

COURSE TITLE: BASIC SCIENCES OF AUDIOLOGY

Study Hours: 60+160

Paper: 1

Term: 3rd

Marks
Theory: 120

Practical: 30
Time: 3Hrs

COURSE CONTENTS

(THEORY +PRACTICAL)

A) PHYSICAL ACOUSTICS: PART 1:

Definitions of Terms:

A1 Acoustics

A2 Audiometry

A3 Audiology

A4 The Nature Of Sound,

A5 Simple Harmonic Motion (SHM)

A6 Waves, Frequency, Period, Amplitude

A7 Types of Sounds

A8 Beats

B.PHYSICAL ACOUSTICS PART 2:

B1 Introduction to Units in SI systems

B2 Useful Equations

B3 The decibelscale, dBA, dBSPL, dBHL

B4 Speed of Sound

B5 Intensity of Sound

B6 Near and Far Fields

B7 Impedance

B8 Resonance

B9 Damping

B10 Standing waves,

B11 The lowest resonant frequency of ear canal,

B12 Helmholtz Resonator, Noise and its types,

C.ACOUSTICS AND SOUND MEASUREMENT ACOUSTICS PRINCIPLES AND APPLICATIONS:

C1 Nature Of Sound,

C2 Pure and Complex Tones, Beats

C3 Impulse, Sounds, Transient Sounds, Sound Pressure, Sound Intensity,

C4 Decibel Scales, Frequency,

C5 Speed of Sound, Wavelength,

C6 Line and Continuous Spectra,

C7 Harmonic and Intermodulation Distortion

C8 Progressive (Travelling) And Standing Waves, Phase

C9 Resonance, Harmonics, Reflection, Refraction Diffraction, Echopes,
C10 Room Acoustics
C11 Sound Reflection
C12 Sound Absorption
C13 Acoustic Insulation
C14 Reverberation
C15 Design Requirements for an Audiology Department.

D.PRINCIPLES OF ADMITTANCE/IMPEDANCE

D1 Principles of Acoustic Impedance and Admittance
D2 Effect of Frequency on Acoustic Impedance and Admittance.

E.MEASUREMENT OF SOUND PRESSURE:

E1 Sound Level Meter,
E2 simulators of human head

F.PSYCHO-ACOUSTICS:

F1 Hearing Sensitivity
F2 Threshold
F3 The Audiogram
F4 Minimum audible pressure (MAP)
F5 Minimum Audible field (MAF)
F6 Loudness and Intensity
F7 pitch and frequency
F8 Timbre
F9 Masking Upward Spread of masking
F10 Critical Bands
F11 Adding loudness
F12 Temporal Resolution
F13 Forward and Backward Masking
F14 Temporal Integration
F15 Adaptation and Fatigue
F16 Binaural hearing
F17 Sound Localization
F18 Theories of Hearing

RECOMMENDED BOOKS

1. Textbook of Ear, Nose and Throat Diseases 12th Edition by [MohammadMaqbool](#) (Editor), [SuhailMaqbool](#) (Editor), [Suresh C. Sharma](#) (Foreword)
2. Ear, Nose and Throat Diseases P.L Dhingra 7th Edition.
3. Pediatric Audiology(0-5 Years) By BarreyMcCormick, PhD.
4. Educational Audiology By Ivan Tucker and Michael Nolan.
5. Principles of Hearing Aid Audioogy By Maryanne Tate.
6. Handbook of Clinical Audiology, Fifth Edition. Jack Katz, editor. (April 26, 2002)
7. Hearing Aids. Harvey Dillon. (May 3, 2002)
8. Introduction to Audiology, Eighth Edition. Frederick N. Martin and John Greer Clark. (November 19, 2003)

