Government of Russian Federation

Federal State Autonomous Educational Institution of High Professional Education

«National Research University Higher School of Economics»

Department of Psychology

Syllabus for the course
«Thinking and emotional modulation of cognition»

37.04.01 «Cognitive sciences and technologies: from neuron to cognition», Master of Science

Authors:

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Approved by:

Recommended by:

Moscow, 2015

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Summary

"Thinking and emotional modulation of cognition" is an elective course focusing on two important fields of cognitive psychology, thinking and the interaction between cognition and emotion designed for the Master Program "Cognitive sciences and technologies: from neuron to cognition". Cognitive studies of the last decades have revealed an important role of emotion in every aspect of human cognition. The rapid development of this field makes it necessary to know basic theories and main empirical evidence concerning the interplay between emotional and cognitive processes.

The course consists of two major parts: (1) Thinking and (2) Emotional modulation of cognition. The first part includes an overview of classical and modern approaches to the studies of problem solving processes. Then we will talk about difficulties of human thinking research and existing empirical and experimental methods. Some principal theoretical frameworks will be discussed in the last fraction of the first part of the course. The second part starts with the brief introduction to the modern psychology of emotion. Then follows an overview of the research on cognition and emotion. The subsequent topics cover the role of emotion in attention, memory, decision making, and creative thinking. The main issues of the research on emotion perception are discussed in the last topic.

The course "Thinking and emotional modulation of cognition" is a new and unique discipline within the educational programs of the National Research University Higher School of Economics. The course is based on the contemporary scientific research in cognitive science, emotion studies, and related areas. The course is essential in training competent specialist in the areas of cognitive sciences and technologies.

The authors and teachers of the course are Vladimir Spiridonov and Dmitry Lyusin, researchers of the Laboratory of Cognitive Science of the National Research University Higher School of Economics. Both authors have significant teaching experience including reading the related courses such as “Psychology of Cognition”, “Psychology of Thinking”, “Affective Modulation of Cognitive Processes”, and “Modern Psychology of Emotion”. The course implements several innovative teaching techniques including group discussions of cutting-edge research in the field and the development of new experimental designs by students.

1. Scope of Use

The present program establishes minimum demands of students’ knowledge and skills, and determines content of the course.

The present syllabus is aimed at department teaching the course, their teaching assistants, and students of the Master of Science program 37.04.01 «Cognitive sciences and technologies: from neuron to cognition».

This syllabus meets the standards required by:

- Educational standards of National Research University Higher School of Economics;
- Educational program «Psychology» of Federal Master’s Degree Program 37.04.01, 2014;
- University curriculum of the Master’s program in psychology (37.04.01) for 2014.

2. Learning Objectives

Learning objectives of the course "Thinking and emotional modulation of cognition" are to introduce students to the research on thinking and on cognition and emotion, to show the connections of these fields with other branches of cognitive science:
• The principal approaches to the understanding of human thinking
• The main theoretical explanations of problem solving processes
• The most important evidence of the role of emotion in cognitive processes
• The main theoretical explanations of the interactions between cognition and emotion

3. Learning outcomes

After completing the study of the course "Thinking and emotional modulation of cognition" the student should:

• Know basic notions and definitions used in the studies of thinking and emotional modulation of cognition.
• Know the key methods used in the studies of thinking and emotional modulation of cognition.
• Know the main theoretical approaches to the conceptualization of human thinking.
• Know the main heuristics and heuristic strategies used in problem solving.
• Know the basic emotional phenomena that play important role in cognitive processing.
• Possess skills for choosing appropriate neuroscience methods for psychological research.
• Possess skills for analyzing and developing experimental designs for studying emotion-cognition interactions and problem solving processes.

