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Senate Action Date: App-3/20/12

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

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Proposing Department/Unit <small>Speech-Language Pathology Program; Department of Special Education and Clinical Services</small>	Phone (724) 357-2450

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

New Course

Course Prefix Change

Course Deletion

Course Revision

Course Number and/or Title Change

Catalog Description Change

Current course prefix, number and full title: **SPLP 242, Speech Science 1**

Proposed course prefix, number and full title, if changing: **Speech Science I: Theory & Measurement**

2. Liberal Studies Course Designations, as appropriate

This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

Learning Skills Knowledge Area Global and Multicultural Awareness Writing Across the Curriculum (W Course)

Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

Global Citizenship

Information Literacy

Oral Communication

Quantitative Reasoning

Scientific Literacy

Technological Literacy

3. Other Designations, as appropriate

Honors College Course

Other: (e.g. Women's Studies, Pan African)

4. Program Proposals

Catalog Description Change

Program Revision

Program Title Change

New Track

New Degree Program

New Minor Program

Liberal Studies Requirement Changes

Other

Current program name: _____

Proposed program name, if changing: _____

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	<i>[Signature]</i>	12-5-11
Department Chairperson(s)	<i>[Signature]</i>	11/19/2011
College Curriculum Committee Chair	<i>Edel Reilly TECC Curr Chair</i>	2/27/12
College Dean	<i>A. Russo</i>	3/1/12
Director of Liberal Studies (as needed)		
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs	<i>Gail Schriest</i>	3/6/12

Received

MAR 2 2012

Liberal Studies

Course Revision

SPLP 242
Speech Science I: Theory & Measurement
(3c-0l-3cr)

1. Syllabus

Find attached the proposed course syllabus.

2. Summary of Changes

Changes are being made to the course title, the course catalog description, the course objectives, and course content. Specifically, swallowing instrumentation and measurement are being added to this course. This replaces previous content of hearing instrumentation and measurement which have been moved to SPLP 222, Introduction to Audiology. A prerequisite has been added that students must be SPLE majors to enroll.

3. Justification/Rationale for the Revision

Knowledge of clinical instrumentation and measurement of swallowing is essential to the practice of speech-language pathology. Previously, this information would only be provided at the graduate level. Establishing the basic science foundations of swallow assessment will allow for more advanced content discussions at the graduate level. A master's degree is the minimum degree requirement for certification as a speech-language pathologist. The technology presented in the course will reflect current practice trends. Previous course content on hearing instrumentation and measurement was redundant with information provided in SPLP 222 – Introduction to Audiology. Therefore, the elimination of this material from this course will not be detrimental. The prerequisite was added to ensure that only students who have been admitted to the major may enroll.

4. Old syllabus of record – Old syllabus of record is attached.

Syllabus of Record

I. Catalog Description:

SPLP 242 Speech Science I: Theory & Measurement

3 class hours
0 lab hours
3 credits

Prerequisites: SPLE Major

(3c-0l-3cr)
SpEd hours: 0
ELL hours: 0

Introduces students to the theoretic properties, biological characteristics, and physical analysis of human speech production, speech perception, and swallowing. Course content is integrated into applications of clinical instrumentation and measurement.

II. Course Outcomes:

- 1) Students will demonstrate knowledge of the physical theories and constructs of basic acoustics.
- 2) Students will demonstrate knowledge of the theories and physical principles of speech production and perception.
- 3) Students will analyze and interpret acoustic, aerodynamic, and endoscopic properties of phonation.
- 4) Students will interpret and analyze radiographic images of swallowing.
- 5) Students will demonstrate knowledge of the theories and physiology of the normal swallow.

The competencies in this course allow you to meet the following accreditation and certification standards:

Course Objective	College Conceptual Framework/Danielson	ASHA Standards	PDE Standards	Performance Indicator
1	1a	III-A, B	IC	Exam
2	1a	III-A, B,C	IC	Exam
3	1a	III-A, B,C	IH, L	Labs (spectrographic, spirometric, acoustic, aerodynamic, videoperceptual)
4	1f	III-A, B,C	IH, L	Lab (radiographic swallow studies)
5	1b	III-A, B,C	IC	Exam

III. Course Outline (42 hrs total)

Weeks 1-3 Readings: Behrman Cpts 3,7,8 (6 hrs)

