Full – Time

Nizhny

Novgorod 2021

1. The Place and the Goal of the Course in the Structure of the Main Education (Degree) Program

The Goal of the Course is to familiarize students with theoretical and practical information, which reflect the main trends of informatics development, maintenance and acquisition of knowledge and skills of students in the use of modern software tools in the subject area, the development of efficient algorithms for solving scientific and engineering problems of mathematical and numerical modeling using modern programming languages, submit the basics of computer graphics, database design, basic concepts of network technologies

The course Computer Science is a part of the block of variable courses. The discipline is taught in the

2 semester. The workload of the discipline is 2 ECTS.

2. Requirements for the Learning Outcomes of the Course. Student's Competences to be Developed as a Result of the Learning of the Course Material

Competences to be Developed

- to know basic methods and means for obtaining, storing, processing information, to have skills of working with a computer as a means of information management; to be able to work with information in global computer networks (GCC -5);
- to be able to understand the nature and value of information in the development of modern information society, be aware of the dangers and threats that arise in this process, to comply with the basic requirements of information security, including the protection of state secrets (GPC -8);

3. The Structure and Content of the Course

Structure of the Course:

The overall workload of the course is	<u>2</u>	credits,
For full-time students:	<u>72</u>	hours.
Contact work with the teacher	<u>32</u>	hours.
Lectures	<u>16</u>	hours.
Seminars	<u>16</u>	hours.
Student's independent work	<u>40</u>	hours.

Titles of the chapters and topics of the discipline	Workload (hours)	Including				
		Contact Work with Professors				Independent work
		Lectures	Seminars	Lab classes	Total	
Topic 1. Subject of Computer Science. Numbering systems.	6	1	1			2
Topic 2. History of computer facilities development	5	1	1			2
Topic 3. PC tools.	6	1	1			4
Topic 4. Modern programming tools	5	1	1			2
Topic 5. Computer networks, networking and telecommunication technologies	7	2	2			4
Topic 6. Introduction to Programming. Basics of algorithms	7	1	1			4
Topic 7. Programming languages	7	2	2			4
Topic 8. Basics of information protection	6	1	1			2
Topic 9. The main objects and Windows management techniques	7	1	1			2
Topic 10. MS Word Text Editor	7	1	1			2
Topic 11. MS Excel spreadsheet	7	1	1			4
Topic 12. DMBS MSAccess	7	1	1			4
Topic 13. MS Power Point presentations	7	1	1			2
Topic 14. Internet ABCs. Anti-virus programs.	6	1	1			2
Midterm Assessment - Pass/ Fail Credit						

The course consists of lectures, practical classes, independent work of students and the test for students at the end of the semester.

Lectures are designed for to provide theoretical understanding and to summarize difficult sections of the course that are covered mainly on the problem level, using multimedia presentations.

Practical classes are realized in the form of practical seminars, with various discussions, presentations, solving tasks of various types. They are designed for consolidation and deeper study of certain aspects of the lecture material.

A significant place in the study of the discipline is given to students' independent work. Independent work is a type of out-of-classroom activities aimed to familiarize the student with certain parts of the course with the use of the materials recommended by the teacher and to help the student prepare for seminars and tests.

Content of the course

Topic 1. Subject of Computer Science. Number systems

The subject of Computer Science encompasses a broad field of knowledge ranging from studies of algorithms, computational processes and data structures. Representation all kinds of data and information in the digital computer. Decimal number system. Binary number system. Octal number system. Hexadecimal number system. Data conversion.

Topic 2. History of computer facilities development

The significance of Boolean Algebra. Early Computers (1937-1946). First Generation of Computers (1946-55). Second Generation Computers (1956-1965). Third Generation Computers (1966-1976). Fourth Generation Computers (after 1976). Next computers generation projects. Supercomputers.

Topic 3. PC tools

Personal computers architecture and operation systems. File system and file management tools. Memory management tools. File archiving tools. Anti-virus tools. Networking tools.

Topic 4. Modern programming tools

The subject of computer programming. Programming languages and techniques. Graphic and Block programming. Compilers and interpreters. Data types and operations. Control structures. Object-oriented programming. User interface development. Programming for WWW.