After completing the study of the discipline "Thinking and emotional modulation of cognition" the student should have the following competences:

<table>
<thead>
<tr>
<th>Competence</th>
<th>Code (UC)</th>
<th>Code (SC)</th>
<th>Descriptors (indicators of achievement of the result)</th>
<th>Educative forms and methods aimed at generation and development of the competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ability to reflect on the methods of activity studied.</td>
<td>CK-1</td>
<td>CK-M 1</td>
<td>The student is able to reflect on the methods of activity studied based on main approaches of experimental cognitive psychology.</td>
<td>Seminars</td>
</tr>
<tr>
<td>The ability to propose a model to invent and test methods and tools of professional activity.</td>
<td>SC-2</td>
<td>SC-M2</td>
<td>The student is able to propose a model to invent and test methods of cognitive psychology.</td>
<td>Lectures and tutorials, seminars</td>
</tr>
<tr>
<td>The ability to improve and develop intelligent and cultural level, to build track of professional development and career.</td>
<td>SC-4</td>
<td>SC-M4</td>
<td>The student is able to improve and develop intelligent and cultural level, to build track of professional development and career based on the knowledge of cognitive psychology.</td>
<td>Lectures</td>
</tr>
<tr>
<td>The ability to analyze, verify and assess the completeness of information during professional activity and work under ambiguity.</td>
<td>CK-6</td>
<td>CK-M6</td>
<td>The student is able to analyze, verify and assess the completeness of information to solve neuroscience problems.</td>
<td>Tutorials, presentations, tests.</td>
</tr>
<tr>
<td>The ability to conduct professional (including research) activity in international environment.</td>
<td>SC-8</td>
<td>SC-M8</td>
<td>The student is able to conduct professional (including research) activity in international environment regarding main concepts cognitive psychology.</td>
<td>Tutorials, presentations, tests.</td>
</tr>
<tr>
<td>Capability to organize independent scientific, research, consulting and applied activity on the basis of juridical and professional standards and duties.</td>
<td>PC-1</td>
<td>ИК-M1.2п/н/и/к/pr_6.1</td>
<td>The student is able to organize independent scientific, research, consulting and applied activity on the basis of juridical and professional standards and duties.</td>
<td>Lectures, group discussion.</td>
</tr>
<tr>
<td>The ability to communicate orally and in written form in English in the frame of professional and scientific intercourse.</td>
<td>ПК-2</td>
<td>ИК-M2.1_2.2_2.4.1_2.4.2</td>
<td>The student is able to discuss problems of neurosciences both orally and in written form.</td>
<td>Seminars, tests.</td>
</tr>
</tbody>
</table>
### Syllabus for the course «Thinking and Emotional Modulation of Cognition» for 37.04.01 «Cognitive sciences and technologies: from neuron to cognition», Master of Science

<table>
<thead>
<tr>
<th>The ability to use modern IT technologies for search and processing of information, work with professional databases and net communication.</th>
<th>PC-4</th>
<th>IC-M4.1_4.3_4.4</th>
<th>The student is able to use modern IT technologies for search and processing of information, work with professional databases and net communication to solve the cognitive psychology problems.</th>
<th>Seminars, tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ability to describe the problems and situations of the professional activity using the language and the apparatus of the humanitarian, economical and social sciences for solving problems at the intersection of scientific fields, in related professional fields.</td>
<td>ПК-5</td>
<td>ИК-M5.3_5.4_5.6_2.4.1</td>
<td>The student is able to use the language and terminology of neuroscience in conjunction with psychological language and terminology.</td>
<td>Seminars, tests.</td>
</tr>
<tr>
<td>The ability to detect, transmit common goals in the professional and social activities.</td>
<td>PC-8</td>
<td>SPC-M3</td>
<td>The student is able to detect, transmit common goals in the field of the cognitive psychology.</td>
<td>Discussion and analysis of the results of the home task and individual work</td>
</tr>
</tbody>
</table>

### 4. Place of the discipline in the Master’s program structure

The course "Thinking and emotional modulation of cognition" is an elective course in the Master’s program "Cognitive sciences and technologies: from neuron to cognition".

**Prerequisites:**

The course is based on the knowledge in general psychology and cognitive science. The following knowledge and competence are required to study the discipline:

- A good command of English language.
- Basic computer skills.

Main competences developed after completing the study of this course are required for other disciplines of the Master's Program "Cognitive sciences & technologies: from neuron to cognition", 
National Research University Higher School of Economics
Syllabus for the course «Thinking and Emotional Modulation of Cognition» for 37.04.01 «Cognitive sciences and technologies: from neuron to cognition», Master of Science

including the research seminar “Cognitive sciences”, science and research internship, and the completion of the graduation thesis.

