Appendix 13
of Regulation No. 2 of the Government
of the Republic of 6 January 2011
National Curriculum for Upper Secondary Schools

Last amendment 29 August 2014

Optional Course: Bases of Inquiry

1. General principles

1.1. Learning and Educational Objectives

The optional course "Bases of Inquiry" aims at developing in students the following competencies:

1) setting objectives, formulating investigatory questions or hypotheses, controlling variables and assuming responsibility for the implementation of tasks;
2) planning and organising investigations while exhibiting collaborative and leadership skills;
3) identifying, comprehending and evaluating relevant publications, their sources of information; validity and reliability;
4) thinking creatively and independently; applying a systematic approach to undertaking investigations;
5) using different models information gathering; critically assessing the information these give; identification of risk and safety components;
6) obtaining an overview and experience of undertaking data collection, processing and analysis of findings and drawing conclusions;
7) formalising an investigatory project report using a computer in compliance with scientific, ethical, communicative and presentation quality requirements; and
8) presenting, assessing and substantiating the results of investigations.

1.2. Description of Optional Course

The optional course provides elementary knowledge about the essence of investigative work, its methods, stages, structure, formalisation and defence. The optional course consists of auditorium lectures and/or e-studies during which the aforementioned topics are covered. The individual study mode is used as well, with students compiling, in cooperation with supervisors, a research paper on a freely chosen field that includes an annotation in the native language and foreign language A, as well as a review of the investigative reports submitted by a fellow student.

Investigation is primarily a process with certain methods of work during which the selected problem is analysed systematically, appropriately and in a structured manner. The investigative report must be compiled in compliance with scientific, ethical, communicative and presentation quality requirements. The investigation topic must therefore be relevant and the contents of the investigative report must be

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unequivocally understandable. The principles of selectivity, consistency, precision and objectivity must be adhered to. The author must critically approach their viewpoints and those of others. All presented assertions must be supported with argumentation and rely on facts.

Compliance with scientific quality requirements in this course requires the presence of three distinct investigation components:
1) overview of the work already performed by others;
2) overview of own investigation results and applied methods; and
3) comparison of own results with those of others, with conclusions.

The investigative report is the concrete result of the investigation process: it is the written report that reflects the student's ability to think independently and which contains the student's viewpoints.

The optional course concludes with a public presentation (i.e. defence) of the investigation outcomes, during which the student must provide an overview structured as follows:
1) substantiation of topic choice;
2) investigation question/hypothesis and objective;
3) introduction of method(s) and structure, with substantiation where necessary;
4) brief content overview; and
5) research summary: what has been achieved and has the objective been reached.

The optional course is closely integrated with the native language, foreign language A and information technology courses and other courses that are directly related to the research topic. The investigative report compiled during the course can be used as the basis for practical work for an upper secondary school exam or course-specific research.

The optional course "Bases of Inquiry" requires the availability at the educational institution of internal research paper compilation guidelines establishing the structure of the investigative report, referencing and formalisation requirements, the tasks of the supervisor and reviewer and the assessment principles.

The output of the optional course is submission of investigation reports to various competitions, including national competitions such as students' scientific research papers (Archimedes Foundation), the environmental research competition (Ministry of Education and Science, GLOBE Programme in Estonia) and the "My Estonia" competition of students' historical research papers (Estonian Association of History Teachers).

1.3. Planning and Organisation of Learning Activities

The duration of the optional course is 35 hours. The school is free to set the number of auditorium hours and/or volume of independent work via an online learning environment for acquisition of theoretical basic knowledge within the framework of the "Bases of Inquiry" course. The course can be taught if research paper compilation guidelines are available to students. The guidelines must include an overview of the essence and structure of research work and establish the precise requirements for research formalisation, referencing and assessment and the tasks of the supervisor and the reviewer.

