

Advances in Voice Analysis and Characterization

2014/2015

Codi: 101709

Crèdits: 6

Titulació	Tipus	Curs	Semestre
2500893 Logopèdia	OT	4	2

Professor de contacte

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Utilització de llengües

Llengua vehicular majoritària: anglès (eng)

Grup íntegre en anglès: No

Grup íntegre en català: No

Grup íntegre en espanyol: No

Equip docent

David Garcia Quintana

Neus Calaf Gozalo

Prerequisites

It is highly recommended that students enrolling in the course passed with decent marks, and enjoyed, the courses Física Acústica i Audiologia (1st year), and Alteracions de la Veu: Valoració i Intervenció (2nd year).

Both 3rd year and 4th year students are welcome.

The course lingua franca is English. An effort to personalize oral communication to each student's or group level will be attempted (English/Catalan). However, all handouts will be in English.

As part of Voice Therapy specialization, we strongly recommend to enroll to the course Educació de la veu i la seva salut.

Objectius

The global objective of the course is for the student to acquire specialized skills in integrated perceptual and acoustic analysis of human voice, both healthy and pathological, as part of an advanced training as future voice therapists.

This is not a course on spectral analysis for old fashioned voice therapists who will, anyway, continue to rely on their ears only. Along the course, students will practically experience that the integrated use of perceptual and acoustic analysis in their professional practice makes a real difference, both by mutually confirming the evaluation, and, when necessary, by solving the uncertainties due to the limitations of classical perceptive evaluation. Upon successful completion of the course, our students should comfortably master perceptive and acoustic analysis equally.

In particular, the student will:

- Reach an in-depth understanding of human voice, the different qualities of voice timbre associated with voice handicap or pathology, and those related with optimized efficiency strategies for voice users.

- Train her perceptive skills in voice evaluation, and master the powerful spectral tools available for acoustic analysis.
- Acquire skills to modify and analyze their own voice, self-implementing the different strategies available to the voice therapist. Understanding one's own voice as starting point to understand the users' voices.
- Practice thoroughly, working with plenty of real cases, the complete process of integrated evaluation and intervention as potential voice therapist-to-be.

Competències

- Analitzar i sintetitzar informació.
- Comprendre, interpretar i expressar oralment i per escrit continguts propis de l'àmbit de la salut en una llengua estrangera.
- Demostrar que es comprenen els trastorns de la comunicació, el llenguatge, la parla, l'audició, la veu i les funcions orals no verbals.
- Desenvolupar un pensament i un raonament crítics i saber comunicar-los de manera efectiva, tant en les llengües pròpies com en una tercera llengua.
- Generar propostes innovadores i competitives en la recerca i en l'activitat professional.
- Utilitzar les tècniques i els instruments d'exploració propis de la professió i registrar, sintetitzar i interpretar les dades aportades integrant-les al conjunt de la informació.
- Valorar de manera crítica les tècniques i els instruments d'avaluació i diagnòstic en logopèdia, així com els procediments de la intervenció logopèdica.

Resultats d'aprenentatge

1. Analitzar i sintetitzar informació.
2. Argumentar la utilitat dels mètodes de mesura objectiva de la veu.
3. Comprendre, interpretar i expressar oralment i per escrit continguts propis de l'àmbit de la salut en una llengua estrangera.
4. Descriure les característiques de la veu normal i patològica.
5. Desenvolupar un pensament i un raonament crítics i saber comunicar-los de manera efectiva, tant en les llengües pròpies com en una tercera llengua.
6. Generar propostes innovadores i competitives en la recerca i en l'activitat professional.
7. Interpretar les dades aportades per les tècniques de mesura objectiva de la veu per emetre un diagnòstic.
8. Utilitzar les tècniques de mesura objectiva de la veu: enregistrament i anàlisi del so glotal, estroboscòpia, filtració inversa, electroglotografia, anàlisi laringoscòpica per cimografia profunda, transformació de Fourier, etc.

