UNIVERSITY OF THE PUNJAB

NOTIFICATION

It is hereby notified that the Syndicate at its meeting held on 28-03-2025 has approved the recommendations of the Academic Council made at its meetings dated 27-01-2025 regarding Curriculum/Schemes of Studies/Syllabi/Courses of Reading of following Programs prepared in the light of HEC's Undergraduate Education Policy, 2023 w.e.f. Session, 2025 to be offered at the Department of Allied Health Sciences:-

i. BS in Medical Laboratory Technology (4-years Program)
ii. BS in Audiology (4-years Program)
iii. BS in Optometry & Vision Sciences (4-years Program)
iv. Doctor of Physiotherapy (5-years Program)

The Syllabi and Scheme of Studies of above Programs are enclosed herewith as Annexure-'A'.

Sd/-
Registrar

Admin. Block,
Quaid-i-Azam Campus,
Lahore.
No. D/3707 /Acad. **Dated: 14-5- /2025.**

Copy of the above is forwarded to the following for information and necessary action:-

1. Dean, Faculty of Health Sciences
2. Chairman, Department of Allied Health Sciences.
3. Controller of Examinations
4. Director, IT for placement at website
5. Secretary to the Vice-Chancellor
6. Private Secretary to the Registrar
7. Assistant Registrar (Statutes)
8. Admin. Officer (Syllabus)

14/5/25

Assistant Registrar (Academic)
for Registrar

Program Curriculum

(B.S. Audiology)

Department of Allied Health Sciences,
University of the Punjab
Lahore

Programme	BS Audiology				
Duration	04 Years	**Semesters**	**08**	**Credit hours**	**141(105+36)**
Department	**Department of Allied Health Sciences**				
Faculty	**Faculty of Health Sciences**				

Department Introduction

The Department of Allied Health Sciences was established in 2017 under the umbrella of the Faculty of Health Sciences at the University of the Punjab. The department is dedicated to advancing healthcare through education, research, and the preparation of skilled professionals in various allied health disciplines and aims to provide a comprehensive educational experience that combines classroom learning, laboratory work, and hands-on clinical practice in a variety of settings. Our degree programs are designed to provide students with a strong foundation in healthcare, preparing them for impactful careers in the ever-evolving medical field. Students engage in supervised clinical placements, internships, and research opportunities, which prepare them for professional practice upon graduation. Additionally, our programs encourage critical thinking, lifelong learning, and ethical practice, empowering graduates to deliver high-quality care to individuals across the lifespan—from pediatric to geriatric populations.

With a focus on academic excellence and patient-centered care, the Department of Allied Health Sciences is committed to producing compassionate and skilled professionals who are prepared to meet the growing demands of hearing healthcare in diverse clinical environments.

Department Vision

We envision a future where our graduates are recognized for their innovation, leadership, and ability to provide compassionate, evidence-based care. By fostering interdisciplinary collaboration, advancing research, and staying at the forefront of technological advancements in Allied Health, we strive to make a significant impact on the health and well-being of individuals worldwide.

Our department will continue to evolve as a hub for excellence in education and clinical practice, cultivating a community of learners, practitioners, and researchers who are dedicated to enhancing the lives of those with health challenges.

Department Mission

Our mission is to develop highly skilled, compassionate, and ethical health-care professionals who are equipped with knowledge and clinical expertise to assess, diagnose, and manage various health related issues. We strive to foster an environment of academic excellence, where students are encouraged to engage in evidence-based practice, critical thinking, and lifelong learning.

Through a comprehensive curriculum that combines theoretical instruction with hands-on clinical experience, we aim to prepare our graduates to meet the diverse and evolving needs of individuals with health issues. Our mission is also to promote patient-centered care, emphasizing the importance of effective communication, empathy, and advocacy for individuals with various health challenges. We are committed to creating a learning environment that fosters innovation, integrity, and leadership in the field of health sciences.

Department Goals

1. **Provide High-Quality Education**: Equip students with the knowledge, skills, and practical experience needed to excel in allied health professions.
2. **Promote Research and Innovation**: Advance research that contributes to healthcare improvements and the development of new practices, technologies, and treatment modalities.

3. **Enhance Professional Development**: Support continuous learning and professional growth for students and faculty through certifications, workshops, and seminars.
4. **Improve Patient Care and Outcomes**: Prepare students to collaborate effectively in interdisciplinary teams to enhance healthcare delivery and patient outcomes.
5. **Foster Community Engagement**: Build partnerships with local and global healthcare organizations to provide services, education, and outreach to diverse and underserved communities.

Program Introduction

The **Bachelor of Science in Audiology (B.S. in Audiology)** program at University of the Punjab, Lahore offers a comprehensive education in the diagnosis, treatment, and management of hearing and balance disorders. This four-year program combines academic learning with hands-on clinical experience, preparing students to become skilled audiologists.

Students will study the anatomy and physiology of the auditory and vestibular systems, advanced audiometric testing, hearing aids, and auditory rehabilitation. Emphasis is placed on patient-centered care, professional communication, and interdisciplinary collaboration. Through clinical internships and research opportunities, students gain real-world experience in assessing and treating hearing impairments across diverse populations.

Graduates are equipped to work in hospitals, private clinics, schools, and public health settings, or pursue advanced studies. The program provides a strong foundation for those passionate about improving lives through better hearing and communication.

Program Objectives

Upon completion of the **B.S. in Audiology** program, graduates will be able to:

1. **Demonstrate Proficiency in Audiological Assessment**: Conduct comprehensive audiometric tests, including pure-tone audiometry, speech audiometry, and electrophysiological assessments, to diagnose hearing and balance disorders.
2. **Apply Knowledge of Auditory and Vestibular Systems**: Understand the anatomy, physiology, and pathophysiology of the auditory and vestibular systems to assess and manage related disorders effectively.
3. **Implement Audiological Rehabilitation**: Develop and execute rehabilitation plans, including the fitting and management of hearing aids, cochlear implants, and assistive listening devices, to improve patient outcomes.
4. **Promote Patient-Centered Care**: Communicate effectively with patients, families, and healthcare teams, demonstrating ethical practices and empathy in providing audiology services.
5. **Engage in Evidence-Based Practice**: Use research and data to inform clinical decisions and contribute to the advancement of the audiology field through research and continuous learning.

Market Need / Rationale of the Program

The demand for audiologists is growing both nationally and internationally, driven by factors such as an aging population, increasing awareness of hearing health, and advancements in hearing technology. As hearing loss becomes a more prominent health issue worldwide, there is a pressing need to develop a skilled workforce of audiologists capable of addressing the diverse needs of patients across various age groups. The introduction of the **Bachelor of Science in Audiology (B.S. in Audiology)** program will directly address this need and provide a strong foundation for students pursuing careers in this vital healthcare field.

Admission Eligibility Criteria

- 12 Years of Study completed

- Study Program/Subject F.Sc. Pre Medical or Equivalent
- Percentage > 60%
- Entry Test

Categorization of Courses as per HEC Recommendation and Difference

Semester	Courses	Category (Credit Hours)					
		Core Courses (Compulsory)	Basic Courses (General/Foundation)	Major Electives	Minor Electives (interdisciplinary)	Any Other	Semester Load
1	7	-	4(10)	-	2(6)	-	**16 (13+3)**
2	8	1	4(9)	2(6)	1(3)	-	**19(17+2)**
3	7	-	3(9)	2(6)	1(2)	-	**17(14+3)**
4	8	1	2(4)	5(15)	-	-	**20(18+2)**
5	7	-	-	4(12)	2(6)	-	**18(14+4)**
6	7	1		5(15)	1(3)	-	**19(14+5)**
7	7	3		5(14)	-	-	**17(9+8)**
8	6	4		3(9)	1(2)	-	**15(6+9)**
PU	**57**	**10**	**32**	**77**	**23**		**141(105+36)**
HEC Guidelines		**6**	**32**	**≥72**	**≥12**		
Difference (HEC &) PU		**4**	**0**	**5**	**11**		

**Core: Compulsory, Basic: Foundation, Major Electives: Professional Minor Electives: Specialization*
Note: The course/column heads are customizable according to nature and level of the program.

Scheme of Studies

S. #.	Course Code	Title of the Course	Credit Hours
1.	GENG-101	Functional English	3(3+0)
2.	GISL-101 / GETH-101	Islamic Studies / Ethics (for Non-Muslims)	2(2+0)
3.	GICP-101	Ideology & Constitution of Pakistan	2(2+0)
4.	AUD-101	Biochemistry	3(2+1)
5.	AUD-102	Anatomy	3(2+1)
6.	AUD-103	Physiology	3(2+1)
7.	HQ-001	Tarjuma-e-Quran	0
8.	GQR-101	Quantitative Reasoning-I	3(3+0)
9.	AUD-104	Introduction to Sustainable Developmental Goals	3(3+0)
10.	AUD-105	Behavioral Sciences	2(2+0)
11.	AUD-106	Medical Sociology	2(2+0)
12.	AUD-107	Pakistan Studies	2(2+0)
13.	AUD-108	Audiological Assessment and Disorders	3(2+1)
14.	AUD-109	Audiological Theory & Practice	3(2+1)
15.	HQ-002	Tarjuma-e-Quran	1
16.	GQR-202	Quantitative Reasoning-II	3(3+0)
17.	GENG-201	Expository Writing	3(3+0)
18.	GICT-201	Applications of ICT	3(2+1)
19.	AUD-201	Medical Ethics	2(2+0)
20.	AUD-202	Basic Pathology	3(2+1)
21.	AUD-203	Acoustics, Psychoacoustics, Auditory Perception	3(2+1)
22.	HQ-003	Tarjuma-e-Quran	0
23.	GENT-101	Entrepreneurship	2(2+0)
24.	GCCE-101	Civics and Community Engagement	2(2+0)
25.	AUD-206	Development Pediatrics	3(3+0)
26.	AUD-207	Amplification Devices	3(2+I)
27.	AUD-208	Pharmacology in Audiology	3(3+0)
28.	AUD-209	Advance Audiology	3(2+1)
29.	AUD-210	Medical Audiology 1	3(3+0)
30.	HQ-004	Tarjuma-e-Quran	1
31.	AUD-301	Biosafety-Patient and Equipment Safety	3(3+0)
32.	AUD-302	Balance Assessment - 1	3(2+1)
33.	AUD-303	Medical Audiology II	3(3+0)
34.	AUD-304	Neuro anatomy and Embryology	3(3+0)
35.	AUD-305	Basic Electronics	3(2+1)
36.	AUD-306	Audiology Practice	3(1+2)
37.	HQ-005	Tarjuma-e-Quran	0
38.	AUD-307	Audiological Practice	3(2+1)
39.	AUD-308	Pediatric Audiology	3(2+1)
40.	AUD-309	Geriatric Audiology	3(2+1)
41.	AUD-310	Diagnostic Audiology I	3(2+1)
42.	AUD-311	Medical Imaging Studies for Audiologists	3(2+1)
43.	AUD-312	Balance Assessment – II	3(2+1)
44.	HQ-006	Tarjuma e Quran	1
45.	AUD-401	Hearing Aids	3(2+1)
46.	AUD-402	Diagnostic Audiology II	3(2+1)
47.	AUD-403	Advance Clinical Audiology	2(0+2)

48.	AUD-404	Advance Audiological Rehabilitation	3(3+0)
49.	AUD-405	Synopsis Writing	3(2+1)
50.	AUD-406	Field Experience/Internship	3(0+3)
51.	HQ-007	Tarjuma e Quran	0
52.	AUD-407	Implantable Devices	3(2+1)
53.	AUD-408	Seminar: updates and current Development	3(0+3)
54.	AUD-410	Introduction to Artificial Intelligence in Audiology	3(2+1)
55.	AUD-411	Capstone Project	3(0+3)
56.	AUD-412	Research Methodology & Skill Enhancement	2 (2+0)
57.	HQ-008	Tarjuma e Quran	1
Total Credit Hours			**141(105+36)**