Topic 5. Computer networks, networking and telecommunication technologies

Computer networks development history. Network hardware and architecture. Local networks. Network protocols. Network Administration. Network services. Network programming. Global networks: WWW example. Using WWW services.

Topic 6. Introduction to Programming. Basics of algorithms

About Programming. Programming Languages. How a Program is Organized. Variables – Data Types and Operations. Operation Precedence. Variables – Memory Allocation, Smallest and Largest Values. Boolean Expressions and Relational Operators. Control Structures: Conditions and Loops. Sub-Programs: Procedures and Functions. Scope: Global and Local Variables.

Topic 7. Programming languages

Evolution of Programming Languages. Machine Languages. Assembly Languages. High-Level Languages (Third generation). Forth-generation Languages (Visual Environment). Fifth-generation Languages and Artificial Intelligence.

Topic 8. Basics of information protection

Security's Foundation. Computer Functions and Networking. An Introduction to Cryptography. Cyber Security Technologies. Wireless Network Security. Data Protection Protocols. Protected Operation Systems. Global Information Security Fundamentals.

Topic 9. The main objects and Windows management techniques

The Operating Systems Concepts. MS Windows as the Most Popular OS for PC. MS Windows Versions. Navigation in MS Windows. The Desktop. Working with Applications. File Management. Finding Files and Applications. Common Computer Tasks. Adjusting Your Settings. User Account and Profiles. Common Applications.

Topic 10. MS Word Text Editor

MS Word as a Part of MS Office. Getting Started with Text Editing. Basics of Document Formatting. Creating Outlines. Using Tables, Charts and Art. Sharing Word Documents.

Topic 11. MS Excel spreadsheet

MS Excel as a Part of MS Office. Getting Started with Excel 2010. Formatting Worksheets and Data. Formulas and Functions. Working with Tables. Creating Charts.

Topic 12. DMBS MS Access

Data and Information. Advantages and Disadvantages of DBMS. Tables, Records and Fields. Relations and Relational Databases. User Interface Forms. Using Queries to Filter Stored Data. SQL Language and Query Designer. Reports Based on Queries.

Topic 13. MS Power Point presentations

MS Power Point as a Part of MS Office. Planning Presentation Content. Getting Started with Presentation Design. Displaying Text and Graphics. Animating the Presentation. Sharing the Presentation.

Topic 14. Internet ABCs. Anti-virus programs.

Connecting to the Internet. Understanding the Cloud. Using Web Browser. Understanding Hyperlinks. Downloading and Uploading. Using Search Engines. Understanding URLs. Using Cloud Services. Getting Viruses from Internet. The Computer Virus Classification. Anti-virus software. Computer Cleaning Tools.

4. Educational technologies

In the teaching and learning of the course, educational technologies are used in the following forms: lectures, practical classes, seminars (problem-oriented, discussions), out-of-classroom independent work, preparation of reports. In the course of studies, modern educational methods are

used, including the project method and information technology. Lectures are accompanied with computer presentations. Special tests have been designed to monitor academic performance electronically. The tests serve for independent assessment of the students' level and for current and final academic performance assessment.

An important area in the Russian education system's modernization is the improvement of methods and forms of education. The main purpose is to develop and enhance students' professional skills in accordance with the requirements of the Ministry of Education and Science. A number of active and interactive forms of learning are used during the practical classes.

The educational technologies used to teach the course include:

- participation in surveys and discussions;
- preparing reports;
- completing tasks modules;
- problem solving and tests;
- working in discussion groups.

Faculty members will familiarize themselves with the psychological and physiological characteristics of students with special needs or disabilities, individual rehabilitation programs for disabled persons (if available). When necessary, additional support is provided for teaching by tutors, psychologists, social workers, and specially trained assistants.

In accordance with the methodological recommendations of the Ministry of Education and Science of the Russian Federation (approved on April 8, 2014, No. AK-44/05vn), the course is expected to use socially active and reflexive teaching methods, technologies of socio-cultural rehabilitation with the aim of assisting in establishing full-fledged interpersonal relationships with other students and creating a comfortable psychological climate in the student group. Didactic materials are selected and prepared with the account of the need to present the material in various forms: audial, visual, using special technical equipment and information systems.

Students with special needs use general and special training aids (personal and collective) when learning the course material. Infrastructural support provides for the adaptation of classrooms to the needs of students with special needs.