Continguts

- Voice evaluation
 - Perceptual (subjective) evaluation.
 - Acoustic (objective) analysis of voice
- Perceptual assessment
 - Basic perceptual parameters
 - Pitch
 - Loudness

Timbre: clearness, breathiness, roughness (harshness and hoarseness), asthenicity, strain, vocal efficiency and ring

Stability (in vocal attack, nucleus and coda)

The perception of original and processed samples

Perceptual scales

GRBASI

Perceptual training

- Acoustic analysis tools for voice evaluation

The narrow-band spectrogram to identify the source of instability

Fundamental frequency (pitch) stability

Intensity (loudness) stability

Resonance stability

Episodes with subharmonics

Phonation breaks

The frequency spectrum as a source of information on voice quality

Resonance and vocal efficiency: phonetic region, ring region

Timbre: asthenicity, strain, stridency; high frequency noise in breathiness; clearness vs loss of harmonicity (roughness -harshness and hoarseness); how does acoustic analysis solve cases that even a trained ear cannot

How does your voice change upon voice therapy or singing training exercises?

- An integrated perceptual-acoustic protocol for healthy and pathological voice evaluation. Hints for therapeutic / voice coaching / preventive intervention.

Metodologia

All sessions integrate theoretical and practical learning, there are no specific theory or practical classes.

The course is essentially practical, as it is aimed at conferring skills, a reasonable amount of experience, and self-confidence as a potential voice therapist.

The student will be the center of her/his own learning process. Understanding one's own voice as starting point to understand the users' voices.

Activitats formatives

Títol	Hores	ECTS	Resultats d'aprenentatge
Tipus: Dirigides			
Master classes, discussions and demos. All classes integrate theory and practice to	36	1,44	1, 2, 3, 4, 5, 6,

different degrees, there are no specific theory or practical classes.

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Tipus: Supervisades

Tutorials	4	0,16	1, 2, 3, 4, 5, 6
Writing assignment	25	1	1, 2, 3, 4, 5, 6, 8
Tipus: Autònomes			
Critical reading of articles, book chapters, online resources	25	1	1, 3, 5
Studying	50	2	1, 2, 3, 4, 5, 6, 8

Avaluació

EV1 - Mid-term, in-class, written test to assess the learning results achieved so far (week 9). Individual test.

EV2 - Mid-term in-class, oral test to assess the learning results achieved so far (week 13). Individual test.

EV3 - Final, in-class, oral report of the vocal evolution of a case under SLP intervention (week 18). Individual report

Definition of Passed Course: EV1,2,3 must each reach a grade equal or higher than 5 over 10.

Definition of Used-up Enrolment: Having handed-in evaluations amounting for 40% or more of the global grade, irrespectively of passing or failing.

Re-Test: Students with a global grade equal or higher than 4 over 10 have an option to be re-tested. In a tutorial with the professor/s the unsatisfactory learning results evidences will be identified, and the professor/s will propose the most suitable test for re-assessment during weeks 19-20.

Activitats d'avaluació

Títol	Pes	Hores	ECTS	Resultats d'aprenentatge
EV1 - Written test	30%	2	0,08	1, 2, 3, 4, 5, 7, 8
EV2 - Oral test	30%	2	0,08	1, 2, 3, 4, 5, 6, 7, 8
EV3 - Oral report	40%	6	0,24	1, 2, 3, 4, 5, 6, 7, 8

Bibliografia

- Principles of Voice Production. I. Titze (2000) Ed. National Center for Voice and Speech.
- Elements of Acoustic Phonetics. P. Ladefoged (1995). University of Chicago Press.
- The science of the singing voice. J. Sundberg (1987). Deklab, Northern Illinois University Press.
- Intervención logopédica en trastornos de la voz. Bustos, I. (2013). Barcelona. Paidotribo
- Patología de la voz. Cobeta, I., Núñez, F., i Fernández, S. (2013). Ponencia Oficial de la Sociedad Española de Otorrinolaringología y patología Cérvico-facial 2013