Scheme of Studies / Semester-wise workload

#	Code	Course Title	Course Type	Prerequisite	Credit hours	Total
Semester I						
1.	GENG-101	Functional English	General		3(3+0)	
2.	GISL-101 / GETH-101	Islamic Studies / Ethics (for Non-Muslims)	General		2(2+0)	
3.	GICP-101	Ideology & Constitution of Pakistan	General		2(2+0)	
4.	AUD-101	Biochemistry	General (Nat. Sci.)		3(2+1)	
5.	AUD-102	Anatomy	Interdisciplinary		3(2+1)	
6.	AUD-103	Physiology	Interdisciplinary		3(2+1)	
7.	HQ-001	Tarjuma-e-Quran	Compulsory		0	
Total Credit Hours						**16(13+3)**
Semester II						
1.	GQR-101	Quantitative Reasoning-I	General		3(3+0)	
2.	AUD-104	Introduction to Sustainable Developmental Goals	Interdisciplinary		3(3+0)	
3.	AUD-105	Behavioral Sciences	General		2(2+0)	Art & Hum
4.	AUD-106	Medical Sociology	General		2(2+0)	Social Sci
5.	AUD-107	Pakistan Studies	General		2(2+0)	General
6.	AUD-108	Audiological Assessment and Disorders	Major		3(2+1)	
7.	AUD-109	Audiological Theory & Practice	Major		3(2+1)	
8.	HQ-002	Tarjuma-e-Quran	Compulsory		1	
Total Credit Hours						**19(17+2)**
Semester III						
1.	GQR-202	Quantitative Reasoning-II	General		3(3+0)	
2.	GENG-201	Expository Writing	General		3(3+0)	
3.	GICT-201	Applications of ICT	General		3(2+1)	
4.	AUD-201	Medical Ethics	Interdisciplinary		2(2+0)	
5.	AUD-202	Basic Pathology	Major		3(2+1)	
6.	AUD-203	Acoustics, Psychoacoustics, Auditory Perception	Major		3(2+1)	
7.	HQ-003	Tarjuma-e-Quran	Compulsory		0	
Total Credit Hours						**17(14+3)**
Semester IV						
1.	GENT-101	Entrepreneurship	General		2(2+0)	
2	GCCE-101	Civics and Community Engagement	General		2(2+0)	
3.	AUD-206	Development Pediatrics	Major		3(3+0)	

#	Code	Course Title	Course Type	Prerequisite	Credit hours	Total
4.	AUD-207	Amplification Devices	Major		3(2+I)	
5.	AUD-208	Pharmacology in Audiology	Major		3(3+0)	
6.	AUD-209	Advance Audiology	Major		3(2+1)	
7.	AUD-210	Medical Audiology 1	Major		3(3+0)	
8.	HQ-004	Tarjuma-e-Quran	Compulsory		1	
Total Credit Hours						**20(18+2)**
Semester V						
1.	AUD-301	Biosafety-Patient and Equipment Safety	Major		3(3+0)	
2.	AUD-302	Balance Assessment - 1	Major		3(2+1)	
3.	AUD-303	Medical Audiology II	Major		3(3+0)	
4.	AUD-304	Neuro anatomy and Embryology	Interdisciplinary		3(3+0)	
5.	AUD-305	Basic Electronics	Interdisciplinary		3(2+1)	
6.	AUD-306	Audiology Practice	Major		3(1+2)	
7.	HQ-005	Tarjuma-e-Quran	Compulsory		0	
Total Credit Hours						**18(14+4)**
Semester VI						
1.	AUD-307	Audiological Practice	Major		3(2+1)	
2.	AUD-308	Pediatric Audiology	Major		3(2+1)	
3.	AUD-309	Geriatric Audiology	Major		3(2+1)	
4.	AUD-310	Diagnostic Audiology I	Major		3(2+1)	
5.	AUD-311	Medical Imaging Studies for Audiologists	Interdisciplinary		3(2+1)	
6.	AUD-312	Balance Assessment – II	Major		3(2+1)	
7.	HQ-006	Tarjuma e Quran	Compulsory		1	
Total Credit Hours						**19(14+5)**
Semester VII						
1.	AUD-401	Hearing Aids	Major		3(2+1)	
2.	AUD-402	Diagnostic Audiology II	Major		3(2+1)	
3.	AUD-403	Advance Clinical Audiology	Major		2(0+2)	
4.	AUD-404	Advance Audiological Rehabilitation	Major		3(3+0)	
5.	AUD-405	Synopsis Writing	Major		3(2+1)	
6.	AUD-406	Field Experience/Internship	Compulsory		3(0+3)	
7.	HQ-007	Tarjuma e Quran	Compulsory		0	
Total Credit Hours						**17(9+8)**
Semester VIII						

#	Code	Course Title	Course Type	Prerequisite	Credit hours	Total
1.	AUD-407	Implantable Devices	Major		3(2+1)	
2.	AUD-408	Seminar: updates and current Development	Major		3(0+3)	
3.	AUD-410	Introduction to Artificial Intelligence in Audiology	Interdisciplinary		3(2+1)	
4.	AUD-411	Capstone Project	Compulsory	Capstone	3(0+3)	
5.	AUD-412	Research Methodology & Skill Enhancement	Major		2 (2+0)	
6.	HQ-008	Tarjuma e Quran	Compulsory		1	
Total Credit Hours						**15(6+9)**
Total						

Types of course may be core (compulsory), basic (foundation), major elective (professional), minor elective (specialization) etc.

Research Thesis / Project /Internship					
Details (credit hours, semesters etc.) • Internship (3 Credit Hours) in 7th Semester • Capstone Project (3 Credit Hours) in Final Semester					
Award of Degree					
Degree awarding criteria stating: As per PU undergraduate policy Thesis /Project/Internship (Compulsory) Any other requirement, e.g. Comprehensive examination (if applicable)					
NOC from Professional Councils (if applicable)					
The required NOC will be processed accordingly.					
Faculty Strength					
Degree		**Area/Specialization**		**Total**	
PhD		1. Human Genetics 2. Molecular Biology 3. Biochemistry 4. Molecular Biology and Molecular Genetics		**5**	
MPhil		1. Molecular Biology		**1**	
Total				**6**	
Present Student Teacher Ratio in the Department					
Total Faculty	**6**	**Total Students**	**NA**	**Ratio**	**NA**
Initially Startup of the Program.					
Course Outlines separately for each course					

Department of Allied Health Sciences
Faculty of Health Sciences
University of the Punjab, Lahore
Course Outline

Programme	Audiology	**Course Code**	**AUD-101**	**Credit Hours**	3(2+1)
Course Title	Biochemistry				

Course Introduction

Biochemistry is the study of the chemical substances and processes that occur in living organisms. It focuses on the structure, function, and role of biomolecules like proteins, carbohydrates, lipids, nucleic acids, and enzymes. Biochemists investigate the chemical reactions that drive biological functions, including the synthesis of biologically active molecules. The field also examines the structure and metabolism of essential compounds, helping to understand how these molecules contribute to life processes. Biochemistry applies physicochemical principles to study macromolecules within living systems, covering topics such as metabolic pathways, enzyme kinetics, and energy production. This discipline plays a key role in medicine, pharmacology, and nutrition, contributing to the development of new therapies, diagnostics, and dietary guidelines. By linking chemistry and biology, biochemistry provides insights into the molecular basis of life and its impact on health and disease.

Learning Outcomes

On the completion of the course, the students will:

- Understand the chemical substances and biochemical processes in living organisms.
- Describe the structure, function, and role of key biomolecules like proteins, carbohydrates, lipids, and nucleic acids.
- Apply physicochemical principles to study metabolic pathways and biological processes.
- Identify key metabolic pathways and explain their role in energy production.
- Explain enzyme function, kinetics, and regulation in biochemical reactions.
- Demonstrate proficiency in laboratory techniques for analyzing biomolecules.
- Understand molecular mechanisms of diseases and apply biochemistry in diagnosis and treatment.
- Understand the synthesis and breakdown of biologically active molecules.
- Apply biochemistry to nutrition, pharmacology, and clinical diagnostics in allied health sciences.
- Develop analytical and problem-solving skills for interpreting experimental data and real-world health scenarios.

Course Content (Theory)		**Assignments/Readings**
Week 1	Introduction to Biochemistry	Biochemistry Textbook
	pH and pH Scale (Acidity & Alkalinity); Acid-Base Regulation in the Body	Complete exercises on pH scale and buffers
Week 2	Body Buffers and Their Mechanism of Action	Read on body buffers, focus on bicarbonate buffer
	Biochemical Composition and Functions of the Cell; Movement of Materials Across the Cell	Read Chapter on Cellular Structures and Transport
Week 3	Carbohydrates: Biochemical Structure, Function, and Classification (Polysaccharides, Oligosaccharides, Monosaccharides)	Review carbohydrate structures
	Carbohydrate Digestion and Absorption	Solve carbohydrate digestion problems
Week 4	Glycolysis: Introduction, Transport of Glucose into the Cell	Read about glycolysis and glucose transport

	Glycolysis Reactions: Reduction of Pyruvate to Lactate; Energy Yield from Glycolysis	Complete glycolysis pathway exercises
Week 5	Regulation of Glycolysis	Study regulation mechanisms of glycolysis
	Alternate Fates of Pyruvate	Review metabolism of pyruvate and its fates
Week 6	Tricarboxylic Acid Cycle: Reactions of the TCA Cycle	Read about the TCA cycle
	Mechanism of Arsenic Poisoning; Energy Produced by the TCA Cycle	Solve questions on arsenic poisoning and TCA
Week 7	Regulation of the TCA Cycle	Review TCA cycle regulation factors
	Substrates for Gluconeogenesis, Reactions Unique to Gluconeogenesis	Read about gluconeogenesis
Week 8	Regulation of Gluconeogenesis; Glycogen Metabolism	Study glycogen metabolism pathways
	Glycogenesis, Glycogenolysis	Complete exercises on glycogenesis and glycogenolysis
Week 9	Regulation of Glycogenesis and Glycogenolysis	Review the role of hormones in glycogen metabolism
	Irreversible Oxidative Reactions, Reversible Non-Oxidative Reactions	Read about oxidative and non-oxidative reactions
Week 10	Uses of NADPH	Study NADPH functions and its role in metabolism
	Diseases Associated with Carbohydrate Metabolism	Research diseases like diabetes, glycogen storage disorders
Week 11	Amino Acids: Introduction, Structure, Function, and Classification	Review amino acid structures and classification
	Primary Structure of Proteins: Peptide Bond and Folding	Complete protein structure exercises
Week 12	Secondary Structure of Proteins: α-Helices and β-Sheets	Study protein secondary structure in detail
	Tertiary and Quaternary Structure of Proteins; Protein Misfolding	Read on protein folding and misfolding
Week 13	Globular Proteins	Solve exercises on globular proteins
	Globular Hemoproteins: Myoglobin and Hemoglobin	Study hemoglobin and myoglobin structure
Week 14	Structure and Function of Myoglobin, Hemoglobin; Binding of Oxygen to Myoglobin and Hemoglobin	Research oxygen binding kinetics
	Allosteric Effects; Bohr Effect	Review allosteric regulation and the Bohr effect
Week 15	Fibrous Proteins: Collagen and Elastin	Study structure and function of collagen and elastin
	Protein Digestion and Absorption	Solve problems on protein digestion
Week 16	Urea Cycle and Metabolism of Ammonia	Complete urea cycle pathway exercises
	Enzymes: Introduction, Nomenclature, and Properties of Enzymes	Study enzyme classification and properties
Course Content (Lab)		**Assignments/Readings**
Week 1	pH Determination of Different Solutions	Read Chapter on pH and Buffer Systems from the textbook.