The form of certification for students with disabilities is determined taking into account their individual psychological and physical characteristics. For students with special needs, a convenient form of providing assessment tools is envisaged, namely:

- in printed or electronic form (for persons with disorders of the musculoskeletal system);
- in printed or electronic form with increased font and contrast (for persons with hearing, speech, visual impairments);
- by an assistant reading the assignment aloud (for those with visual impairments).

Students with disabilities are given more time to prepare answers to control questions. For such students, a convenient form for providing answers is provided, namely:

- in writing on paper or by typing the answers on a computer (for persons with hearing and speech impairments);

- choosing the answer from possible options (multiple choice) using the services of an assistant (for persons with musculoskeletal disorders);
- in an oral form (for persons with visual impairments and musculoskeletal disorders).

5. Methodological support for students' independent work.

The course consists of lectures, seminars, independent work of students and the comprehensive final test.

A significant role in the study of the discipline is given to independent work of students; its scope is defined by the curriculum. Independent work is a form of out-of-classroom activities mandatory for each student.

In the course of their independent work, students familiarize themselves with theoretical material from textbooks and monographs given in the list of recommended literature, solve practical problems, prepare for seminars, write papers, essays, take electronic tests in the learning mode, answer self-test questions. Independent work can be done in the reading halls of the library or at home. Self-checks in the course of independent work may be in the form of electronic tests or credit tasks. At the end of studies, there is a regular test.

Independent work is intended to familiarize the student with certain sections of the course and additional materials, it gives the opportunity to study the main topics in-depth, to acquire new knowledge, skills, abilities. Independent work is based on the use of recommended materials and envisages tasks of various types.

Students' independent work includes:

- the collection and study of materials necessary for participation in interactive games, and other forms of interactive work;
- preparation of the tasks most relevant to discipline topics;
- preparation for current assignments and testing;
- preparation for the final control.

The report can be prepared in two versions:

A) A text in the Word format (6 – 8 pages, 12 font size, 1,5 spaced) includes:

- title page
- content
- introduction
- the main text of the report
- conclusion.
- references (list of literature sources and Internet information)
- appendices (if necessary).

For all the fragments of the text used in the report, references and/or footnotes should be made to the sources of information, including the Internet (exact site address and access date). Such references and/or footnotes should be placed at the end of the text.

B) A presentation in the Power Point format (up to 15 slides) includes:

1. Title slide,

2. Analysis of dynamics factors and statistical indicators,
3. Conclusions.
4. The official UNN presentation slide template should be used.

Case study includes:

1. Determine and define the research questions
2. Select the cases and determine data gathering and analysis techniques
3. Prepare to collect the data
4. Collect data in the field
5. Evaluate and analyze the data
6. Prepare the report

The main organizational principle of students' independent work is an integrated approach aimed at developing critical thinking of students and promoting diversified activities.

Control of students' knowledge includes:

- Monitoring the work on practical tasks, taking into consideration the degree of activity of each student and timely performance of assignments.
- Preparation of detailed answers on topical issues.
- Monitoring the progress of testing based on the study of selected topics and modules of the discipline.
- The final assessment in the form of the final written test or oral answer.
- The final grade is based on the results of the student's work within practical classes, reports, results of ongoing work and final testing.

Independent work is an out-of-class type of activities designed to familiarize the student with certain parts or topics of the course with the recommended materials and to prepare individual assignments for the course.

The main principle of organization of students' independent work is an integrated approach aimed at developing critical thinking of students and promoting diverse activities.

Monitoring students' current progress is envisaged after studying each module. The students will be evaluated by conducting tests, writing essays and tests on the subjects they have studied. Oral answers during seminars and practical classes will also be assessed. The results of current work and tests will be taken into account to determine the final grade.

INSTRUCTIONS FOR STUDENTS

The study of the theoretical material is determined by the curriculum of the discipline which is included into the plan of study and the list of recommended literature. It is necessary to recapitulate the material of previous topics, as well as the material of the preceding academic disciplines that serves as the base of the topic being studied. When preparing for the practical lesson, you must study the lecture materials and read the recommended literature. The material studied should be analyzed in accordance with the lesson plan, and then the degree of assimilation of the material should be verified.