The following learning activities are organised to teach the optional course at the upper secondary school level in accordance with internal guidelines:

1) auditorium lectures and/or independent work via an online learning environment (VIKO, IVA, Moodle, Blackboard, etc.)   to acquire theoretical basic knowledge;
2) individual supervision;
3) research work topic selection and delimitation;
4) research work objective and hypothesis (if possible), research question formulation, establishment of research tasks and problem and selection of methods;
5) compilation of research work action plan with deadline;
6) independent work with various materials and sources, including electronic information searches and familiarisation with specialist literature;
7) critical analysis of information sources;
8) implementation of data collection, processing and analysis methods;
9) creation and analysis of tables, schemes and figures;
10) research paper formalisation on computer software in accordance with paper compilation guideline;
11) review and annotation (native language and foreign language A) compilation;
12) preparation for public presentation and defence of completed research paper; and
13) public presentation.

1.4. Physical Learning Environment

It is recommended that auditorium lectures and public presentations (defence) be organised in classrooms which have a computer connected to the Internet and a projector. Online e-studies are course to the availability of access to the corresponding learning environment.

The students can use the special resources available at the school that comply with safety requirements and ethical norms for experiments/trials. The school is under no obligation to provide any resources that the student might request for experiments/trials.

1.5. Basis for Assessment

The principles of assessment are set out in the research paper compilation guidelines. The following aspects are assessed:

1) content, including how the investigation report matches the topic, whether the objectives have been achieved, which methods were chosen and how they were applied;
2) form, including the balance between the synopsis of previous investigative work and the presentation of the author's work, the structure of the report, work with sources, linguistic propriety and the author's ability to express their thoughts;
3) process, including planning, adherence to the deadline and contact with the supervisor; and
4) public presentation (defence).

2. Course plan
2.1. Learning Outcomes and Learning Content

Learning Outcomes

At the end of the course the students are expected to have the capability to:

1) explain the methodology of reviewing investigatory reports and conducting independent investigations;
2) communicate with their supervisors and cope with constructive criticism;
3) recognise simpler sources in their chosen field find the necessary information and critically analyse it;
4) explain and carry out primary methods of collection of initial data for research (observation, experiment, survey, generalisation of experience, etc.);
5) process data by applying suitable statistical methods (median value calculation, correlation, etc.);
6) analyse investigation outcomes by applying suitable methods (comparison, ranking, analysis, synthesis, generalisation, etc.);
7) formalise investigation reports in compliance with scientific, ethical, communicative and presentation quality requirements and research paper compilation guidelines;
8) present and defend investigation outcomes both orally and in writing; and
9) provide constructive feedback about a fellow student's investigation report.

Learning Content

Essence of investigative work. Quantitative and qualitative investigation approaches. Investigation objectives and attributes. Definition of notions.

Methods of carrying out investigations. Types of methods and their selection. Existing data systems (official statistics, statistical databases, archived materials, earlier research materials and other document collections). Data collection methods (observation, experiment, measurement, interview, questionnaire survey, diary method, assessment scale, etc.). Data processing methods (median value calculation, correlation, etc.). Analysis methods (comparison, ranking, analysis, synthesis and generalisation).

Investigative work stages. Cooperation with supervisor. Topic selection and delimitation. Work with sources (electronic information searches and avoidance of source criticism and plagiarism). Initial work plan compilation. Hypothesis, research question formulation. Collection and analysis of material (facts). Scientific interpretation of investigative work and generalisation of its results. Written formalisation of conducted investigation.

Investigation structure. Title page. Table of contents. Introduction. Main part (sections and subsections). Conclusion. List of sources. Annexes. Review. Annotation (native language and foreign language A).

Tables and figures. Application scope. Formalisation requirements.

Style and language. Academic writing style. Readability and comprehensibility. Integrity and coherence. Sentence structure and vocabulary. Objectivity. Tenses. Lists. Use of abbreviations and numbers in text. Grammar.

References and formalisation. Quotations and synopses. In-text references. References in footnotes. List of sources (article, book, legislation, archived materials, electronic sources, documents without personal data, etc.).

Defence. Defence procedure: content and structure. Public presentation.