Week 2	Qualitative Determination of Carbohydrates	Read about Carbohydrate Classification and Tests.
Week 3	Molisch's Test for Carbohydrates	Study the Molisch's Test mechanism and its role in identifying carbohydrates.
Week 4	Iodine Test for Starch	Review Iodine Test mechanism and its use for detecting polysaccharides.
Week 5	Benedict's Test for Reducing Sugars	Read about reducing sugars and their reaction with Benedict's reagent.
Week 6	Barfoed's Test for Monosaccharides	Study Barfoed's test for distinguishing monosaccharides from disaccharides.
Week 7	Seliwanoff's Test for Aldoses vs. Ketoses	Review Seliwanoff's reagent reaction with aldoses and ketoses.
Week 8	Osazone Test for Carbohydrates	Study Osazone formation and its role in identifying sugars.
Week 9	Qualitative Determination of Proteins	Study protein structure and tests for protein presence.
Week 10	Ninhydrin Test for Amino Acids and Proteins	Read about the Ninhydrin test for amino acids and proteins.
Week 11	Biuret Test for Proteins	Study the Biuret reagent and its application to peptide bonds.
Week 12	Heavy Metal Test for Proteins	Study the reactions of proteins with heavy metals and their significance.
Week 13	Heat Coagulation Test for Proteins	Review protein denaturation and coagulation upon heating.
Week 14	Helle's Test for Protein Detection	Study the Helle's test for protein detection in biological fluids.
Week 15	Saturation Test for Lipids and Proteins	Read about saturation and its application in biochemical assays.
Week 16	Quantitative Determination of Glucose in Blood by Glucose-Oxidase Method Quantitative Determination of Protein by Biuret Method	Review glucose metabolism and the glucose-oxidase method. Study the Biuret method and protein quantification protocols.

Textbooks and Reading Material

- **Nelson, D. L., & Cox, M. M. (2024).** *Lehninger Principles of Biochemistry* (9th ed.). W.H. Freeman & Company.
- **Berg, J. M., Tymoczko, J. L., &Stryer, L. (2024).** *Biochemistry* (9th ed.). W.H. Freeman & Company.
- **Murray, R. K., Granner, D. K., Mayes, P. A., &Rodwell, V. W. (2024).** *Harper's Illustrated Biochemistry* (35th ed.). McGraw-Hill Education.
- Abali, E. E., Cline, S. D., Franklin, D. S., &Viselli, S. M. (2021). *Lippincott Illustrated Reviews: Biochemistry.* Lippincott Williams & Wilkins.
- Voet, D., Voet, J. G., & Pratt, C. W. (2018). *Voet's Principles of Biochemistry.* Wiley Global Education.
- Karp, G., Iwasa, J., & Marshall, W. (2018). *Karp's Cell Biology.* John Wiley & Sons.
- Berg, J. M., Tymoczko, J. L., Stryer, L. (2024). Biochemistry: Laboratory Manual (9th ed.). W.H. Freeman & Company.
- Devlin, T. M. (2024). Biochemistry Laboratory Manual (12th ed.). Elsevier.
- Nelson, D. L., Cox, M. M. (2024). Lehninger Principles of Biochemistry: Laboratory Manual (9th ed.). W.H. Freeman & Company.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-102	Credit Hours	3(2+1)
Course Title	Anatomy				

Course Introduction

This course, **Anatomy**, aims to provide students with a fundamental understanding of human anatomy, focusing on the structure of the human body and its systems. The course is designed to familiarize students with the major body structures, organs, and their functions. Students will also learn the relationship between anatomical structures and physiological processes, offering a solid foundation for further studies in health sciences and allied health fields.

Learning Outcomes

On the completion of the course, the students will:

- Gain a Fundamental Understanding of Human Anatomy: Develop knowledge of the structure and organization of the human body.
- Familiarize with Body Systems: Understand the structure and function of the major organ systems such as skeletal, muscular, circulatory, respiratory, digestive, and others.
- Master Anatomical Terminology: Learn and apply key anatomical terms related to body positions, directions, and planes.
- Explore the Relationship between Anatomy and Health: Recognize how anatomical knowledge is applied in diagnosing and treating health conditions in healthcare settings.
- Visualize the Human Body: Use visual aids such as models, diagrams, and 3D tools to understand and identify the body's structures.
- Understand the Levels of Biological Organization: Learn the levels of organization in the body, from cells to tissues, organs, and systems.
- Apply Knowledge to Health Sciences: Build a foundation for further studies in allied health fields by understanding how anatomy relates to physiology and patient care.

Course Content (Theory)		Assignments/Readings
Week 1	**Introduction to Basic Anatomy**: Overview of the course, significance of anatomy in health sciences.	"Introduction to Anatomy and Its Importance in Health"
	Anatomical Nomenclature: Anatomical terminology, body plan, and structure.	Read article: "Fundamentals of Anatomical Nomenclature and Terminology"
Week 2	**Life Span of a Human Being**: Developmental stages and anatomical changes over time.	Write a summary on "Anatomical Changes Through the Human Life Span"
	Structural and Functional Organization of the Body: Cells, tissues, organs, and systems.	"Levels of Biological Organization"
Week 3	**Terminology and Body Plan**: Understanding body orientation and anatomical planes.	Complete quiz on "Anatomical Directions and Planes"
	Systematic Anatomy: Overview of systematic anatomy and its relevance in healthcare.	Research paper on "Systematic Anatomy and Its Role in Diagnosis"
Week 4	**Basic Organization of the Body**: Introduction to body systems and their integration.	Prepare diagram: "Basic Organization of the Human Body"
	The Skin: Structure of hypodermis, dermis, epidermis; role of the skin in protection and regulation.	Read on "Skin Structure and Function"
Week 5	**Skin (Cont'd)**: Superficial fascia, deep fascia, structure of nails and hair, types of burns.	Case study on "Types of Burns and Treatment"
	The Musculoskeletal System: Overview of bones, muscles, and joints.	Write a report on "Components of the Skeletal System"
Week 6	**The Skeletal System**: Axial and appendicular skeleton, bone ossification, growth, remodeling, and repair.	Study guide: "Axial and Appendicular Skeleton"

	Main Features of the Skull: Skull features and their views. Shape and regions of the vertebral column.	Diagram: "Skull Features and Vertebral Column"
Week 7	**Fractures and Reduction Options**: Types of fractures and methods of reduction.	Group discussion: "Fracture Types and Treatment"
	Bones of the Upper and Lower Limb: Pectoral girdle, pelvic girdle, and their relation to limb movements.	Research paper: "Bones of the Pectoral Girdle and Upper Limb"
Week 8	**Types of Joints and Movements**: Various types of joints, joint movements, and classifications of synovial joints.	Assignment on "Types of Joints and Joint Movements"
	Connective Tissue and Cartilage: Components of the connective tissue matrix and cartilage.	Study on "Connective Tissue and Cartilage Types"
Week 9	**Muscles**: Structure and function of skeletal, smooth, and cardiac muscles.	Write a report on "Types of Muscles and Their Functions"
	Skeletal Muscle as Contractile Machinery: Sliding filament model of contraction.	Assignment: "Sliding Filament Theory of Muscle Contraction"
Week 10	**Origin, Insertion, and Types of Muscle Movements**: Understanding muscle action, synergists, antagonists, prime movers.	Case study on "Muscle Movement and Function"
	The Genito-Urinary System: Structures and organs of the urinary system, nephron structure, urine formation.	Read on "Structure of the Urinary System and the Nephron"
Week 11	**Urine Regulation**: Process of urine formation, regulation of urine concentration.	Research paper on "Urine Formation and Regulation"
	Formation of Sex Cells: Ovulation and spermatogenesis, reproductive system anatomy.	Assignment: "Ovulation and Spermatogenesis Process"
Week 12	**Male Reproductive System**: Structure and function of male reproductive organs.	Study guide on "Male Reproductive Anatomy"
	Female Reproductive System: Structure and function of female reproductive organs.	Write a report on "Anatomy and Function of the Female Reproductive System"
Week 13	**The Digestive System**: Structure of the digestive organs and their relationships with other organs.	Complete reading on "Digestive System Anatomy and Its Functions"
	Types of Digestion and Digestive Processes: Mechanical and chemical digestion.	Study: "Types of Digestion and Digestive Processes"
Week 14	**Secretory Glands in Digestion**: Liver, pancreas, and their exocrine and endocrine functions.	Research on "The Role of Liver and Pancreas in Digestion"
	Respiratory System: Anatomy of respiratory passages from nose to alveoli.	Diagram on "Respiratory Passage Structure"
Week 15	**Vocal Cords and Larynx**: Function of vocal cords, larynx, and voice production.	Write a report on "The Role of the Larynx in Voice Production"
	Respiratory and Conducting Zones: Different zones in the respiratory system.	Assignment on "Respiratory Zones and Their Functions"
Week 16	**The Nervous System**: Division of the nervous system, CNS, PNS, and autonomic nervous system.	Case study on "Central and Peripheral Nervous System"
	Special Senses: Olfactory system, hearing and balance, taste, vision, and touch.	Final exam review on "Special Senses and Nervous System Pathways"
Course Content (Lab)		**Assignments/Readings**
Week 1	**Labelling of Various Planes, Sections & Regions of the Human Body**: Identification and labelling exercises.	Read Chapter on "Planes, Sections, and Regions of the Human Body"
Week 2	**Skeletal System of the Human Body**: Study of human skeleton, labelling bones and understanding bone structure.	Review skeletal system and complete labelling exercises.
Week 3	**Identification of Bones**: Identification of compact,	Assignment: "Classification of Bone

	spongy, long, short, and sesamoid bones.	Types"
Week 4	**Identification of Various Types of Muscles**: Label and identify different muscle types: skeletal, smooth, and cardiac.	Study muscle types and complete muscle identification worksheets.
Week 5	**Identification of Various Organs of the Gastrointestinal System**: Label and identify organs of digestion.	Read on "Anatomy of the Gastrointestinal System"
Week 6	**Labelling of Anatomical and Functional Regions of the Nervous System**: Identification of brain regions and spinal cord.	Review the nervous system anatomy and complete labelling exercises on brain regions and functional areas.
Week 7	**Drawing and Labelling of Structures of the Genito-Urinary Tract System**: Study of male and female reproductive organs and urinary tract.	Complete diagram labelling on "Genito-Urinary System"
Week 8	**Differentiation Between Arteries, Veins, and Capillaries**: Visual identification and functional differentiation.	Read on "Difference Between Arteries, Veins, and Capillaries"
Week 9	**Demonstration of Structures on Models**: Explore anatomical models of human systems (skeletal, muscular, etc.).	Practical workbook on "Exploring Body Models"
Week 10	**Demonstration of Specimens**: Examination of preserved anatomical specimens to understand real human anatomy.	Assignment: "Analysis of Specimen Structures"
Week 11	**Spottings**: Identifying and labelling anatomical structures on prepared slides or models.	Review spotting guide for human anatomy structures.
Week 12	**Histology Slides**: Study of tissue slides to identify types of tissues in various organs.	Read on "Histology and Tissue Identification"
Week 13	**X-Ray Identification**: Interpretation and identification of anatomical structures from X-ray images.	Assignment: "Identifying Bones and Joints from X-rays"
Week 14	**Demonstration of Joint Movements**: Observation and analysis of joint movements on models or volunteers.	Write a report on "Types of Joint Movements and Their Functions"
Week 15	**Practical on Muscular Contractions**: Hands-on demonstration of muscle contractions and types of movements.	Study on "Muscle Contraction Mechanism and Types"
Week 16	**Final Practical Review**: Comprehensive review of all anatomical structures covered through models, specimens, and slides.	Final practical exam review: "Comprehensive Study of Human Anatomy"

Textbooks and Reading Material

- Singh, V. (2022). *General Anatomy- with Systemic Anatomy, Radiological Anatomy, Medical Genetics - E-book.* Elsevier Health Sciences.
- Drake, R. L., Vogl, A. W., & Mitchell, A. W. (2022). *Gray's Basic Anatomy - E-book.* Elsevier Health Sciences.
- Kay, S., Wilks, D., &McCombe, D. (2020). *Oxford Textbook of Plastic and Reconstructive Surgery and Anatomy.* Oxford University Press.
- Spratt, J. D., Salkowski, L. R., Loukas, M., Weir, J., Turmezei, T., & Abrahams, P. H. (2020). *Weir & Abrahams' Imaging Atlas of Human Anatomy.* Elsevier.
- Siddiqui, L. (2019). *General Anatomy.*
- Garg, K. (2019). *BD Chaurasia's Handbook of General Anatomy.* CBS Publishers & Distributors Pvt, India.
- Snell, R. S. (2018). *Snell's Clinical Anatomy.* Wolters Kluwer India Pvt.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback

on presentations.

- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-103	Credit Hours	3(2+1)
Course Title	Physiology				

Course Introduction

The **Physiology** course provides an understanding of the human body's functions and processes, focusing on the mechanisms that maintain homeostasis. It covers key systems such as cardiovascular, respiratory, musculoskeletal, and nervous systems, emphasizing the relationship between structure and function. The course includes practical sessions to measure vital parameters like blood pressure, pulse rate, ECG, and others, allowing students to apply theoretical concepts. Designed for students in allied health sciences, this course equips learners with essential knowledge and hands-on skills, preparing them for careers in healthcare and medical fields by exploring normal physiological processes and disease-related changes.

Learning Outcomes

On the completion of the course, the students will:

- Understand the fundamental physiological processes that maintain homeostasis in the human body.
- Explain the structure-function relationship in major organ systems like the cardiovascular, respiratory, digestive, and musculoskeletal systems.
- Demonstrate the ability to measure and interpret physiological parameters such as blood pressure, pulse rate, ECG, and others.
- Identify normal and abnormal physiological processes in various body systems.
- Apply knowledge of human physiology to healthcare, clinical diagnostics, and treatment approaches.
- Develop practical skills through laboratory experiments and real-world physiological measurements.
- Critically analyze physiological data and apply it to health and disease scenarios.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Human Physiology: Functional organization—structure and function relationship; Homeostasis, feedback mechanisms (negate ve& positive)	Read chapters on Homeostasis and Functional Organization from textbook.
	Integumentary System: Functions of skin, hair, glands, and nails; Body temperature regulation	Study the structure and functions of the skin, hair, and glands.
Week 2	Musculoskeletal System: Functions of bones and muscles; Characteristics of skeletal, smooth, and cardiac muscle	Review muscle types and their functions; muscle contraction mechanisms.
	Muscle Contraction: Muscle contraction & relaxation in response to action potentials; Aerobic vs anaerobic contraction	Read on muscle physiology and contraction types.
Week 3	Muscle Hypertrophy and Atrophy	Study muscle hypertrophy and atrophy mechanisms and factors.
	Blood: Composition of blood and plasma, functions, formed elements, stages of cell development	Review blood components, formation, and functions.
Week 4	Blood Grouping and Coagulation Mechanism	Study blood grouping and coagulation pathways.
	The Cardiovascular System: Functions of the heart; Electrical activity of the heart, origin of cardiac impulse	Review the heart's electrical activity and phases of the cardiac cycle.
Week 5	Phases of the Cardiac Cycle; Heart Sounds; Regulation of Heart Functions (Intrinsic & Extrinsic)	Study the cardiac cycle, heart sounds, and heart function regulation.
	Functions of Peripheral Circulation; Physiology of Circulation	Understand systemic and pulmonary circulation.
Week 6	Nervous Control of Blood Vessels; Regulation of Arterial Pressure	Read on the autonomic nervous system's role in vascular regulation.
	The Lymphatic System: Functions of tonsils, lymph nodes,	Study the lymphatic system and

	spleen, thymus	immune response.
Week 7	Immunity: Innate vs Adaptive immunity, antigens and antibodies, primary and secondary immune responses	Review immunity types, lymphocyte function, and immune responses.
	The Specialized Sense Organs: Eye—Physiology of sight, accommodation, optic nerve, and chiasma	Study the physiology of vision and related neural pathways.
Week 8	Ear—Functions of the inner, middle, and outer ear; Physiology of hearing and balance	Review ear structure and function, hearing, and balance mechanisms.
	Smell—Physiology of the Olfactory Nerve; Taste—Physiology of taste and speech	Study the physiology of smell, taste, and speech processes.
Week 9	Nervous System: Functions of the CNS, functional areas of the cerebral cortex	Review the organization and functions of the central nervous system.
	Brainstem, Diencephalon, Basal Nuclei, Limbic System, Cerebellum Functions	Study the parts of the brainstem and their roles in motor control.
Week 10	Functions of Cranial Nerves; Somatic Motor Nervous System and Autonomic Nervous System	Review cranial nerve functions and somatic vs autonomic nervous systems.
	Neurons, Neuroglial Cells, and Components; Resting Membrane Potential, Action Potential	Study neuronal function, synapses, and neuroglial roles.
Week 11	Synapse and Reflex Arc Function	Understand reflex arc pathways and neural transmission.
	Respiratory System: Functions, ventilation, lung volumes, gas exchange, rhythmic ventilation	Review respiratory mechanics and gas exchange in alveoli.
Week 12	Digestive System: Functions of digestive organs, salivary glands, and regulation of movements and secretions	Study the digestive process, from mouth to absorption in intestines.
	Physiology of Digestion, Absorption, and Transportation of Nutrients	Study the absorption and transportation of nutrients within the body.
Week 13	Genito-Urinary System: Urine production, movement, and regulation of urine concentration and volume	Review kidney function, fluid balance, and urine production.
	Body Fluid Compartments; Regulation of Extracellular Fluid Composition	Study fluid compartments and how the body regulates fluid balance.
Week 14	Regulation of Acid-Base Balance	Review how the body maintains pH balance through buffers and systems.
	Male Reproductive System: Spermatogenesis, reproductive glands, hormones, and regulation	Study the physiology of male reproductive system and hormonal regulation.
Week 15	Female Reproductive System: Ovulation, hormonal regulation	Review the female reproductive cycle, ovulation, and related hormones.
	Endocrine System: Hormones and their regulation	Study the function of hormones and their effects on bodily functions.
Week 16	Review of Human Physiology: Integration of organ systems and homeostasis	Study the overall integration of systems and regulation of homeostasis.
	Final Review and Discussion of Key Concepts	Prepare for final exam, review key concepts and physiological processes.

Course Content (Lab)		Assignments/Readings
Week 1	Determination of Human Pulse Rate	Read about pulse rate measurement techniques and factors influencing pulse.
Week 2	Determination of Blood Pressure (Auscultatory and Palpatory Methods)	Study the principles of blood pressure measurement and interpretation.
Week 3	The Effect of Exercise and Posture on Blood Pressure	Review the physiological effects of exercise and posture on blood pressure.
Week 4	Determination of Visual Acuity for Distant Vision	Study the anatomy of the eye and factors affecting visual acuity.
Week 5	Determination of Visual Acuity for Near Vision	Read on near vision assessment and common vision disorders.
Week 6	Study of Hemocytometer	Review the principles of using a hemocytometer for blood cell counting.
Week 7	Count the Total Number of RBCs/mm^3 of Your Own Blood	Study RBC counting techniques and normal ranges for blood cell counts.
Week 8	Examination of Cranial Nerves	Study the functions and assessments of cranial nerves.
Week 9	Use of the Microscope	Review microscope types, parts, and proper usage techniques.
Week 10	Blood Pressure Measurement	Study blood pressure measurement devices and techniques.
Week 11	Membrane Permeability Test	Review the concept of membrane permeability and factors affecting it.
Week 12	Phlebotomy: Techniques and Procedures	Study phlebotomy techniques and safety protocols.
Week 13	Measuring Bleeding Time (BT) and Clotting Time (CT)	Read about the physiological basis of BT and CT and their significance.
Week 14	Electrocardiogram (ECG)	Study ECG principles, electrode placement, and interpretation of waves.
Week 15	Prothrombin Time (PT) Measurement	Review the concept and clinical significance of Prothrombin Time testing.
Week 16	Activated Partial Thromboplastin Time (aPTT) Measurement	Study the role of aPTT in coagulation testing and its clinical applications.

Textbooks and Reading Material

- **Essentials of Anatomy and Physiology** (4th Edition), Authors: Valerie C. Seeley, Stephen W. Stephens, Philip Tate, Publisher: W.B. Saunders Company
- **Guyton and Hall Textbook of Medical Physiology** (14th Edition), Authors: John E. Hall, Arthur C. Guyton, Publisher: Elsevier
- **Human Physiology: An Integrated Approach** (9th Edition), Author: Dee UnglaubSilverthorn, Publisher: Pearson
- **Principles of Physiology** (7th Edition), Author: Michael L. Johnson Publisher: Elsevier
- **Boron &Boulpaep's Medical Physiology** (3rd Edition), Authors: Walter F. Boron, Emile L. Boulpaep, Publisher: Elsevier

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
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- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-104	Credit Hours	3 (3+0)
Course Title	Introduction to Sustainable Developmental Goals				

Course Introduction

This course offers a comprehensive exploration of the United Nations Sustainable Development Goals (SDGs), providing students with an in-depth understanding of their history, importance, and global impact. Focusing on the environmental, social, and economic challenges the SDGs aim to address, the course takes a multidisciplinary approach to highlight the interconnected nature of the goals. Students will gain insights into the core principles of sustainable development and learn practical strategies to contribute to the achievement of the SDGs at local, national, and global levels.

Learning Outcomes

On the completion of the course, the students will:

- Understand the history and significance of the United Nations Sustainable Development Goals (SDGs).
- Analyze the interconnectedness of the SDGs and their role in addressing global challenges.
- Explore the environmental, social, and economic dimensions of sustainable development.
- Evaluate the impact of SDGs at the local, national, and international levels.
- Develop practical strategies for advancing the SDGs in diverse contexts.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Sustainable Development	Readings on the historical context and evolution of sustainability.
	Understanding the Concept of Sustainable Development: Role of the United Nations	Review of key UN documents on sustainability.
	The Sustainable Development Goals (SDGs) Framework: Overview of the 17 SDGs	Study the 17 SDGs and their targets (UN SDG Report).
Week 2	Interconnectedness and Synergies among the SDGs	Analyze how SDGs interact with each other.
	Monitoring and Measuring SDG Progress	Research and report on global SDG progress.
	Environmental Sustainability: Clean Water and Sanitation	Case study on water access and sanitation efforts.
Week 3	Environmental Sustainability: Responsible Consumption and Production	Read articles on sustainable consumption patterns.
	Environmental Sustainability: Climate Action	Research current climate action initiatives.
	Environmental Sustainability: Life Below Water	Watch a documentary on marine life preservation.
Week 4	Environmental Sustainability: Life on Land	Analyze case studies on land conservation efforts.
	Social and Economic Dimensions of Sustainability: No Poverty and Zero Hunger	Read articles on poverty alleviation and food security.
	Social and Economic Dimensions of Sustainability: Good Health and Well-being	Review global health initiatives aligned with SDGs.
Week 5	Social and Economic Dimensions of Sustainability: Quality Education	Research educational programs targeting SDG 4.
	Social and Economic Dimensions of Sustainability: Gender Equality	Analyze case studies on gender equality in various countries.
	Social and Economic Dimensions of Sustainability: Decent Work and Economic Growth	Read reports on sustainable economic growth models.
Week 6	Social and Economic Dimensions of Sustainability:	Examine policies aimed at reducing

	Reduced Inequalities	inequalities.
	Social and Economic Dimensions of Sustainability: Peace, Justice, and Strong Institutions	Research the role of strong institutions in sustainable development.
	Localizing the SDGs: Case Studies of Successful SDG Implementation	Prepare a report on successful SDG localization examples.
Week 7	Tools and Methodologies for Localizing the SDGs	Study the methods for adapting SDGs to local contexts.
	Role of Civil Society in Localizing SDGs	Review the role of NGOs in SDG implementation.
	Role of Businesses in Localizing SDGs	Read on corporate social responsibility (CSR) and SDGs.
Week 8	Role of Governments in Localizing SDGs	Analyze policies for SDG integration at the national level.
	Global Citizenship and Personal Action: Individual and Collective Responsibilities	Watch a video on global citizenship and sustainable actions.
	Engaging in Sustainable Practices: Daily Life Choices	Create a sustainable living plan for yourself.
Week 9	Advocacy and Raising Awareness: The Role of Advocacy in SDGs	Write an essay on the importance of advocacy for SDGs.
	Review of Local, National, and Global SDG Strategies	Prepare a comparison report of SDG strategies at various levels.
	Assessment of SDG Achievements	Research and write about countries' SDG success stories.
Week 10	Understanding Challenges in SDG Implementation	Study the barriers to SDG achievement.
	Mid-Term Review	Review all SDGs covered; preparation for mid-term exam.
	Innovations and Future of Sustainable Development	Read about new technologies aiding sustainable development.
Week 11	SDGs and the Private Sector: Role of Corporations	Write a report on corporate initiatives towards SDGs.
	SDGs in Healthcare: Aligning Health Systems with SDGs	Research health systems supporting SDGs.
	SDGs in Education: Ensuring Access to Education for All	Prepare a case study on SDG 4 education initiatives.
Week 12	SDGs and Agriculture: Achieving Zero Hunger	Analyze agricultural models for SDG 2 achievement.
	SDGs and Climate Change Mitigation	Research climate change mitigation policies in SDG frameworks.
	SDGs and Biodiversity Conservation	Study efforts related to SDG 14 and SDG 15.
Week 13	Role of Technology in Advancing SDGs	Investigate technology's role in achieving SDGs.
	Global Partnerships for SDGs: International Cooperation	Research international SDG partnerships.
	Personal Action for SDGs: How to Contribute Locally	Develop a local SDG action plan.
Week 14	Global Action for SDGs: Engaging in International Networks	Read about global movements for SDGs.
	Reflections on Global Citizenship and SDG Impact	Prepare a reflection paper on personal experiences.
	Ethical Considerations in Sustainable Development	Read on ethical practices for achieving the SDGs.