Practical classes are inseparably connected with homework as the main part of independent work. They are part of a systematic study in combination with the theoretical material. The knowledge and skills acquired are assessed within the framework of interim and final attestation (tests and exams) .

Independent work is carried out with the purpose of deepening of knowledge and includes:

- recapitulation of the material studied in class, reading the recommended literature;
- preparation for practical classes;
- implementation of group and individual assignments;
- work with electronic sources;
- preparation for the final control.

Students' independent work consists of the study of literature complementing the material presented in the lectures.

It is assumed that, having listened to the lecture, students should refer to the literature from the main bibliographical lists of books, then search for the necessary additional information and critically evaluate the material from the Internet sites.

Students should master the skills of bibliographic search, including search in the Internet resources, they should learn how to compare different points of view and determine research methods.

It is important to plan time for independent work for the entire semester and it is necessary to set aside some time for recapitulation of the material.

In their preparation for the final exams, students should be guided by the list of questions for the final control on the course. They must understand the basic concepts of the discipline.

6. Evaluation tools for monitoring students' current progress and for interim assessment based on the learning of the course material

6.1. Criteria for assessing learning outcomes

Competency map

Competency indicators	Assessment criteria (descriptors)						
	«Poor»	«Unsatisfactory»	«Satisfactory»	«Good»	«Very good»	«Excellent»	«Perfect»
	FAIL		PASS				
Knowledge	Lack of knowledge	Fragmented knowledge about the main concepts of the discipline	General, but not structured knowledge of the concepts of the discipline	Developed knowledge, with some gaps, of the concepts of the discipline	Developed knowledge, with some flaws, of the concepts of the discipline	Fully developed knowledge of the main concepts of the discipline	Fully developed knowledge of the main concepts of the discipline, as well as the knowledge of concepts of other disciplines
Abilities	Lack of ability to solve standard tasks	Serious errors in solving standard tasks	Able to solve main standard tasks with some minor errors	Able to solve all standard tasks with some minor flaws	Able to solve all standard tasks without any errors or flaws	Able to solve standard and some non-standard tasks	Able to solve standard and a wide range of non-standard tasks
Skills	Total lack of skills envisaged by the competency	Lack of some critical skills envisaged by the competency	Minimum requisite set of skills is available	Most main skills available and demonstrated in standard situations	All the main skills available and demonstrated in standard situations	All the skills available and demonstrated in standard situations	All the skills available and demonstrated in standard and non-standard situations
Grading scale (percentage of assignments fulfilled correctly)	0 – 20 %	20 – 50 %	50 – 70 %	70-80 %	80 – 90 %	90 – 99 %	100%

6.2. Scale for the assessment of the learning outcomes:

Assessment scale				Assessment criteria	General Characteristics
		Scale	ECTS		
Perfect	Pass	95-100	A	100 %	Exceptional breadth and depth of knowledge and understanding of the area of study; evidence of extensive and appropriate selection and critical evaluation/synthesis/analysis and of reading/research beyond the prescribed range, in both breadth and depth, to advance work/direct arguments; exceptional demonstration of relevant skills; excellent communication; performance deemed to be beyond expectation.
Excellent	Pass	83-94	B	90 - 99 %	Outstanding/excellent knowledge and understanding of the area of study as the student is typically able to go beyond what has been taught; evidence of extensive and appropriate selection and critical evaluation/synthesis/analysis of reading/research beyond the prescribed range, to advance work/direct arguments; excellent demonstration of relevant skills; excellent communication; performance deemed beyond expectation of the level.
Very Good	Pass	68-82	C	80 - 90 %	Very good knowledge and understanding of the area of study as the student is typically able to relate facts/concepts together with some ability to apply to known/taught contexts; evidence of appropriate selection and evaluation of reading/research, some beyond the prescribed range, may rely on set sources to advance work/direct arguments; demonstrates autonomy in approach to learning; very good demonstration of relevant skills; strong communication skills.
Good	Pass	56-67	D	70 - 79 %	Good knowledge and understanding of the area of study balanced towards the descriptive rather than analytical; evidence of appropriate selection and evaluation of reading/research but generally reliant on set sources to advance work/direct arguments; good demonstration of relevant skills, though may be limited in range; communication shows clarity but structure may not always be coherent.
Satisfactory	Pass	50-55	E		Knowledge and understanding is sufficient to

