Government of Russian Federation

Federal State Autonomous Educational Institution of High Professional Education
«National Research University Higher School of Economics»

School of Linguistics
Master's programme 'Linguistic Theory and Language Description'

Syllabus for the course 'Instrumental Phonetics'

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Approved by the meeting of the School of Linguistics, Faculty of Humanities
on 30 May, 2016
Head of the School of Linguistics . . . . . E. V. Rakhilina

Recommended by the meeting of the Master Program Academic Council
resolution № 1, on 31 August, 2016

Approved by the head of the Master Program Academic . . . . . M. A. Daniel
on 31 August, 2016

Moscow, 2016

1. Scope of Use

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

The present syllabus is aimed at the lecturers teaching the course, their teaching assistants, and students of the Bachelor's programme Fundamental and Computational Linguistics.

This syllabus meets the standards required by:

- Educational standards of the National Research University Higher School of Economics;
- University curriculum for the area of studies 'Linguistic Theory and Language Description' for the academic year 2016/2017.

2. Learning Objectives

Learning objectives of the course 'Instrumental Phonetics' are to introduce students to:

- theoretical apparatus, key notions, and main principles of articulation and acoustic phonetics;
- the logic of articulation and acoustic analysis of sounds patterns of languages;
- instrumental methods of the phonetic analysis (including computer programming);
- critical thinking and reasoning within articulation and acoustic analysis.

3. Learning Outcomes

After completing the study of the discipline 'Instrumental Phonetics' students should:

- understand the principles of articulation and acoustic phonetics
- be able to read and critically assess current phonetic literature;
- be able to make empirical observations and theoretical generalizations;
- to apply their knowledge of the essentials of Instrumental Phonetics to various research problems in both Phonetics and Phonology.

4. Schedule

Topic	Lectures	Seminars	Students' work	Total
1. Articulatory Phonetics	2		6	8
2. Acoustic phonetics	2		6	8
3. The Tools of Phonetics	2		6	8
4. Computer programs for speech analysis	2		6	8
5. Speech analysis				
5.1 Vowels		2	8	10
5.2 Fricatives		2	4	6
5.3 Stops and affricates		2	4	6
5.4 Nasals and laterals		2	4	6
5.5 Suprasegmentals		2	4	6
6. Scripting		2	8	10
Total	8	12	56	76

5. Assessment and Grading

Cumulative grade for the student's work during the module is the mean scores for homework assignments. The assessment consists of final assessment is the final exam. Final course mark is obtained from the following formula:

$$\text{Final Mark} = 0.6 \times (\text{Cumulative Grade}) + 0.4 \times (\text{Exam})$$

The grades are rounded in favour of examiner/lecturer with respect to regularity of class and home works. All grades, having a fractional part greater than 0.5, are rounded up. All grading scales are summed up in following table:

Grading Scale		
ten-point	five-point	
1 — very bad	2 — no pass	FAIL
2 — bad		
3 — no pass		
4 — pass	3 — pass	PASS
5 — highly pass		
6 — good	4 — good	
7 — very good		
8 — almost excellent	5 — excellent	
9 — excellent		
10 — perfect		

6. Course Description

6.1 Articulatory phonetics

The role of the lungs, the larynx and the vocal folds in speech production. Vocal tract formation. Special types of phonation. Pitch. The vocal tract modifications during production of different types of sounds. Complex consonants. Coarticulation.

6.2 Acoustic phonetics

Basic Acoustics. Types of sounds. Acoustic Filters. The Acoustic Theory of Speech production. Acoustic properties of different types of sounds.

6.3 The Tools of Articulatory and Acoustic Phonetics

Tools of Articulatory and Acoustic Phonetics: Video and audio, magnetic resonance imaging, positron emission tomography, electroencephalography, endoscopy, x-ray film, ultrasound, electropalatography, x-ray microbeam, optotrack

6.4 Computer programs for speech analysis

Introducing Praat, Speech Analyzer, ELAN.

6.5 Speech analysis

Introducing articulation and acoustic features of vowels, fricatives, stops, affricates, nasals, laterals and suprasegmentals.

6.6 Scripting

Working with simple Praat scripts.

7. Educational Technology

The following educational technologies are used in the study process:

- group discussion and analysis of the results of home reading;
- group discussion and analysis of task problems;

8. Equipment

The course requires a laptop for each student and a laptop, projector, and acoustic systems during the lectures.

References

Ashby, M., J. Maidment (2005). *Introducing phonetic science*. Cambridge University Press.

Bickford, A. C., R. Floyd (2006). *Articulatory Phonetics: Tools for Analyzing the World's Languages*. SIL International.

Boersma, P., D. Weenink (2013). Praat: doing phonetics by computer (version 5.3.51)[computer program]. retrieved 2 june 2013.

Fant, G. (1971). *Acoustic theory of speech production: with calculations based on X-ray studies of Russian articulations*, Volume 2. Walter de Gruyter.

Fuchs, S., M. Toda„ M. Żygis (2010). *Turbulent sounds: an interdisciplinary guide*, Volume 21. Walter de Gruyter.

Fulop, S. (2011). *Speech spectrum analysis*. Springer Science & Business Media.

Gick, B., I. Wilson„ D. Derrick (2012). *Articulatory phonetics*. John Wiley & Sons.

Gordon, M., P. Ladefoged (2001). Phonation types: a cross-linguistic overview. *Journal of Phonetics* 29(4), 383–406.

Harrington, J. (2010). *Phonetic analysis of speech corpora*. John Wiley & Sons.

Johnson, K. (2011). *Acoustic and auditory phonetics*. John Wiley & Sons.

Ladefoged, P., S. F. Disner (2012). *Vowels and consonants*. John Wiley & Sons.

Ladefoged, P., I. Maddieson. (1996). *The Sounds of the World's Languages*. Oxford, Cambridge: Blackwell Publishers.

Rorabaugh, C. B. (2010). *Notes on Digital Signal Processing: Practical Recipes for Design, Analysis and Implementation*. Prentice Hall.