5. Thematic Plan of the Course

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Total hours</th>
<th>Class hours</th>
<th>Self-study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lectures</td>
<td>Seminars</td>
</tr>
<tr>
<td>Part 1. Thinking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Thinking phenomena and operational definitions of thinking</td>
<td>15</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1.2</td>
<td>Research methods in the psychology of thinking</td>
<td>7</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1.3</td>
<td>Theoretical approaches to problem solving processes</td>
<td>16</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>1.4</td>
<td>Thought and Language</td>
<td>16</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>1.5</td>
<td>Expertise</td>
<td>18</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Part 2. Emotional modulation of cognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Introduction to human emotions</td>
<td>12</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2.2</td>
<td>Cognition and emotion: An overview</td>
<td>12</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2.3</td>
<td>Mood effects on cognition</td>
<td>12</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2.4</td>
<td>Attention and emotion</td>
<td>10</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2.5</td>
<td>Memory and emotion</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2.6</td>
<td>Decision making, creative thinking and emotion</td>
<td>8</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>2.7</td>
<td>Perception of emotions</td>
<td>10</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Total: 144 22 42 80

6. Requirements and Grading

Two parts of the course will be graded separately. The final grade will be the sum of the two grades received for the each part of the course.

<table>
<thead>
<tr>
<th>Part of the course</th>
<th>Type of grading</th>
<th>Type of work</th>
<th>2\textsuperscript{nd} year</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1 “Thinking”</td>
<td>Continuous</td>
<td>Mid-term control test</td>
<td>*</td>
<td>Test in a written form, 30 minutes.</td>
</tr>
<tr>
<td></td>
<td>Final</td>
<td>Analytical essay</td>
<td>*</td>
<td>Individual analytical essay (about 1500 words) should be completed till 16.10.15</td>
</tr>
<tr>
<td>Part 2 “Emotional modulation of cognition”</td>
<td>Continuous</td>
<td>Mid-term control test</td>
<td>*</td>
<td>Test in a written form, 30 minutes.</td>
</tr>
<tr>
<td></td>
<td>Final</td>
<td>Exam</td>
<td>*</td>
<td>Oral exam. Preparation time 30 minutes.</td>
</tr>
</tbody>
</table>

6.1. Course Grading Criteria

Continuous assessment: Mid-term control tests are written assignments involving open questions and two-choice questions. Each correct answer adds one point. The grade is calculated as
the proportion of correct answers to the total number of questions (for multiple-choice questions). The grade is calculated as the proportion of correct answers exceeding half of the total number of questions to half the total number of questions (for two-choice questions).

<table>
<thead>
<tr>
<th>Ten-point grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – not accepted</td>
<td>Less 5%, or the test was not taken</td>
</tr>
<tr>
<td>1 – very bad</td>
<td>Not less than 5, but less than 15%</td>
</tr>
<tr>
<td>2 – bad</td>
<td>Not less than 15, but less than 25%</td>
</tr>
<tr>
<td>3 – no pass</td>
<td>Not less than 25, but less than 35%</td>
</tr>
<tr>
<td>4 – pass</td>
<td>Not less than 35, but less than 45%</td>
</tr>
<tr>
<td>5 – highly pass</td>
<td>Not less than 45, but less than 55%</td>
</tr>
<tr>
<td>6 – good</td>
<td>Not less than 55, but less than 65%</td>
</tr>
<tr>
<td>7 – very good</td>
<td>Not less than 65, but less than 75%</td>
</tr>
<tr>
<td>8 – almost excellent</td>
<td>Not less than 75, but less than 85%</td>
</tr>
<tr>
<td>9 – excellent</td>
<td>Not less than 85, but less than 95%</td>
</tr>
<tr>
<td>10 – perfect</td>
<td>Not less than 95% and greater</td>
</tr>
</tbody>
</table>

Analytical essay is the form of the final assessment of the first part of the course. Students have to demonstrate the knowledge of theories and facts in the psychology of thinking. They should be able to demonstrate the ability to analyze important articles in the field of the psychology of thinking, to find methodological controversies and inconsistencies in experiments. Students should demonstrate the ability to appropriately use scientific terms in the studied field.

Final assessment of the second part is the final exam. Students have to demonstrate the knowledge of theories and facts in the psychology of emotional modulation of cognition. Students should be able to demonstrate the ability to analyze important topics and problems in the psychology of emotional modulation of cognition, to understand relations between course topics and with knowledge of other related fields. Students should demonstrate the ability to appropriately use scientific terms in the studied field.