				50 – 69%	deal with terminology, basic facts and concepts but fails to make meaningful synthesis; some ability to select and evaluate reading/research however work may be more generally descriptive; strong reliance on available support set sources to advance work; arguments may be weak or poorly constructed; adequate demonstration of relevant skills over a limited range; communication/presentation is generally competent but with some weaknesses.
Unsatisfactory	FAIL	20-49	FX	20 – 49 %	Highly insufficient knowledge or understanding of the area of study; understanding is typically at the word level with facts being reproduced in a disjointed or decontextualized manner; fails to address the outcomes addressed by the course; typically ignores important sources in development of work and data/evidence inappropriately used; weak technical and practical competence hampers ability to demonstrate/communicate achievement of outcomes.
Poor	FAIL	0-19	F	0 – 19 %	Work of no merit OR absent, work not submitted, penalty in some misconduct cases.

The test is passed if the students fulfill the requirements of at least the “Satisfactory” level. The test is failed in case of “Unsatisfactory” and “Poor” grades.

Breakdown of grades

Classwork (reports with Power Point presentation, participation in discussions)/Homework (Participation): **40%**

Midterm Tests (are taken 2 or 3 times during a semester in the form of tests or essays): **20%**

Attendance: **10%**

Final Test (written or oral): **30%**

A competence is considered to be fully developed if students receive an "excellent" grade; partially developed as "good" and "satisfactory"; not developed if the student does not receive a positive grade.

6.3. Typical assignments or other materials necessary for the assessment of learning outcomes

No	Type of assessment tools	Brief characteristics of assessment tools	Description of tools
1	Report	The result of a student's independent work in the form of a public speech with the presentation of the results of	Topics of Reports

		the student's research on proposed topics	
2	Control Assignment	<p>A tool for skills assessment showing how a student can</p> <ul style="list-style-type: none"> - apply his knowledge for solving problems of a certain type in a special topic or problem - use his knowledge in the process of solving practical problems - navigate in the information space - show the level of development of analytical, research skills, practical skills and creative thinking. Can be performed individually or by a group of students 	Set of Control Assignments
	Case Study	A problem-focused task, in which the learner should understand a proposed real-life professionally-oriented situation and try to solve this problem.	Case Study Task
	Test	A system of standardized tasks for measuring the level of students' knowledge and skills automatically.	Set of Tests

Descriptors of the Manifestation of Motivation

Manifestations of motivation and activity	Descriptors of the manifestation of motivation
1. Academic discipline	The number of classes and consultations missed without a valid reason: no more than 1 for an "excellent" mark, no more than 3 for a "good" mark, no more than 6 for a "satisfactory" mark.
2. Responsibility for independent work and its quality	The number of shortcomings (failure to meet the rules and requirements for the report on the control work): no more than 1 for an "excellent" mark, no more than 3 for a "good" mark, no more than 6 for a "satisfactory" mark.
3. Punctuality, timeliness	Lagging behind the schedule for performing independent work: no more than 3 days for an "excellent" mark, no more than 7 days for a "good" mark, no more than 14 days for a "satisfactory" mark
4. Productivity	The number of completed independent work assignments for an "excellent" mark - all, for a "good" mark - 3/4, for a "satisfactory" mark - 1/2.
5. Interest in the subject	The number of times the student turns to the teacher with questions, independent initiatives, proposals of educational, scientific or project nature: at least 3 for an "excellent" mark, at least 1 for a "good" mark; for a "satisfactory" mark it is not required.

Criteria for Evaluating Multiple Choice Tests

Estimated Indicator	Necessary Amount of Points for getting :	
	Pass/Fail	Grade

	Test			
		Satisfactory	Good	Excellent
	55% and higher	55% and higher	70% and higher	85% and higher
Number of Questions :				
10	6	6 - 7	8 - 9	10
15	8	8 - 10	11 - 13	14 - 15
20	11	12 - 14	15 - 17	18 - 20
25	13	13 - 18	19 - 22	23 - 25

