



Ministry of Education and Science of Ukraine

COMPUTER SCIENCE (INFORMATICS)

Optional compulsory course

Curriculum for comprehensive schools

Grades 10-11

Standard level

INFORMATICS
Optional compulsory course
 105 hours

BASIC MODULE 35 hours

The expected learning outcomes	Content of study material
Information technology in society	
<p><i>The knowledgeable component</i></p> <p>Knows the basic concepts of computer science, the components of an information system and their purpose.</p> <p>Understands the role of modern information and communication technology in society and human life</p> <p>Observes the rules of safe use of the Internet, understands the principles of information security.</p> <p>Is aware of the individual online learning platforms and uses them for learning</p> <p>Explains the principles of digital citizenship and e-governance.</p> <p>Has an understanding of the general principles and scope of artificial intelligence, internet of things, smart-technology and collective intelligence technology.</p> <p><i>The activity component</i></p> <p>Organizes activities using software tools to plan and structure work and collaborate with members of society.</p> <p>Uses digital citizenship technology to address their own social needs.</p> <p>Adheres to the rules of safe online behavior.</p> <p>Independently masters new technologies and means of activity.</p>	<p>Information, messages, data, information processes, information systems as important components and attributes of modern society</p> <p>Modern information technologies and systems. Man in the information society.</p> <p>Difficulties of information security. Internet threats and how to avoid them.</p> <p>Learning on the Internet. Professions of the future, analysis of trends in the labour market. The role of information technology in the work of the contemporary worker.</p> <p>Computer-assisted planning, performance and forecasting of learning, research and practice.</p> <p>Internet marketing and Internet banking.</p> <p>Electronic management systems.</p> <p>The concept of artificial intelligence, Internet of things, Smart-technologies and technologies of collective intelligence.</p>
Patterns and modelling. Data analysis and visualisation	
<p><i>The knowledgeable component</i></p> <p>Explains the concept of computer modelling and experimentation.</p> <p>Argues methods and tools for data visualization.</p> <p>Explains the concept of sampling and data.</p> <p>Evaluates the type of trend line from the data series.</p> <p>Knows formulas and methods of calculating basic statistical characteristics of a sample (arithmetic mean, mode, median, standard deviation).</p> <p>Knows the patterns and methods of realizing ordinary monetary calculations (amount of loan repayments, compound interest, etc.) In a spreadsheet environment.</p>	<p>Computer modelling of objects and actions. Computer experiment</p> <p>Fundamentals of statistical data analysis. Data series. Calculation of basic statistical characteristics of a sample.</p> <p>Visualization of data series and trends. Infographics.</p> <p>Solving equations, systems of equations, optimization problems.</p> <p>A software tool for complex calculations, data analysis and financial calculations.</p> <p>Problem solving from different subject areas.</p>

<p><i>The activity component</i></p> <p>Plans and carries out training studies and computer experiments on various subject areas.</p> <p>Uses and creates information models to solve problems in various subject areas by means of information technology.</p> <p>Can represent data series graphically.</p> <p>Can identify and graphically represent trends in a sample of data. Uses a variety of infographics to present data.</p> <p>Uses a spreadsheet processor to perform simple financial calculations.</p>	
Database management systems	
<p><i>The knowledgeable component</i></p> <p>Explains the concept of databases and database management systems and their purpose.</p> <p>Understands the concept of a table, a field, a record, a key, a link.</p> <p><i>The activity component</i></p> <p>Creates tables, enters and edits data in them, selects data types.</p> <p>Creates simple queries to select data, arranges and filters data in a table.</p>	<p>The concept of databases and database management systems and their purpose.</p> <p>Relational databases, their objects. Keys and foreign keys. Links between records and tables. Defining the type of connection.</p> <p>Creating tables. Entering and editing data of different types.</p> <p>Arrange, search, and filter data.</p> <p>Queries for selecting data.</p>
Multimedia and hypertext documents	
<p><i>The knowledgeable component</i></p> <p>Provides examples of systems for content management for web resources.</p> <p>Distinguishes between multimedia processing technologies</p> <p>Explains the application of different technologies in website development</p> <p>Provides examples of web site optimization and promotion strategies.</p> <p><i>The activity component</i></p> <p>Selects appropriate software and performs basic processing of audio and video data.</p> <p>Develops websites using automated content management tools.</p> <p>Uses hypertext, graphics, animation and multimedia elements on Web pages.</p> <p>Considers the artistic and aesthetic component in the</p>	<p>Multimedia processing technologies.</p> <p>Content management systems for web resources. Creating and administering a website.</p> <p>The concept of the markup language of a hypertext document.</p> <p>Ergonomics of placing information on the web page.</p> <p>The concept of search engine optimization and website promotion.</p> <p>The significance of electronic media in human life</p>

<p>development of information products.</p> <p>Adheres to the rules of ergonomic placement of materials on a web page.</p> <p>Plans own and group activities for the design and development of multimedia objects and websites.</p>	
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MODULES TO CHOOSE FROM

Graphic design 35 hours

Computer Animation 35 hours

3D modelling 35 hours

Mathematical Foundations of Computer Science 35 hours

Information security 17 hours

Web technologies 35 hours

Foundations of Electronic Document Management 17 hours

Databases 35 hours

Formal Logic 35 hours

Computer Aural Processing 35 hours

Creative programming 35 hours