The final exam grading criteria are:
1. Compliance of the answer to the current question topic;
2. Sufficient volume of knowledge on the current question topic;
3. Ability to understand and discuss other topics within the course scope relevant to the current question topic;
4. Ability to logically organize the answer and to present evidence in adequate order;
5. Ability to correctly use scientific terms within the course scope.

<table>
<thead>
<tr>
<th>Ten-point grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – not accepted</td>
<td>No answer</td>
</tr>
<tr>
<td>1 – very bad</td>
<td>No criteria met</td>
</tr>
<tr>
<td>2 – bad</td>
<td>Less then 2 criteria met</td>
</tr>
<tr>
<td>3 – no pass</td>
<td>Less then 3 criteria met</td>
</tr>
<tr>
<td>4 – pass</td>
<td>At least 3 criteria are partially met</td>
</tr>
<tr>
<td>5 – highly pass</td>
<td>At least 3 criteria are met</td>
</tr>
<tr>
<td>6 – good</td>
<td>At least 4 criteria are partially met</td>
</tr>
<tr>
<td>7 – very good</td>
<td>At least 4 criteria are met</td>
</tr>
<tr>
<td>8 – almost excellent</td>
<td>All criteria are met.</td>
</tr>
<tr>
<td>9 – excellent</td>
<td>All criteria are met, and at least 3 criteria are fully met.</td>
</tr>
<tr>
<td>10 – perfect</td>
<td>All criteria are fully met</td>
</tr>
</tbody>
</table>
6.2. The cumulative grade formulae

The final grade is calculated as the mean of the grades given for each part of the course:

\[ G_{\text{final}} = (G_{\text{Part1}} + G_{\text{Part2}}) / 2 \]

The grades for each part (\( G_{\text{Part1}} \) and \( G_{\text{Part2}} \)) are calculated according to the following algorithm.

The current grade (\( G_{\text{current}} \)) is given by the teacher as an average grade for two mid-term control tests.

The class grade (\( G_{\text{class}} \)) is given by the teacher for attendance and activity during class hours.

The self-study grade (\( G_{\text{self-study}} \)) is given by the teacher for the results of self-studies, which are assessed by written tests.

The cumulative grade (\( G_{\text{cumulative}} \)) for a student’s achievements during the course is calculated by the end of the course on the basis of the current grade, the class grade, and the self-study grade:

\[ G_{\text{cumulative}} = 0.4 \times G_{\text{current}} + 0.3 \times G_{\text{class}} + 0.3 \times G_{\text{self-study}}. \]

The examination grade (\( G_{\text{exam}} \)) is given by the teacher during the final examination.

The resulting grades for each part (\( G_{\text{Part1}} \) and \( G_{\text{Part2}} \)) are calculated on the basis of the cumulative grade and the examination grade, e.g.:

\[ G_{\text{Part1}} = 0.6 \times G_{\text{cumulative}} + 0.4 \times G_{\text{exam}} \]

The grades are rounded up arithmetically.

If the cumulative grade of a student equals 8, 9 or 10, the student can opt that the grade for this part of the course be given equal to the cumulative grade, e.g.:

\[ G_{\text{Part1}} = G_{\text{cumulative}} \]

If the student is eligible for this option, he/she has to inform the teacher about his/her decision concerning the final grade before the examination.

The examination grade for each part is blocking: if the examination grade is 1, 2 or 3 (unsatisfactory, fail), then the final grade equals to the examination grade, e.g.:

\[ G_{\text{Part1}} = G_{\text{exam}} \]

### Table of Grade Correspondence

<table>
<thead>
<tr>
<th>Ten-point Grading Scale</th>
<th>Five-point Grading Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - very bad</td>
<td>Unsatisfactory - 2</td>
</tr>
<tr>
<td>2 – bad</td>
<td>FAIL</td>
</tr>
<tr>
<td>3 – no pass</td>
<td>PASS</td>
</tr>
<tr>
<td>4 – pass</td>
<td></td>
</tr>
</tbody>
</table>
The final grade, which is the resultant grade for the course, goes to the certificate of Master’s degree.