Criteria for Evaluating an Essay, a Report, a Control Paper

5 «Excellent»	<ul style="list-style-type: none"> - a full comprehensive answer is given; - deep knowledge of theoretical material is demonstrated; - remarkable ability to develop own arguments, make conclusions based on adequate evidence
4 «Good»	<ul style="list-style-type: none"> - an incomplete answer is given; - deep knowledge of theoretical material is demonstrated; - some mistakes are allowed if the student corrects mistakes by himself; - ability to develop own arguments, make conclusions based on adequate evidence with insignificant mistakes
3 «Satisfactory» (Pass)	<ul style="list-style-type: none"> - difficulty in presenting the answer; - incomplete theoretical justification; - difficulties in formulating conclusions.
2 «Unsatisfactory» (Fail)	<ul style="list-style-type: none"> - no answer or a wrong answer; - lack of theoretical knowledge

Criteria for Evaluation of Participation in a Case Study

5 ("excellent")	<ul style="list-style-type: none"> a comprehensive assessment of the proposed situation is given; deep knowledge is demonstrated of the theoretical material and the ability to apply it; consistent and correct execution of all tasks; the ability to reasonably state one's thoughts and draw the necessary conclusions.
4 ("good")	<ul style="list-style-type: none"> a comprehensive assessment of the proposed situation is given; deep knowledge is demonstrated of the theoretical material and the ability to apply it;

	<p>consistent and correct execution of all tasks;</p> <p>occasional errors are possible that are corrected by the student himself after the teacher's comment;</p> <p>the ability to reasonably state one's thoughts and draw the necessary conclusions.</p>
3 ("satisfactory")	<p>difficulties in comprehensive assessment of the proposed situation;</p> <p>incomplete theoretical justification, which requires suggestive questions from the instructor;</p> <p>execution of tasks with the instructor's prompt;</p> <p>difficulties in the formulation of conclusions.</p>
2 ("fail")	<p>incorrect assessment of the proposed situation;</p> <p>lack of theoretical justification for the tasks being performed</p>

Evaluation tools for monitoring students' current progress

TYPICAL TESTS:

1. Which tabs on the Ribbon is used to find in the document?

- a. Home Tab
- b. Insert Tab
- c. Review Tab.

2. Which option in File pull-down menu is used to close a file in MS Word?

- a. New
- b. Quit
- c. Close
- d. Exit

3. Which bar is usually located below that Title Bar that provided categorized options?

- a. Menu Bar
- b. Status Bar
- c. Tool Bar
- d. Scroll Bar

TOPICS OF REPORTS:

- 1) Abundant-data applications, algorithms, and architectures
- 2) Artificial intelligence and robotics
- 3) Bio-informatics and other uses of CS in biology, biomedical engineering, and medicine
- 4) Computer-assisted education
- 5) Databases, data centers, information retrieval, and natural-language processing
- 6) Emerging technologies for computing hardware, communication, and sensing
- 7) Human-computer interaction
- 8) Large-scale networking
- 9) Limits of computation and communication
- 10) Multimedia
- 11) Programming languages and environments
- 12) Security of computer systems and support for digital democracy
- 13) Verification, proofs, and automated debugging

CASE-STUDY. TOPIC - Computer Programs

HISTORICAL OVERVIEW

Phase 1: The 1950s and Early 1960s

Phase 2: Mid-1960s and 1970s

Phase 3: The 1980s

CURRENT LEGAL APPROACHES IN THE UNITED STATES

What's Not Controversial

Traditionalist Versus Strong Protectionist View of What Copyright Law Does and Does Not Protect in

Computer Programs

Controversy Over "Software Patents"

Nature of Computer Programs and Exploration of a Modified Copyright Approach

INTERNATIONAL PERSPECTIVES

Europe

Japan

Other Nations

FUTURE CHALLENGES

Advanced Software Systems

Digital Media

Networks

Patents and Information Infrastructure of the Future

Conflicts Between Information Haves and Have-Nots on an International Scale

TOPICS FOR INDEPENDENT WORK

- 1) Kids and Internet Safety (4 hours).
- 2) Visualizing and learning from public data sets (4 hours).
- 3) Development of interesting mobile phone apps (4 hours).
- 4) Develop or evaluate tools to facilitate student learning (4 hours).
- 5) Software-defined networking (SDN) (4 hours).
- 6) Internet of Things (IoT) security (4 hours).
- 7) Machine Translation (4 hours).
- 8) Automatic reasoning and inferencing (4 hours).
- 9) Technology for open government (4 hours).
- 10) Computer-generated drawings from 3D models (4 hours).
- 11) Tools for making visual art using computer graphics (4 hours).
- 12) New methods for computer animation (4 hours).
- 13) Techniques for medical visualization (4 hours).
- 14) Experiments where the data is collected via the internet (4 hours).