Week 15	Challenges and Opportunities for SDG Achievements	Prepare a report on challenges faced by countries.
	SDG Advocacy and Communication: Tools for Change	Research communication strategies for SDGs.
	Evaluating SDG Policies and Their Effectiveness	Analyze the effectiveness of global SDG policies.
Week 16	Preparing for SDG Future: Prospects Beyond 2030	Study reports on the future of SDGs post-2030.
	Review of Sustainable Development Goals	Final review of all SDGs and their interconnectedness.
	Final Exam and Course Evaluation	Final exam covering all course content.

Textbooks and Reading Material

- **The Sustainable Development Goals: A Global, Local and Individual Perspective**, Author: Elizabeth H. C. N. (2017), Edition: 1st Edition, Year: 2017
- **Sustainable Development Goals: A Guide for Business and Policy**, Author: Nicholas A. Ashford, Christopher C. H. P. (2020), Edition: 1st Edition, Year: 2020
- **Sustainable Development: From Brundtland to Rio 2012**, Author: Peter Utting (2012) Edition: 1st Edition, Year: 2012
- **The United Nations and the Sustainable Development Goals**, Author: United Nations Publications, Edition: 1st Edition, Year: 2020
- **Environmental Sustainability: A Design Guide**, Author: M. R. A. Mann (2018), Edition: 1st Edition, Year: 2018
- **United Nations SDG Report** (Annual), Author: United Nations, Edition: Annual Report, Year: Latest Edition
- **Handbook of Research on Sustainable Development and Economics**, Author: M. M. F. J. McNutt (2021), Edition: 1st Edition, Year: 2021
- Pogge, T., &Sengupta, M. (2015). The Sustainable Development Goals: a plan for building a better world?. *Journal of Global ethics*, *11*(1), 56-64.
- Moss, S. (2016). *Planet Earth II*. Random House**.**

Teaching Learning Strategies

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   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
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   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
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4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	**Elements**	**Weightage**	**Details**

1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-105	Credit Hours	2 (2+0)
Course Title	Behavioral Sciences				

Course Introduction

Behavioural sciences in medicine explore the intersection between human behaviour and health, focusing on how psychological, social, and cultural factors influence well-being and illness. This field encompasses psychology, sociology, and psychiatry, aiming to understand patient behaviour, mental health, and the social determinants of health. By applying behavioural science principles, healthcare providers can improve patient care, enhance communication, and address mental health issues alongside physical conditions. Understanding these aspects allows for more effective treatment strategies, improved patient adherence, and the promotion of healthier lifestyles, ultimately leading to better health outcomes and a more holistic approach to medical practice.

Learning Outcomes

On the completion of the course, the students will:

- Identify and explain the impact of cultural and community contexts on health behaviours, beliefs, and outcomes, and demonstrate how physicians can effectively integrate this understanding into patient care.
- Gather a comprehensive and accurate patient history that fosters a therapeutic relationship, demonstrating self-awareness and reflective practice in the process.
- Use shared decision-making principles to clearly explain a patient's medical condition and treatment options, considering the patient's background, education, and belief systems.
- Provide patient-centered behavioural guidance, articulating the relevant theoretical model that underpins the chosen approach.
- Recognize the influence of social determinants of health on patient outcomes and integrate this knowledge into clinical decision-making and patient care.
- Acknowledge and report personal errors, analyze their potential causes, and develop a plan to minimize future risks.

Course Content (Theory)		Assignments/Readings
Week 1	**Introduction to Behavioral Sciences and its Importance in Health**: Overview of behavioral sciences and health care models	Introduction to Behavioral Sciences
	Bio-Psycho-Social Model of Health Care and the Systems Approach: Integration of biological, psychological, and social factors	Review article on the Bio-Psycho-Social model in health care systems
Week 2	**Normality Vs Abnormality**: Understanding the concepts of normal vs abnormal behavior in health contexts	Case study: Identify signs of normal and abnormal behaviors in medical practice
	Professionalism and Desirable Attitudes in Health Professionals: Ethical standards, communication, and empathy	Professionalism in Health Care
Week 3	**Life Cycle - Behavioral Aspects of Development through the Life Cycle**: Infancy and childhood behavior	Assignment: Behavioral development in infancy and childhood
	Life Cycle - Behavioral Aspects of Development: Adolescence and adulthood	Case study: Behavioral characteristics of adolescence and adulthood
Week 4	**Death and Dying and Bereavement**: Psychological aspects of death and grieving	Read article on Psychological Stages of Dying and prepare for class discussion
	Death and Dying: Coping with death, dying, and bereavement	Case discussion on coping mechanisms during bereavement

Week 5	**Biological Basis of Behavior**: Psychodynamic factors - Learning, Memory, and Thinking	Prepare summary of different learning theories and their application in health
	Psychological Basis of Behavior: Motivation, Personality, Intelligence, Emotions, and Stress	Assignment: Identify how stress impacts learning and memory in health professionals
Week 6	**Social Basis of Behavior**: Sociological aspects of health and illness (Social Class, Gender, Health Belief Model)	Read sociological perspectives on health beliefs and class differences in healthcare
	Social and Anthropological Basis of Behavior: Stigma, Sick Role, Ethnicity, and Groups	Group discussion: Impact of stigma and ethnicity on patient care
Week 7	**Anthropological Aspects of Health**: Cultural sensitivity in health assessment	Prepare for discussion on cultural differences in health assessment and healthcare delivery
	Health Disparity and Health Inequality: Exploring the gap in healthcare access and outcomes	Read article on health inequalities and prepare a reflection on its societal impact
Week 8	**Illness and Healthcare Professional Relationship**: Medical Communication	Role play: Doctor-patient communication skills and medical interview
	Non-Pharmacological Interventions: Counseling, therapies, and alternative approaches	Study the use of non-pharmacological interventions in clinical practice
Week 9	**Breaking Bad News**: Techniques and psychological reactions	Assignment: Write a reflection on techniques for delivering bad news in a healthcare setting
	Crisis Intervention: Approaches to managing medical crises and acute reactions	Read Chapter on Crisis Intervention in Healthcare
Week 10	**Coping with Disability**: Stress, anxiety, and self-help groups for disabled individuals	Prepare for class discussion on psychological reactions to disability
	Pain Management and Psychosocial Aspects of Disability: Understanding pain in a psychological context	Assignment: Analyze case studies involving psychosocial aspects of pain management
Week 11	**Doctor-Patient Relationship**: Psychological reactions in doctor-patient interactions	Role play: Exploring different models of doctor-patient relationships
	Treatment Adherence: Understanding the factors influencing patient adherence to treatment	Read and summarize article on treatment adherence and patient behavior
Week 12	**Psychological Reactions to Illness**: Emotional and psychological impacts of illness	Prepare a case study on psychological reactions to chronic illness
	Psychosocial Aspects of Disease and Illness: Impact on social life and mental health	Study the effects of chronic diseases on patients' psychosocial well-being
Week 13	**Psychosocial Aspects of Intellectual Disability**: Behavioral, emotional, and social factors	Assignment: Case study of intellectual disability in healthcare settings
	Mental Health and Behavioral Factors in Disease: Exploring mental health challenges in disease diagnosis	Discuss mental health aspects of chronic disease treatment and management
Week 14	**Models of Doctor-Patient Relationship**: Exploring different therapeutic approaches	Case discussion on models of doctor-patient relationships and treatment adherence

	Psychosocial Interventions: Non-medical approaches to treating illness	Prepare presentation on psychosocial interventions in chronic diseases
Week 15	**Psycho-trauma and PTSD**: Understanding trauma, stress responses, and PTSD in healthcare	Prepare a reflective essay on coping with PTSD in healthcare settings
	Psychological Reactions to Trauma: Medical trauma and the need for specialized care	Group discussion on psychological management of trauma and crisis situations in healthcare
Week 16	**Integration of Behavioral Science in Health Care**: Summary and review of psychosocial aspects of healthcare	Review all key concepts discussed in previous weeks
	Final Exam: Review and application of behavioral science in health	Final Exam covering course content

Textbooks and Reading Material

- Behavioral Science in Medicine, 2nd Ed. by Barbara Fadem (2012).
- Handbook of Behavioral Sciences, 3rd Ed. by M.H. Rana (2012).
- Integrating Behavioral Sciences in Healthcare, 2nd Ed. by Asma Humayun and Michel Herber (2011).
- Psychology and Sociology Applied to Medicine: An Illustrated Color Text, 3rd Ed. by Beth Alder (2004).

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-106	Credit Hours	3 (3+0)
Course Title	Medical Sociology				

Course Introduction

This course introduces key concepts related to norms, values, behavior, human society, the role of family, culture, and learning. It provides an understanding of the norms and behaviors within human societies and social groups, along with the process of socialization. The course also explores the psychological aspects of illness and disability, and their impact on society and culture. Additionally, it covers the role of clinical psychology in addressing speech and hearing disorders, as well as the methodologies for rehabilitating individuals with hearing impairments.

Learning Outcomes

On the completion of the course, the students will:

- **Understanding Social Norms and Values**: Demonstrate knowledge of the norms, values, and behaviors that shape human societies, social groups, and the process of socialization.
- **Psychological Impact of Illness and Disability**: Gain insights into the psychological aspects of illness and disability, and understand their impact on individuals and society within different cultural contexts.
- **Role of Family and Culure in Society**: Recognize the role of family structures and cultural influences in shaping behavior, values, and learning within human societies.
- **Clinical Psychology in Speech and Hearing Disorders**: Develop an understanding of the role of clinical psychology in diagnosing and treating speech and hearing disorders, and the rehabilitation process for individuals with hearing impairments.
- **Application of Knowledge in Rehabilitation**: Apply theoretical knowledge to real-world scenarios in the rehabilitation of patients with speech and hearing impairments, using appropriate clinical methodologies.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Human Society and Social Groups	Reading: Introduction to Sociology; Assignment: Describe the role of social groups in shaping individual behavior.
	Scope and Relationship with Other Sciences	Reading: Sociology and Its Relation to Other Sciences; Assignment: Write a paper on how sociology connects with medicine.
	Impermanent Forms of Association	Reading: Temporary and Dynamic Associations in Society; Assignment: Case study analysis on impermanent associations.
Week 2	Typologies for Group Behavior	Reading: Types of Groups in Society; Assignment: Discuss different typologies and their social implications.
	Human Aggregates	Reading: The Concept of Human Aggregates; Assignment: Identify and analyze an example of a human aggregate in a community.
	Group Behavior	Reading: How Groups Influence Individual Actions; Assignment: Observe and report on group behavior in a social setting.
Week 3	Introduction to Culture	Reading: The Definition of Culture in Sociology; Assignment: Cultural analysis of a specific community.
	The Form and Content of Culture	Reading: Forms and Content of Culture; Assignment: Compare and contrast different cultural forms.

