



Zvyšování kvality vzdělávání učitelů přírodovědných předmětů

Andris Broks – Prologue



LIFE EXPERIENCE
(knowledge,
attitudes (values),
skills)

FOR LIFE
(cognition,
consideration,
behavior) !

University of Latvia

**SYSTEMOLOGY
of EDUCATION**

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PROLOGUE – Full course description

This study course is designed to develop student's systems thinking abilities, providing them with unified theoretical understanding and comprehension of different systems as well as with practical experience on the basis of aim oriented processes of studies in the field of human's educational activities.

COURSE GOALS :

The student will be expected *to know* -

- philosophical and psychological background of systems theory and systemology;
- main notions and general principles of system theory;
- basic kinds of systems and most typical classifications of systems;
- main structures of educational systems and pedagogical activities.

The student will be expected *to be able* -

- demonstrate his/her skills of simple system analysis and synthesis;
- apply system theory in problem solving, project design and decision making;
- use systems approach in planning of different aim oriented processes;
- observe, understand and comprehend the hierarchical structures of most popular substantial (natural, technical), social and informational systems.

The student will be expected *to show his/her attitude* -

- towards the recent developments of political, economic and educational systems;
- towards the research and development in systemology today and tomorrow;
- towards the role of systemic thinking in people's life and education.

PERFORMANCE REQUIREMENTS :

1. Define main notions and its structures when characterizing world and human.
2. Discuss the universal cycle of human's action - cognition, consideration, behavior.
3. Discuss the informational aspect of human's spiritual life (spirit as information).
4. Define systemology and discuss relations between notions of order/disorder and causality.
5. Provide a glossary of fundamental notions (concepts) in systems theory.
6. Compare different areas of research and technology in order to show the universal mechanism of systems thinking.
7. Discuss hierarchy in classifications of systems from the viewpoint of system analysis and synthesis.
8. Provide examples of systems approach in your field of interests and discuss the effectiveness and efficiency of reasonable use of systems thinking.
9. Compare and discuss different theories of systems (general as well as special theories in your field of interests), provide the general mainframe for them.
10. Define the general systemic background of educational activities and provide the systemic glossary of main concepts (notions) in education.
11. Discuss structure of the quality of education and compare understanding as well as comprehension as systemic notions in different countries, societies, situations.
12. Provide functional structure of your state system of education as well as main structure of the content of general education in your country and compare them with those in other countries.
13. Discuss the proposed study course according to the good will to insure the development of systems thinking, define your personal attitude towards the studies and your achievement.

COURSE STRUCTURE

INTRODUCTION (invitation to systems thinking – let us think about thinking)

PART 1. WORLD AND HUMAN (world, human, society, life)

1.2. Human in World

1.2. World in Human (systemic organization and functioning of human consciousness)

1.3. Universal structure of human purposeful actions

PART 2. FUNDAMENTALS OF SYSTEMS THEORY

2.1. Basic principles of systems theory

2.2. Scientific research of systems

PART 3. SYSTEMIC RESEARCH AND DEVELOPMENT OF EDUCATION

- 3.1. Changes (reforms and transformations in life and education
- 3.2. Universal functional structure of educational systems.
- 3.3. Stages, kinds and target groups of education.
- 3.4. Educatedness as systemic characteristic of the person's gained education
- 3.5. Educational programs and standards
- 3.6. Systemic development of educational content and methods (didactics and pedagogy) in Science Education

CONCLUSION (evaluation of the course)

ASSESSMENT :

Students are required to fulfill all Performance Requirements and respond to each of them in a typed form (written reports). Formal copying of the material presented in the Recommended Texts (copy-paste technology) will not be accepted. Final study progress report (course paper) means creative systemic synthesis of answers to all Performance Requirements with a special attention to the last one of them. Upon completion, the course paper is sent to the assigned professor (retaining a copy for your own records).

RECOMMENDED TEXT :

A.Broks. IZGLĪTĪBAS SISTEMOLOĢIJA. - Rīga, RaKa, 2000 (175 lpp.). [A.Broks. *Systemology of Education*. - Riga, RaKa, 1999 (175 p. - in Latvian)].

A.Broks. SISTĒMAS AP MUMS UN MĒS SISTĒMĀS. - Rīga, "Zinātne", 1988 (94 lpp.). [A.Broks. *SYSTEMS AROUND US AND WE IN SYSTEMS*. - Riga, "Zinātne", 1988 (94 p. - in Latvian)].

A.Broks. Selected study materials in English : <http://blogi.lu.lv/broks/>

INVITATION TO SYSTEMS THINKING. This study material is very close to the recommended original texts in Latvian and can replace them.

RECOMMENDED REFERENCES :

- Agoshkova, E.B., Systems thinking in the twenty-first century.
- < <http://web.bu.edu/wcp/Papers/TKno/TKnoAgos.htm> > (accessed 25.01.09)
- J.B.Best. COGNITIVE PSYCHOLOGY. - West Publishing Company, 1989 (583 p.)
- B.Richmond, S.Peterson. INTRODUCTION TO SYSTEM THINKING, 1996.
- D.F.Halpern. THOUGHT AND KNOWLEDGE : AN INTRODUCTION TO CRITICAL THINKING. Third edition. - Lawrence Erlbaum Associates, Publishers, Mahwah, New Jersey, 1996.
- Draper L.Kauffman, Jr. INTRODUCTION TO SYSTEM THINKING, 1994.
- W.Harman. GLOBAL MIND CHANGE: THE PROMISE OF THE 21st CENTURY. - Berret-Koehler Publishers, Inc. and Institute of Noetic Sciences, 1998 (208 p.).