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1. Foundations of Pediatric Audiology. Fred H. Bess and Judith S. Gravel (May 13, 2008). Reviewed by Jane B. Seaton, M.S., Audiology and Communication Disorders Consultant, Seaton Consultants, Athens, GA.
2. Fundamentals of Hearing: An Introduction, 5th Edition. William A. Yost (April 21, 2008). Reviewed by Jerry L. Northern, PhD, Professor Emeritus, University of Colorado School of Medicine Department of Otolaryngology (Audiology), Denver, CO.
3. Hearing: Anatomy, Physiology, and Disorders of the Auditory System. Aage R. Moller (December 20, 2006).
4. Hearing Instrument Technology for the Hearing Health Care Professional. Andi Vonlanthen and Horst Arndt. (September 29, 2006).
5. Acoustics for Audiologists. Peter Haughton. (January 9, 2003)
6. Better Communication and Hearing Aids: A Guide to Hearing Aid Use. Donna S. Wayner and Judy E. Abrahamson. (January 30, 2003)
7. Color Atlas of Otoscopy: From Diagnosis to Surgery. Sanna, M., Russo, A., DeDonato, G., Caruso, A., and Taibah, A. (May 16, 2003)
8. Counseling Children With Hearing Loss and Their Families. Kristina M. English. (April 26, 2002).
9. Fundamentals of Sound with Applications to Speech and Hearing. William J. Mullin, William J. Gerace, Jose P. Mestre, and Shelley L. Velleman (March 3, 2004)
10. Otoacoustic Emissions: Clinical Applications, Second Edition. Martin S. Robinette and Theodore J. Glatke, editors. (April 26, 2002)

COURSE TITLE: MEDICAL ASPECTS OF AUDIOLOGY

Study Hours: 60+160

Paper : 2

Term : 3rd

Marks

Theory: 120

Practical: 30

Time: 3Hrs

COURSE CONTENTS

(THEORY +PRACTICAL)

ANATOMY AND PHYSIOLOGY OF THE AUDITORY SYSTEM:

A brief description of the human ear including the study of the followings:

A) ANATOMY

A1 External Ear

A2 Tympanic membrane

A3 Middle Ear. Middle Ear Muscles, Ossicles, Eustachian Tube, Mastoid Cavity

A4 Inner Ear

A5 Eight (8th) Cranial Nerve (Auditory Nerve), Afferent and Efferent Pathway

A6 Auditory cortex

A7 Vestibular Labyrinth, Utricle, Saccule, Semicircular Canals

A8 Vestibular Nerve, Facial nerve

B) PHYSIOLOGY:

B1 Acoustic properties of the head.

B2 Pinna, External Ear, Auditory meatus, Tympanic Membrane.

B3 Middle Ear, Ossicular Chain, Reflexes of the Middle Ear Muscles.

B4 Transformer function of middle Ear.

B5 Hearing by Air and Bone conduction.

B6 Hydro-Mechanical properties of the Basilar Membrane and organ of corti

B7 Action potential, cochlear microphonic, summing potential, otoacoustic emissions

B8 Cochlea, Otolith

B9 Equilibrium, Cerebellar Cortex

C.ANATOMY AND PHYSIOLOGY OF VESTIBULAR PATHWAY:

C1 Proprioceptive, Vestibular and Visual Input

C2 Vestibule-Ocular Vestibule-Spinal Reflexes.

D.MEDICAL ASPECTS OF AUDIOLOGY:

Types and Effects of Hearing Impairment:

D1 Conductive Impairments

D2 Sensory Impairments

D3 Peripheral Impairments

D4 Neural Impairments

D5 Central Impairments

D6 Mixed Impairments

D7 Non –organic Hearing loss

D8 Degree of Hearing Loss

E.PATHOPHYSIOLOGY

- E1 Disorder of the external Auditory Meatus
- E2 Diseases of Middle Ear, Inner Ear, and 8th Nerve
- E3 Otitis Externa
- E5 Otitis Media with effusion,
- E6 Acute Otitis Media
- E7 Chronic Suppurative Otitis Media,
- E8 Cholesteatoma,
- E9 Perforations,
- E10 Otosclerosis,
- E11 Ossicular Discontinuity and fixation ,
- E12 Menier's Disorder,
- E13 Pressbycusis,
- E14 Noise-induced Hearing Loss
- E15 Acoustic Trauma
- E16 Ototoxicity
- E17 Infection of outer, Middle and Inner Ear,
- E18 Acoustic Neuroma, Central Disorders,
- E19 Congenital and Acquired Hearing Impairment,
- E20 Prevalence, inherited syndrome's, pre-,post-,post-natal factors ,
- E21 Disorders affecting balance. Nystagmus, Tinnitus,Hyperacusis.
- E22 Metabolic Disorders
- E23 Immunological Disorder Affecting Hearing system

F) OTOSCOPY:

- F1 Use of otoscope,
- F2 Normal and abnormal appearance of tympanic Membrane,
- F3 safe Handling ,
- F4 Hygiene

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