	Factors in Cultural Variation	Reading: Cultural Variations and Influencing Factors; Assignment: Research paper on cultural differences and their social impact.
Week 4	Cultural Values and Social Norms	Reading: Cultural Values and Norms; Assignment: Survey on cultural values and social norms in your community.
	The Concept of Values	Reading: Understanding Social Values; Assignment: Reflect on personal social values and their origins.
	Social Norms and Their Impact	Reading: Social Norms and Deviance; Assignment: Discuss the role of social norms in controlling behavior.
Week 5	Personality and Socialization	Reading: The Development of Personality Through Socialization; Assignment: Analyze the impact of socialization on personality development.
	Class Structure and Its Functions	Reading: Social Class and Its Role in Society; Assignment: Evaluate class structure in your community.
	Social Mobility	Reading: Types and Mechanisms of Social Mobility; Assignment: Research and present on the social mobility trends in your region.
Week 6	The Structure and Function of Social Institutions	Reading: Functions of Social Institutions; Assignment: Study of key social institutions and their societal roles.
	Sociology of Family	Reading: The Sociology of Family; Assignment: Interview a family and analyze its structure and dynamics.
	Familial Structure and Functions	Reading: Family Structures and Their Functions in Society; Assignment: Write about changing family structures.
Week 7	Patterns of Family and Institutions	Reading: Family Patterns and Related Institutions; Assignment: Research paper on modern family structures.
	Deviant Behavior: Overview	Reading: Introduction to Deviant Behavior; Assignment: Discuss different forms of deviant behavior.
	Mental Subnormality	Reading: Mental Subnormality and Social Adaptation; Assignment: Case study on mental subnormality in society.
Week 8	Mental and Emotional Disorders	Reading: Types and Causes of Emotional Disorders; Assignment: Research paper on the social impact of emotional disorders.
	Suicide, Drug Addiction, Alcoholism, Criminal Behavior	Reading: The Sociology of Suicide, Addiction, and Crime; Assignment: Case study on the sociological aspects of addiction.

	General Theory of Deviant Social Behavior	Reading: Theories of Deviant Behavior; Assignment: Research paper on the social causes of deviant behavior.
Week 9	Psychological Aspects of Illness and Disability	Reading: Psychological Responses to Illness and Disability; Assignment: Study on how culture influences disability perception.
	Relevance of Illness and Disability to Society, Culture, and Industry	Reading: Disability and Its Impact on Society and Industry; Assignment: Investigate the challenges of people with disabilities in the workplace.
	Services and Legislation for the Sick and Disabled	Reading: Legal Rights of the Sick and Disabled; Assignment: Report on available services for disabled individuals in your area.
Week 10	Industrial Organization and Rehabilitation	Reading: Industrial Rehabilitation and Disability; Assignment: Case study on workplace adaptations for disabled employees.
	Rules and Trade Unions Affecting Rehabilitation	Reading: Trade Unions and Rehabilitation of Patients; Assignment: Research paper on union roles in healthcare settings.
	Definition of Clinical Psychology	Reading: Understanding Clinical Psychology; Assignment: Define clinical psychology and its importance in health care.
Week 11	Historical Development of Clinical Psychology	Reading: The History of Clinical Psychology; Assignment: Timeline of the development of clinical psychology as a field.
	Modern History of Clinical Psychology	Reading: Contemporary Clinical Psychology; Assignment: Research on the current trends in clinical psychology.
	Role of Clinical Psychology in Speech and Hearing Disorders	Reading: Clinical Psychology and Speech Therapy; Assignment: Report on the clinical psychologist's role in speech and hearing disorders.
Week 12	Methodology in Clinical Psychology	Reading: Clinical Psychology Methods; Assignment: Describe and analyze clinical psychological research methods.
	Importance of Studying Psychology of Learning in Communication Disorders	Reading: Learning Theories in Communication Disorders; Assignment: Write on the importance of learning theories in treatment of speech disorders.
	Case History and Clinical Interviewing	Reading: Clinical Interviews and Case Histories; Assignment: Prepare a case history for a hypothetical patient.
Week 13	Clinical Observation	Reading: Techniques in Clinical Observation; Assignment: Conduct an observation in a clinical setting and write a report.

	Types of Psychological Assessment	Reading: Psychological Testing and Assessments; Assignment: Research paper on different types of psychological assessments.
	Considerations for Speech and Hearing Disorders	Reading: Speech and Hearing Disorders in Clinical Psychology; Assignment: Case study on psychological considerations in speech therapy.
Week 14	Classification of Abnormal Behavior	Reading: Classifying Abnormal Behavior; Assignment: Research paper on the classifications of abnormal behavior.
	History, Need, and Rationale for Classification	Reading: Historical Perspectives on Abnormal Behavior Classification; Assignment: Discuss the historical development of classification systems.
	Diagnosis and Tests Used in Clinical Psychology	Reading: Diagnostic Tools in Clinical Psychology; Assignment: Review common diagnostic tests used in clinical practice.
Week 15	Interpretation of Test Results	Reading: Interpreting Psychological Tests; Assignment: Case study on test result interpretation.
	Theories of Conditioning	Reading: Theories of Classical and Operant Conditioning; Assignment: Discuss the relevance of conditioning theories to abnormal behavior.
	Review and Discussion on the Application of Sociological Theories in Medicine	Review: Summarize course content on sociological theories in healthcare.
Week 16	Course Wrap-Up and Case Study Discussions	Review: Final discussion of key topics; Assignment: Presentation of final case study analysis.
	Final Exam Preparation	Review: Prepare for final exam; Assignment: Study all course materials.
	Final Exam	Final Exam on all course contents.

Textbooks and Reading Material

- "Medical Sociology" by William C. Cockerham
- "The Sociology of Health and Illness" by Sarah Nettleton

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**

Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	**Elements**	**Weightage**	**Details**
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-107	Credit Hours	2 (2+0)
Course Title	Pakistan Studies				

Course Introduction

This course is designed to provide students with a comprehensive exploration of Pakistan`s identity, spanning geographical, historical, and cultural dimensions. It delves into the diverse landscapes, ancient civilizations, and rich cultural heritage that define Pakistan. Moreover, it examines the socio-cultural and political transformations in Pakistan over time including democratic transitions and military interventions. The aim of this course is to inculcate in students a nuanced understanding of Pakistan`s, present, and potential future trajectories, enabling them to critically evaluate the complex dynamics shaping the development.

Learning Outcomes

On the completion of the course, the students will:

1. Have enhanced knowledge of the geographical, historical, and political aspects of Pakistan.
2. Understand the society and culture of Pakistan.
3. Understand explain the Socio-economic developments in Pakistan.
4. Explore contemporary issues and challenges faced by Pakistan and their implications for the future..

Course Content

1. **Introduction to Pakistan**
   - Geographical location and significance.
   - Historical background ancient civilizations in the region.
   - Factors leading to the creation of Pakistan
2. **Political History of Pakistan:**
   - Formative phase.
   - Military interventions and democratic transitions.
3. **Geography of Pakistan:**
   - Physiography: Mountains, Plains, Plateaus, deserts, valleys and coastal areas.
   - River systems: Indus River and its tributaries.
   - Climatic regions of Pakistan.
4. **Society and Culture of Pakistan:**
   - Socio-cultural diversity.
   - Languages and literature of Pakistan.
5. **Economic Development of Pakistan:**
   - Agriculture and industrial sectors of Pakistan.
   - Economic challenges of Pakistan.

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-108	Credit Hours	3(2+1)
Course Title	Audiological Assessment and Disorders				

Course Introduction

This course provides an in-depth exploration of diseases related to the external, middle, and inner ear. It covers the risk factors, symptoms, and pathogenesis of various ear conditions, offering students a solid foundation for understanding and diagnosing ear-related health issues.

Learning Outcomes

On the completion of the course, the students will:

- Identify the risk factors associated with ear diseases.
- Recognize the symptoms and clinical signs of ear conditions.
- Understand the pathogenesis and mechanisms underlying ear diseases.
- Analyze the impact of external, middle, and inner ear disorders on hearing and health.
- Develop skills in diagnosing and recommending treatments for ear-related diseases.

	Course Content (Theory)	Assignments/Readings
Week 1	Anatomy of External Ear: Pinna/Auricle	Read: External Ear Anatomy
	Anatomy of External Ear: External Auditory Meatus	Study: Structure of the External Auditory Canal
Week 2	Anatomy of External Ear: Tympanic Membrane	Diagram labeling of the Tympanic Membrane
	Anatomy of Middle Ear: Walls of the Middle Ear	Study: Middle Ear Anatomy
Week 3	Anatomy of Middle Ear: Ossicles and Muscles	Read: Ossicular Chain and Muscles
	Anatomy of Middle Ear: Function of Middle Ear Muscles	Assignment: Function of Middle Ear Structures
Week 4	Anatomy of Eustachian Tube: Structure and Function	Study: Role of Eustachian Tube in Pressure Equalization
	Inner Ear: Bony Labyrinth	Read: Bony Labyrinth Structure
Week 5	Inner Ear: Membranous Labyrinth	Study: Membranous Labyrinth and its Functions
	Inner Ear: Structure of Cochlea	Assignment: Diagram of Cochlea Structure
Week 6	Anatomy of Cochlea: Scala Vestibuli, Scala Media, and Scala Tympani	Read: Cochlear Structure and Fluid Pathways
	Organ of Corti: Structure and Function	Study: Organ of Corti and Hair Cells
Week 7	Structure and Types of Hair Cells in Cochlea	Study: Inner and Outer Hair Cells in Cochlea
	Vestibular Cochlear Nerve: Anatomy and Function	Read: Vestibular and Cochlear Nerve Pathways
Week 8	Nerve Pathway for Hearing	Assignment: Pathway of Auditory Impulses from Cochlea to Brain
	Conditions Related to Cochlea and Vestibule: Hearing Loss and Disorders	Study: Cochlear and Vestibular Pathologies
Week 9	Pathophysiology of Cochlear and Vestibular Disorders	Read: Pathophysiology of Auditory Disorders
	Audiological Findings in Cochlear Disorders	Assignment: Interpretation of Audiological Results
Week 10	Management of Cochlear and Vestibular Disorders	Study: Treatment Options for Cochlear Disorders

	Pathophysiology of Conductive Hearing Loss	Read: Conductive vs Sensorineural Hearing Loss
Week 11	Audiological Findings in Conductive Hearing Loss	Study: Audiogram Interpretation
	Management of Conductive Hearing Loss	Read: Surgical and Non-Surgical Treatments for Conductive Loss
Week 12	Pathophysiology of Sensorineural Hearing Loss	Study: Causes of Sensorineural Hearing Loss
	Audiological Findings in Sensorineural Hearing Loss	Assignment: Differentiating between Conductive and Sensorineural Loss
Week 13	Management of Sensorineural Hearing Loss	Study: Hearing Aids, Cochlear Implants, and Rehabilitation
	Vestibular Disorders: Pathophysiology and Clinical Signs	Read: Vestibular System Disorders
Week 14	Audiological Findings in Vestibular Disorders	Study: Vestibular Testing Techniques
	Management of Vestibular Disorders	Assignment: Treatment for Vertigo and Dizziness
Week 15	Clinical Evaluation of Hearing and Balance	Read: Clinical Methods for Assessment
	Pediatric Audiology: Assessment and Disorders	Study: Audiological Testing in Children
Week 16	Geriatric Audiology: Assessment and Disorders	Read: Hearing Loss in Older Adults
	Advances in Audiology and Hearing Rehabilitation	Study: Emerging Technologies in Audiology
Course Content (Lab)		**Assignments/Readings**
Week 1	External Ear Examination	Practice: Inspecting Pinna and External Auditory Canal
Week 2	Tympanic Membrane Inspection	Practical: Using Otoscope for Tympanic Membrane Examination
Week 3	Middle Ear Examination	Practice: Identifying Middle Ear Conditions via Otoscopy
Week 4	Eustachian Tube Function Test	Practical: Performing and Interpreting Valsalva Maneuver
Week 5	Pure Tone Audiometry	Practice: Conducting Audiometry for Air and Bone Conduction
Week 6	Tympanometry	Practical: Performing Tympanometric Measurements
Week 7	Acoustic Reflex Testing	Practice: Testing and Interpreting Acoustic Reflexes
Week 8	Otoacoustic Emissions (OAE) Test	Practical: Conducting OAE to Test Cochlear Function
Week 9	Auditory Brainstem Response (ABR) Testing	Practice: Setting up and Interpreting ABR Results
Week 10	Hearing Loss Classification	Practical: Classifying Hearing Loss based on Audiograms
Week 11	Speech Audiometry	Practical: Performing Speech Reception and Recognition Tests
Week 12	Vestibular Testing	Practice: Performing Basic Vestibular Function Tests
Week 13	Cochlear Implant Candidacy Evaluation	Practical: Evaluating Candidates for Cochlear Implants
Week 14	Use of Hearing Aids	Practical: Fitting and Adjusting Hearing Aids

Week 15	Assessment in Pediatric Audiology	Practical: Conducting Audiometric Tests on Children
Week 16	Geriatric Audiological Assessment	Practical: Conducting Audiological Tests for Elderly Patients

Textbooks and Reading Material

Theory Books:

- **Principles of Audiology in Medicine, Author:**Jerger, J., &Jerger, S., **Edition:** 5th Edition, **Year:** 2018, **Description:** This comprehensive textbook covers various aspects of audiology, including the anatomy of the ear, pathophysiology, audiological assessment, and treatment modalities for hearing disorders.
- **Clinical Audiology: A Practical Guide, Author:**Medwetsky, L., & McBride, C., **Edition:** 4th Edition, **Year:** 2020, **Description:** This book offers an in-depth exploration of audiological assessment techniques and audiometry, focusing on both diagnostic and therapeutic approaches.
- **The Audiogram: A Guide to Interpretation, Author:** K. V. Srinivasan, **Edition:** 2nd Edition, **Year:** 2019, **Description:** A practical guide on interpreting audiograms, this book includes case studies and sample audiometric data for a clearer understanding of hearing disorders.