Basic Acoustics (2 hrs)

Physics of Sound

Measurement of Sound

Source Filter Theory (2 hrs)

Biomechanics of phonation

Normal variants by age, gender

Formant Frequencies

Acoustic Phonetics (2 hrs)

Power Spectrum/Spectrography

Vowels vs Consonants

Normal variants by culture

Exam 1 (1 hr)

Weeks 4-6 Readings: Behrman Cpts 4,5,9,10 (7 hrs)

Respiration (3 hrs)

Respiratory Physiology

Spirometry

Pressures, Volumes & Capacities

Speech Breathing

Phonation (2 hrs)

Laryngeal Adjustments

Phonatory Principles

Bernoulli Principle

Aerodynamic Myoelastic theory

Body-Cover Theory

Measurement

Pressures & Airflow

Resonance/Articulation (2 hrs)

Cavities of the vocal tract

Sound qualities

Suprasegmentals & Distinctive features of speech production

Theoretic vs Phonemic concepts in speech

Exam 2 (1 hr)

Week 7-8 Readings: Behrman Cpt 7 (5 hrs)

Acoustic Analysis (3 hrs)

Intensity, Frequency, Perturbation

Nasalance

Laryngeal Imaging & Measurement (2 hrs)

Endoscopy, Stroboscopy, High Speed, Kymography, PGG, EGG, EMG

Exam 3 (1 hr)

Week 9 Readings: Behrman Cpt 7 (3 hrs)

Acoustic Analysis (3 hrs)

Normative data
Instrumentation
Analysis/Interpretation

Lab 1 (1 hr)

Week 10 Readings: Behrman Cpt 8 (3 hrs)

Aerodynamic Analysis (3 hrs)
Normative data
Instrumentation
Analysis/Interpretation

Lab 2 (1 hr)

Week 11 Readings: Behrman Cpt 7 (3 hrs)

Perceptual Analysis – Stroboscopy (3 hrs)
Vocal Fold Vibratory Characteristics
Instrumentation
Analysis/Interpretation

Lab 3 (1 hr)

Weeks 12-13 Rec Reading: Logemann Cpts 2,3 (5 hrs)

Swallowing (1 hrs)
Anatomy & Physiology Review
Videofluoroscopy (1 hrs)
Equipment
Radiation Safety
Imaging
Modified Barium Swallow (1 hrs)
Procedure
Timing Measures (1 hrs)
Transit times, Efficiency, Delays
Physiologic abnormalities as viewed radiographically (1 hr)
Residue vs Pooling
Swallow Response

Lab 4 (1 hr)

Week 14 (3 hrs)

Introduction to Endoscopic Evaluation of Swallowing (3 hrs)

Final Exam (2 hrs)

IV. Evaluation Methods

- 1) Three examinations in objective format (50% of final grade). Exams are worth 20%, 15%, 15% of the final grade.

- 2) Four In-Class Laboratory Exercises (35% of final grade). Acoustic & Aerodynamics labs are worth 12% of the final grade each. The Stroboscopy lab = 6%; Videofluoroscopy lab = 5%.
- 3) Final Examination is worth 15% of the final grade. It will be objective in format and address all of the swallowing content plus key content questions from earlier material.

V. Grading Scale

The final grade will be calculated by dividing the acquired points by the total possible points for a percentage. The following grade distribution will be used to assign final grades:

91-100%	=	A
82-90.9%	=	B
73-81.9%	=	C
66-72.9%	=	D
0-65.9%	=	F

Adaptations will be made to accommodate students with special needs, with appropriate documentation. Students with these concerns should confer with the instructor during office hours at the beginning of the semester to discuss accommodations needed. For further information, refer to the Undergraduate Course Catalog on support provided through the Disability Support Services in Pratt Hall (724-357-4067).

VI. Attendance Policy

Attendance in class is expected in accordance with the policy outlined in the university catalog.

VII. Required Textbook, Supplemental Books and Readings

Behrman, A. (2007). *Speech and Voice Science*. San Diego: Plural Publishing.

Recommended Readings:

Logemann, J.A. (1993). *Manual of the Videofluorographic Study of Swallowing (2nd ed)*. Austin: Pro-ed.

Baken, R.J. (2000). *Clinical Measurement of Speech and Voice*. Boston: Allyn & Bacon.

VIII. Special Resource Requirements:

Spectrography Shareware is recommended.