QUESTIONS FOR FINAL CONTROL

1. Explain the differences between the ways in which parallel and serial communication is carried out.
2. Apart from the widespread availability of USB (Universal Serial Bus) ports, explain why peripherals usually use a serial communication method such as USB instead of parallel communication.
3. What is meant by the term stored-program concept?
4. Explain the term low-level language.
5. Describe two differences between a compiler and an interpreter.
6. Explain what intermediate code is and why some compilers will produce intermediate code as the final output.
7. How to add foot-note & end note in word?
8. In MS word 2013 how you can create a user entry forms?
9. How you can restrict editing for someone in word 2013?
10. In what ways you can see the difference between two similar documents?
11. How to create forms in Word
- 12.
13. Which tool do you use to create a query object?
14. What is the purpose of indexing?
15. Which is the valid data type in Access?
16. How many relations may exist between tables in databases?
17. What is the full form of SQL?

18. Explain why browsing the Internet might be slower at a public hotspot in a coffee shop than at home on a wireless network.
19. Explain the role of a service set identifier (SSID) in wireless networking and why some network administrators turn off SSID broadcasting.
20. What is described by the phrase “Internet of Things”?
21. Explain why programs written in the JavaScript language, to be executed in a web browser, are interpreted rather than compiled.

7. Methodological and information support for the course

a. Main literature:

8. Hannes Werthner, Frank van Harmelen Informatics in the Future (2017)
<https://link.springer.com/book/10.1007/978-3-319-55735-9>

a. Additional literature:

1. Elijah Blessing Rajsingh, Anand Bhojan Informatics and Communication Technologies for Societal Development (2015) <https://link.springer.com/book/10.1007/978-81-322-1916-3>
2. Wenjiang Du Informatics and Management Science IV (2013)
<https://link.springer.com/book/10.1007/978-1-4471-4793-0>
3. Wenjiang Du Informatics and Management Science III (2013)
<https://link.springer.com/book/10.1007/978-1-4471-4790-9>

b. Internet resources

1. MSWindows 7 (лицензия на ГОУ ВПО ННГУ им. Лобачевского, идентификатор 47276400),
2. Microsoft Office 2007 Профессиональный + (лицензия на ГОУ ВПО ННГУ им. Лобачевского, идентификатор 47729513),
3. Kaspersky Endpoint Security 10 for Windows (лицензия на ГОУ ВПО ННГУ им. Лобачевского, № 1096-160712-081443-850-73)
4. The official web site of Federal State Statistics Service – URL: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/en/main/
5. The official web site of Government of Russian Federation – URL: <http://government.ru/en/>
6. The official web site of Organization for Economic Co-operation and Development (OECD) – URL: <http://www.oecd.org/>
7. The official web site of the Central Bank of Russian Federation – URL: <http://www.cbr.ru/eng/>
8. The official web site of the International Monetary Fund – URL: <http://www.imf.org/>
9. The official web site of the Ministry of Finance – URL: <http://old.minfin.ru/en/>
10. The official web site of the UNCTAD (United Nations Conference on Trade and Development) – URL: <http://www.unctad.org/>
11. The official web site of the World Trade Organization – URL: <http://www.wto.org/>
12. The official web site of World Bank – URL: <http://www.worldbank.org/>

8. Logistical support for the course

Special classrooms are used for conducting lectures and seminars, group and individual consultations, ongoing monitoring and intermediate certification, as well as for students' independent work. These rooms are equipped with specialized furniture and technical teaching aids for presenting

educational information to a large audience.

For lecture-type classes, sets of demonstration equipment and educational visual aids are offered to provide thematic illustrations that correspond to the program of a given subject.

Premises for students' independent work are equipped with computers that provide connection to the Internet and access to Lobachevsky University's electronic information and educational environment.

The program was compiled in accordance with the requirements of the Federal State Educational Standard for Higher Education and the Educational Program in the field of "International relations", the profile is "World politics".

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Reviewer:			

The program was approved at a meeting of the Methodological Commission of the on August 30, 2017, Protocol No. ____.