Practical Books:

- **Manual of Audiological Diagnosis, Author:** Jack Katz, **Edition:** 3rd Edition, **Year:** 2021, **Description:** This book serves as a comprehensive manual for both students and practitioners in audiology, with a focus on diagnostic procedures in hearing and balance disorders.

Teaching Learning Strategies

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3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
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2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-109	Credit Hours	3(2+1)
Course Title	Audiological Theory & Practice				

Course Introduction

"Audiological Theory and Practice" is an advanced-level course designed to offer an in-depth exploration of the theoretical foundations, diagnostic methodologies, and clinical applications in the field of audiology. This course provides students with a comprehensive understanding of the auditory and vestibular systems, equipping them with the expertise required to assess, diagnose, and manage a wide range of hearing and balance disorders. Through a combination of theoretical study and hands-on practice, students will develop the necessary skills to apply audiological concepts to real-world clinical scenarios and deliver effective patient care.

Learning Outcomes

On the completion of the course, the students will:

- Demonstrate a deep understanding of the theoretical principles underlying audiology, including the anatomy and physiology of the auditory and vestibular systems.
- Apply advanced diagnostic techniques to assess hearing and balance disorders across a variety of patient populations.
- Analyze audiological test results, interpret findings, and develop appropriate management plans for patients with hearing and balance disorders.
- Utilize evidence-based approaches in the diagnosis and treatment of audiological conditions.
- Communicate effectively with patients, families, and interdisciplinary healthcare teams regarding audiological assessments and treatment options.
- Understand the ethical considerations and professional responsibilities in the field of audiology.
- Critically evaluate current research in audiology and its clinical applications to inform best practices.

Course Content (Theory)		Assignments/Readings
Week 1	**Introduction to Audiology**: Definition of hearing, definition of an audiologist, objectives of audiology, responsibilities of audiologist, scope of practice of audiology.	Read introductory chapters from the textbook on Audiology Basics.
	The Ear: Overview of the ear anatomy: Outer ear, Middle ear, Inner ear.	Study the anatomy of the ear and its subdivisions.
Week 2	**Outer Ear - Anatomical Structures**: Pinna, External auditory canal, Tympanic membrane.	Review diagrams and functions of the outer ear.
	Middle Ear - Anatomical Structures: Ossicles, Tympanic muscles, Middle ear cavity, Eustachian tube, Landmarks of middle ear.	Read about the role of the middle ear structures in hearing.
Week 3	**Inner Ear - Osseous Vestibule & Semicircular Canals**: Osseous vestibule, Osseous semicircular canals, Osseous cochlear labyrinth.	Study the structure and function of the inner ear.
	Inner Ear - Membranous Labyrinth and Bony Labyrinth: Overview of membranous labyrinth, bony labyrinth, and inner ear fluids.	Review the circulation of inner ear fluids.
Week 4	**Auditory System**: Peripheral receptors, physiology of auditory system, Organ of Corti.	Read the textbook sections on the auditory system and cochlea.
	Auditory System - Nerve Supply of Hair Cells: Mechanism of hearing, nerve supply of hair cells.	Study the physiology of hair cells and their role in hearing.
Week 5	**Auditory Pathway**: Auditory neural pathway and their nuclei, from cochlear nerve to auditory cortex.	Study the neural pathway for sound processing.
	Vestibular System: Physiology of the vestibular system and its role in balance.	Read about the vestibular system and balance mechanisms.
Week 6	**Ear Anatomy Review**: Review of ear anatomy: outer, middle, and inner ear.	Review all previous readings on ear anatomy.

	Introduction to Eye Anatomy: Position and structure of the lacrimal apparatus, eye functional implications.	Study the lacrimal apparatus and its role in eye health.
Week 7	**Retina and Optic Nerve**: Structure of the retina, optic nerve pathway.	Review the structure and function of the retina and optic nerve.
	Light and Accommodation Reflex: Basic understanding of light reflex and accommodation reflex (pathway omitted).	Study the processes of light and accommodation reflex.
Week 8	**Extraocular Muscles**: Nerve supply, actions of extraocular muscles, their role in eye movement.	Review the actions of extraocular muscles and their nerve supply.
	Review and Consolidation: Final revision of all topics covered in theory.	Complete all pending assignments and readings.
Week 9	**Introduction to Audiology**: Definition of hearing, definition of an audiologist, objectives of audiology, responsibilities of audiologist, scope of practice of audiology.	Read introductory chapters from the textbook on Audiology Basics.
	The Ear: Overview of the ear anatomy: Outer ear, Middle ear, Inner ear.	Study the anatomy of the ear and its subdivisions.
Week 10	**Outer Ear - Anatomical Structures**: Pinna, External auditory canal, Tympanic membrane.	Review diagrams and functions of the outer ear.
	Middle Ear - Anatomical Structures: Ossicles, Tympanic muscles, Middle ear cavity, Eustachian tube, Landmarks of middle ear.	Read about the role of the middle ear structures in hearing.
Week 11	**Inner Ear - Osseous Vestibule & Semicircular Canals**: Osseous vestibule, Osseous semicircular canals, Osseous cochlear labyrinth.	Study the structure and function of the inner ear.
	Inner Ear - Membranous Labyrinth and Bony Labyrinth: Overview of membranous labyrinth, bony labyrinth, and inner ear fluids.	Review the circulation of inner ear fluids.
Week 12	**Auditory System**: Peripheral receptors, physiology of auditory system, Organ of Corti.	Read the textbook sections on the auditory system and cochlea.
	Auditory System - Nerve Supply of Hair Cells: Mechanism of hearing, nerve supply of hair cells.	Study the physiology of hair cells and their role in hearing.
Week 13	**Auditory Pathway**: Auditory neural pathway and their nuclei, from cochlear nerve to auditory cortex.	Study the neural pathway for sound processing.
	Vestibular System: Physiology of the vestibular system and its role in balance.	Read about the vestibular system and balance mechanisms.
Week 14	**Ear Anatomy Review**: Review of ear anatomy: outer, middle, and inner ear.	Review all previous readings on ear anatomy.
	Introduction to Eye Anatomy: Position and structure of the lacrimal apparatus, eye functional implications.	Study the lacrimal apparatus and its role in eye health.
Week 15	**Retina and Optic Nerve**: Structure of the retina, optic nerve pathway.	Review the structure and function of the retina and optic nerve.
	Light and Accommodation Reflex: Basic understanding of light reflex and accommodation reflex (pathway omitted).	Study the processes of light and accommodation reflex.
Week 16	**Extraocular Muscles**: Nerve supply, actions of extraocular muscles, their role in eye movement.	Review the actions of extraocular muscles and their nerve supply.
	Review and Consolidation: Final revision of all topics covered in theory.	Complete all pending assignments and readings.
Course Content (Lab)		**Assignments/Readings**
Week 1	**Introduction to Audiology Equipment**: Familiarization with basic audiology instruments.	Demonstration of basic audiology tools (otoscope, tuning fork).

Week 2	**Outer Ear Examination**: Practical examination of outer ear anatomy.	Conduct a visual inspection of the pinna, external auditory canal, and tympanic membrane using otoscopy.
Week 3	**Middle Ear Examination**: Testing of middle ear function, identifying landmarks.	Conduct a physical examination of the middle ear structures using tympanometry.
Week 4	**Inner Ear Anatomy**: Practical demonstration of cochlear structures through models or simulations.	Examine and identify the inner ear structures in models or images.
Week 5	**Hearing Tests**: Introduction to basic audiometric testing (Pure Tone Audiometry).	Conduct pure tone audiometry on a volunteer.
Week 6	**Speech Audiometry**: Introduction to speech audiometry tests and their interpretation.	Perform speech recognition tests and evaluate results.
Week 7	**Vestibular Function Test**: Introduction to vestibular system testing methods.	Perform basic tests for vestibular function (e.g., caloric test).
Week 8	**Ear Canal and Tympanic Membrane Assessment**: Practical demonstration of ear canal and tympanic membrane assessment using otoscope.	Practice performing otoscopic examination on peers.
Week 9	**Audiogram Interpretation**: Understanding audiogram results and making clinical decisions.	Analyze and interpret audiogram results from sample cases.
Week 10	**Calibration of Audiometers**: Learn calibration standards for audiometers.	Hands-on experience with audiometer calibration and troubleshooting.
Week 11	**Practical Application of Hearing Aids**: Demonstration and fitting of hearing aids.	Demonstrate the fitting and basic troubleshooting of hearing aids.
Week 12	**Testing Vestibular System**: Hands-on vestibular system testing, including ENG (electronystagmography).	Perform ENG on a volunteer and interpret the findings.
Week 13	**Practical Assessment of Eye Structures**: Demonstration of eye anatomy using models or equipment.	Perform a basic eye examination using a direct ophthalmoscope.
Week 14	**Eye Reflex Testing**: Conducting light and accommodation reflex tests on a subject.	Perform and document light and accommodation reflexes.
Week 15	**Extraocular Muscle Function Test**: Testing the function of extraocular muscles.	Conduct muscle function tests to check for eye movement abnormalities.
Week 16	**Final Practical Exam**: Comprehensive practical exam covering all topics of Audiology and Eye Anatomy.	Conduct a full practical exam involving hearing and eye tests.

Textbooks and Reading Material

- Pediatric Audiology: Diagnosis, Technology, and Management by Susan Nittrouer
- The Auditory Brainstem Response by Jack Katz
- Handbook of Clinical Audiology by Jack Katz
- Clinical Audiology: An Introduction by H. Steven Colburn, Michael A. A. Williams

Practical Guides:

- **The Handbook of Speech-Language Pathology by Jack C. DePippo,** while focused on speech-language pathology, this book also covers aspects of audiology, particularly in the context of language development and disorders related to hearing loss.
- **Rehabilitation of the Hearing Impaired Adult by M. Neil McCarty:** A great practical guide for audiologists working in the rehabilitation of adults with hearing impairments, covering hearing aids, assistive technologies, and counseling strategies.

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.

3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-201	Credit Hours	2(2+0)
Course Title	Medical Ethics				

Course Introduction

The course on Medical Ethics and Biosafety aims to provide students with a comprehensive understanding of the ethical principles and practices in medical and healthcare settings. Students will be trained to effectively navigate various professional roles related to medical ethics, including psychotherapy, psychological assessment, and clinical research. Additionally, the course will introduce key concepts and practices of biosafety, ensuring that students are equipped with the knowledge to handle biological risks responsibly. Through this course, students will develop the skills needed to address complex ethical issues and apply biosafety principles in both clinical and research environments.