7. Course Content

PART 1. THINKING

Topic 1.1. Thinking phenomena and operational definitions of thinking


Classes: 7 hours
Self-study: 8 hours

Reading

Topic 1.2. Research methods in the psychology of thinking

Empirical and experimental research methods of human thinking.

Classes: 3 hours
Self-study: 4 hours

Reading

Topic 1.3. Theoretical approaches to problem solving processes

Main theoretical ideas in the field: classical theories and modern trends. Problem space theory (Newell, Simon) as a paradigm in the psychology of problem solving.

Classes: 8 hours
Self-study: 8 hours

Reading
Topic 1.4. Language and thought
The impact of language on thought. Thinking peculiarities of bilinguals.

*Classes: 6 hours  
Self-study: 10 hours*

**Reading**

Topic 1.5. Expertise

*Classes: 8 hours  
Self-study: 10 hours*

**Reading**

**PART 2. EMOTIONAL MODULATION OF COGNITION**

Topic 2.1. Introduction to Human Emotions
Definition of emotions. Components of emotions. Categorical and dimensional approaches to the classification of emotions. Core affect.
Overview of psychological theories of emotion. The controversy between the theories of basic emotions and the constructivist approach.

*Classes: 4 hours  
Self-study: 8 hours*

**Reading**

Topic 2.2. Cognition and Emotion: An Overview
Brief historical overview of the field. Early studies of the role of emotion in information processing.
Main theoretical frameworks. Associative network model. Emotion as information. Broadening and narrowing of cognition. Selective encoding of emotional information

*Classes: 4 hours*
Self-study: 8 hours

Reading

**Topic 2.3. Mood Effects on Cognition**

Classes: 4 hours
Self-study: 8 hours

Reading

**Topic 2.4. Attention and Emotion**
Experimental paradigms used in the research of attention and emotion: attentional cueing, visual search, emotional Stroop task, attentional blink, eye tracking. Main results and theoretical interpretations.

Classes: 6 hours
Self-study: 4 hours

Reading

**Topic 2.5. Memory and Emotion**

Classes: 4 hours
Self-study: 4 hours

Reading

**Topic 2.6. Decision Making and Creative Thinking, and Emotion**

Emotional impact on judgment and decision making: integral and incidental emotions, influences on content of thought and depth of thought, goal activation.


*Classes: 4 hours*

*Self-study: 4 hours*

**Reading**


**Topic 2.7. Perception of Emotions**


*Classes: 6 hours*

*Self-study: 4 hours*

**Reading**


**8. Educational Technology**

The following educational technologies are used in the study process:

- Lectures involving continuous use of multimedia presentations and educational movies
- Seminars involving team oral discussions
- Tests, including two-choice tests
- Self-study of presentation
- Self-study of recommended literature

**Recommendations for course lecturer**

Course lecturer is advised to use interactive learning methods, which allow participation of the students, such as discussions. It is also expected that multimedia presentations and video materials will be intensively used for the study process.
Recommendations for Students
Students are required to study the presentations, which will be posted on the LMS educational portal, and the recommended reading. Students are required to actively participate in oral discussions during seminars and to take all tests.

9. Grading

9.1. Sample test questions:
Decide whether the statement is true or false:
2. According to Isen’s studies, positive mood hampers creative thinking.
3. Emotional Stroop effect is used for the exploration of emotion modulation of attention.

9.2. Questions for the analytical essay work:
Students will be provided with the experimental articles on problem solving from the APA journals and should answer three questions in written form about one of them:
1) What research has been done (theoretical ideas, hypothesis, experimental design, results, and conclusion)?
2) What “threats” of validity can you find in it?
3) How do the results relate to the «problem space theory» (a paradigm in this field)?

9.3. Sample final exam questions:
1. Affect infusion model.
2. Main experimental paradigms used in the research of attention and emotion.

10. Reading and Materials


*All books are available in electronic form. All papers are available in the HSE library.*

10.1. **Course telemaintenance**
All materials of the discipline are posted in informational educational milieu of NRU HSE LMS ([http://lms.hse.ru](http://lms.hse.ru)). The materials are made available for students progressively through the course studies.

11. **Equipment**
The course requires a computer or laptop, projector, and acoustic systems for multimedia presentations and video.