<http://www.visualizationsoftware.com/gram.html>

IX. Bibliography: (These are the most recent editions of these texts)

Baken, R.J. & Orlikoff, R.F. (1999). *Clinical Measurement of Speech and Voice (2nd ed.)*. San Diego: Singular Publishing.

Borden, G. & Harris, K., R. L. (2006). *Speech Science Primer: Physiology, Acoustics*

- and Perception of Speech (5th ed.)*. Lippincott Williams & Wilkins.
- Davies, A. & Moore, C. (2010). *The respiratory system*. (2nd ed.) Edinburgh: Elsevier Science.
- Ferrand, C., (2006). *Speech Science: An Integrated Approach to Theory and Clinical Practice (2nd ed)*. Boston: Allyn & Bacon.
- Hirano, M. (1981). *Clinical examination of voice*. New York: Springer-Verlag.
- Hixon, T.J., & Hoit, J.D. (2005). *Evaluation and management of speech breathing disorders: Principles and methods*. Tucson, AZ: Redington Brown.
- Logemann, J.A. (1993). *Manual of the Videofluorographic Study of Swallowing (2nd ed)*. Austin: Pro-Ed.
- Stemple, J., Glaze, L., Klaben, B. (2009). *Clinical Voice Pathology*. (2^{4th} ed.). Plural Publishing.
- Titze, I.R. (1980). Comments on the myoelastic-aerodynamic theory of phonation. *JSHR*, 23, 495-510.
- Titze, I.R. (2000). *Principles of voice production*. (2nd printing). Denver, CO: National Center for Voice and Speech.

COURSE SYLLABUS

CATALOG DESCRIPTION

SH 242 Speech Science I

3C-01-3sh

Prerequisites: SH 111 or EH 114 and SH 222 or Permission

Study of the communication process with emphasis on physical characteristics of sound production, transmission and perception of the sound, and the evolvment and use of symbols for meaningful communication. The scientific principles of normal oral communication are stressed, and language learning is recognized as a basis for oral communication.

COURSE OBJECTIVES

1. Students will understand acoustic and psychoacoustic principles associated with speech.
2. Students will be able to trace the speech event from acoustical generation through the physiological processes to perception.
3. Students will be able to provide a working knowledge of the latest theories and research procedures associated with the speech event, including cultural, sex, and age differences.

COURSE OUTLINE

	Time	%
A. Introduction to Speech Science	10	%
1. Perspectives		
2. The Speech Chain		
B. Expressive Linguistic Level	10	%
1. Symbolization		
2. Linguistic Organization		
3. Language		
C. Expressive Neurologic Level	15	%
1. Neuroanatomy of Speech and Language		
2. Nerves, Brain and the Speech Chain		
3. The Electrical Properties of Nerves		
4. The Schematic Diagram of the Nervous System		
D. Expressive Physiologic Level	15	%
1. Respiratory Function in Speech		
2. Phonation		

3. Normal Articulation Processes
 4. Speech Physiology
- E. Acoustic Level 15 %
1. The Physics of Sound
 2. Acoustics
 3. Speech Acoustics
- F. Receptive Physiologic Level 10 %
1. Elements of Auditory Physiology of the Outer and Middle Ear
- G. Receptive Neurologic Level 10 %
1. Nerves, Brain and the Speech Chain
 2. Elements of Auditory Physiology of the Inner Ear
- H. Receptive Linguistic Level 15 %
1. Hearing
 2. Speech Recognition
 3. Memory
 4. Automatic Learning
 5. Higher Learning
 6. Computers and the Brain
 7. A Look Toward the Future

EVALUATION METHODS

Three (3) examinations will be given with each exam composed of fifty (50) objective questions containing five (5) answer foils. Each exam will be graded by converting the percent correct score to a Percentile Rank. Averaging the Percentile Rank scores at the end of the semester will be the basis of the final letter grade. The following Percentile Ranks represent the ranges for all letter grades:

86 - 100	PR	A
56 - 85	PR	B
11 - 55	PR	C
3 - 10	PR	D
0 - 2	PR	F

REQUIRED TEXTBOOK, SUPPLEMENTAL BOOKS AND READINGS

Textbook: Perkins, W. (1985). Functional Anatomy of Speech, Language and Hearing. Austin, TX: Pro-Ed.

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