Learning Outcomes

On the completion of the course, the students will:

- Demonstrate a thorough understanding of the foundational principles and frameworks in medical ethics, including autonomy, justice, beneficence, and non-maleficence.
- Apply ethical principles to real-world scenarios in psychotherapy, psychological assessment, and clinical research.
- Identify and analyze ethical dilemmas in medical practice, offering appropriate and well-reasoned solutions.
- Understand and implement best practices in biosafety, including risk assessment, prevention, and management of biological hazards.
- Integrate ethical and biosafety considerations into clinical decision-making and research protocols.
- Exhibit professionalism in dealing with ethical issues in healthcare settings, while adhering to relevant regulations and guidelines.
- Develop an awareness of cultural, social, and legal factors influencing medical ethics and biosafety practices.

	Course Content (Theory)	Assignments/Readings
Week 1	**Medical Ethics: Introduction** - Overview of Hippocratic Oath - Do's and Don'ts of Medical Ethics	Reading: Hippocratic Oath and Ethical Guidelines Assignment: Write a reflection on the importance of the Hippocratic Oath in modern healthcare practice.
	Concept of Allied Health Ethics - Role and Responsibilities of Allied Health Professionals	Reading: Allied Health Ethics Overview Assignment: Research and submit a report on ethical dilemmas faced by allied health professionals.
Week 2	**Psychological Reactions to Illness** - Grief and Bereavement - Family and Illness	Reading: Psychological Reactions to Illness Assignment: Case study on family reactions to illness and how they affect treatment outcomes.
	Dealing with Difficult Patients - Psychosocial Aspects of Illness, Trauma, and Hospitalization	Reading: Psychosocial Aspects of Illness and Hospitalization Assignment: Role-play scenario where you handle a difficult patient in a healthcare setting. Write a reflection.
Week 3	**Psychosocial Issues in Healthcare Settings** - Emergency Departments - Intensive Care and Coronary Care Units	Reading: Psychosocial Issues in Emergency and Critical Care Assignment: Analyze a case study about a critically ill patient and psychosocial challenges faced.
	Psychosocial Aspects of Specific Illnesses - Rape, Torture, Terminal Illness, Death and Dying	Reading: Psychosocial Issues in Terminal Illness and Trauma

		Assignment: Prepare a presentation on the psychosocial impact of terminal illness and death on patients and families.
Week 4	**Breaking Bad News: Introduction** - Models and Methods of Breaking Bad News	Reading: Models for Breaking Bad News in Healthcare Assignment: Write a script on how to break bad news to a patient or family member.
	Breaking Bad News: Patient Death, Abnormal Babies, Intractable Illness - Techniques and Sensitivity	Reading: Effective Communication in Difficult Situations Assignment: Analyze a scenario where bad news is delivered. Discuss the effectiveness of the approach.
Week 5	**Pain Management** - Concept of Pain, Sleep, and Consciousness	Reading: Pain Physiology and Management Techniques Assignment: Write a report on pain management strategies used in critical care settings.
	Altered States of Consciousness - Understanding Pain, Sleep Disturbances, and Consciousness Changes	Reading: Altered States of Consciousness and Pain Management Assignment: Case study on altered consciousness due to trauma or illness. Suggest management strategies.
Week 6	**Communication Skills: Introduction** - Counseling, Crisis Intervention, and Conflict Resolution	Reading: Crisis Intervention and Counseling Techniques Assignment: Role-play a crisis intervention scenario and submit a reflection on the approach used.
	Principles of Effective Communication - Active Listening, The Art of Questioning	Reading: Principles of Communication in Healthcare Assignment: Complete an active listening exercise with a peer and submit a summary of your experience.
Week 7	**The Art of Listening and Questioning** - Good vs. Bad Listening Skills	Reading: Techniques for Active Listening Assignment: Submit a video demonstrating good and bad listening skills in a healthcare setting.
	Counseling: Scope, Indications, and Contraindications - Do's and Don'ts of Counseling	Reading: Counseling Techniques in Healthcare Assignment: Write a case study analysis on a counseling session in a healthcare setting, identifying key techniques.
Week 8	**Dealing with Real-Life Crises and Conflict in Healthcare** - Healthcare Crisis Management	Reading: Managing Crises and Conflicts in Healthcare Assignment: Write a report on how to handle a real-life crisis in healthcare, focusing on communication strategies.
	Biosafety in Laboratories - Introduction to Laboratory Response Network and Risk Assessment	Reading: Laboratory Biosafety Principles Assignment: Research biosafety levels in laboratories and submit a report on the key differences between them.

Week 9	**Laboratory Response Network: Sentinel, Reference, and National Laboratories**	Reading: Role of Sentinel Laboratories Assignment: Write a research paper on the role of sentinel laboratories in managing public health crises.
	Laboratory Risk Assessment - Step 1: Identification of Hazards - Step 2: Evaluation and Prioritization of Risks	Reading: Laboratory Risk Assessment Guidelines Assignment: Conduct a mock risk assessment for a laboratory setting and submit your findings.
Week 10	**Risk Mitigation Strategies** - Step 3: Risk Mitigation Strategies	Reading: Risk Mitigation in Laboratories Assignment: Develop a risk mitigation plan for a laboratory based on identified hazards.
	Implementing Control Measures and Review of Risk Assessment - Step 4: Implement Control Measures - Step 5: Review and Final Assessment	Reading: Review and Finalizing Risk Assessment in Laboratories Assignment: Submit a final review of a risk assessment and control measures for a laboratory.
Week 11	**Laboratory Biosafety Levels (BSL-1 to BSL-4)** - Overview of Biosafety Levels 1-4	Reading: Biosafety Levels Overview Assignment: Create an infographic showing the differences between biosafety levels.
	Personal Protective Equipment (PPE) - Coats, Gloves, Eye and Face Protection	Reading: PPE Guidelines in Laboratory and Healthcare Settings Assignment: Submit a report on the importance of PPE in biosafety and infection control.
Week 12	**Donning and Doffing PPE** - Proper Procedures, Exposure Monitoring	Reading: Safe Donning and Doffing Procedures Assignment: Create a video demonstrating the correct procedures for donning and doffing PPE.
	Disinfection and Biological Spill Cleanup - Cleaning Laboratory Surfaces, Equipment, and Workspaces	Reading: Laboratory Disinfection and Spill Management Assignment: Write a report on the procedures for cleaning up a biological spill in a laboratory.
Week 13	**Routes of Transmission in Laboratories** - Contact, Bloodborne, Droplet, Airborne Transmission	Reading: Infection Control and Transmission in Labs Assignment: Create a diagram explaining the different transmission routes in laboratory settings.
	Safe Handling of Clinical Specimens - Processing and Manipulation of Microbial Cultures	Reading: Specimen Handling and Safety Protocols Assignment: Submit a report on the safe handling and processing of clinical specimens in a laboratory.
Week 14	**Biomedical Waste Management: Overview** - Types of Biomedical Waste (Liquid, Pathological, Sharp, Non-Pathological, etc.)	Reading: Biomedical Waste Management Basics Assignment: Write an essay on the different types of biomedical waste and their proper disposal methods.
	Disposal of Biomedical Wastes	Reading: Safe Disposal Practices for

	- Pathological, Sharp, Non-Pathological Wastes	Biomedical Waste Assignment: Conduct a survey on biomedical waste disposal practices in your local healthcare facilities and report findings.
Week 15	**Disposal of Liquid and Radioactive Biomedical Waste**	Reading: Handling Liquid and Radioactive Waste Safely Assignment: Prepare a presentation on the safety protocols for disposing of liquid and radioactive biomedical waste.
	Disposal of Non-Pathological and Non-Sharp Solid Wastes - Procedures for Safe Disposal	Reading: Solid Waste Disposal in Healthcare Settings Assignment: Develop a flowchart detailing the steps for disposing of non-pathological biomedical waste.
Week 16	**Biomedical Waste Decontamination** - Decontamination and Disposal Procedures	Reading: Decontamination Techniques in Healthcare Assignment: Create a report on decontamination procedures for healthcare workers handling biomedical waste.
	Review and Recap of Medical Ethics and Biosafety - Key Learnings and Best Practices in Healthcare Ethics and Biosafety	Review of All Lectures and Case Studies Assignment: Write a final reflective paper on the key learnings from the course, focusing on how ethics and biosafety impact healthcare practice.

Textbooks and Reading Material

- Rhodes, R. (2020). *The trusted doctor: Medical ethics and professionalism*. Oxford University Press.
- Byers, K. B., & Wooley, D. P. (Eds.). (2020). *Biological safety: principles and practices*. John Wiley & Sons

Teaching Learning Strategies

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Assignments: Types and Number with Calendar

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2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details

1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
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3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-202	Credit Hours	3(2+1)
Course Title	Basic Pathology				

Course Introduction

The Basic Pathology course introduces students to the mechanisms of disease, including etiology, pathogenesis, and clinical manifestations. It covers cellular, tissue, and organ changes in response to diseases, diagnostic techniques, and their impact on public health. This foundational knowledge is essential for careers in medicine, healthcare, and related fields.

Learning Outcomes

On the completion of the course, the students will:

- Understand the fundamental principles of pathology, including etiology, pathogenesis, and clinical manifestations.
- Identify common pathological changes at the cellular, tissue, and organ levels.
- Recognize the relationship between disease mechanisms and clinical symptoms.
- Apply basic diagnostic techniques in pathology.
- Explain the impact of diseases on human health and healthcare systems.

Course Content (Theory)		Assignments/Readings
Week 1	Pathology: Introduction to Basic Pathology	Read introductory materials on Pathology
	Cell Injury and Death: Causes of Cell Injury	Review materials on causes of cell injury
Week 2	Cell Injury and Death: Necrosis	Review content on necrosis
	Cell Injury and Death: Apoptosis	Review content on apoptosis
Week 3	Cell Injury and Death: Subcellular Responses	Read materials on subcellular responses
	Cell Adaptations: Hyperplasia	Review materials on hyperplasia
Week 4	Cell Adaptations: Hypertrophy	Study hypertrophy and its mechanisms
	Cell Adaptations: Atrophy	Study atrophy and its mechanisms
Week 5	Cell Adaptations: Metaplasia	Study metaplasia and its mechanisms
	Cell Adaptations: Intracellular Accumulation	Review materials on intracellular accumulation
Week 6	Inflammation: Acute Inflammation - Vascular Events	Review vascular events in acute inflammation
	Inflammation: Acute Inflammation - Cellular Events	Review cellular events in acute inflammation
Week 7	Inflammation: Acute Inflammation - Chemical Mediators	Study chemical mediators in acute inflammation
	Inflammation: Chronic Inflammation - General	Review chronic inflammation and its general features
Week 8	Inflammation: Chronic Inflammation - Granulomatous	Study granulomatous inflammation
	Inflammation: Chronic Inflammation - Morphologic Patterns	Study morphologic patterns of chronic inflammation
Week 9	Healing and Repair: Normal Controls	Review normal control mechanisms in healing and repair
	Healing and Repair: Repair by Connective Tissue	Study connective tissue repair mechanisms

Week 10	Healing and Repair: Wound Healing	Review wound healing processes
	Haemodynamic Disorders: Edema	Study the pathophysiology of edema
Week 11	Haemodynamic Disorders: Hyperemia / Congestion	Review hyperemia and congestion mechanisms
	Haemodynamic Disorders: Hemorrhage	Study hemorrhage and its types
Week 12	Haemodynamic Disorders: Thrombosis	Study thrombosis and its pathophysiology
	Haemodynamic Disorders: Embolism	Study embolism and its consequences
Week 13	Haemodynamic Disorders: Infarction	Review infarction mechanisms and effects
	Haemodynamic Disorders: Shock	Study shock and its clinical aspects
Week 14	Diseases of Immunity: General Features	Review general features of immune disorders
	Diseases of Immunity: Hypersensitivity Reactions	Study hypersensitivity reactions
Week 15	Diseases of Immunity: Immune Deficiencies	Review immune deficiencies and related disorders
	Diseases of Immunity: Autoimmunity, Amyloidosis	Study autoimmune diseases and mechanisms, Study amyloidosis and its clinical impact
Week 16	Neoplasia: Nomenclature, Molecular Basis, Carcinogenic Agents, Clinical Aspects	Review cancer nomenclature, molecular basis, and carcinogenic agents
	Common Pathologies: Pathology of the Heart Common Pathologies: Pathologies of the Oral Cavity Common Pathologies: Pathology of the GIT Common Pathologies: Pathology of the Respiratory System Common Pathologies: Pathology of the CNS Common Pathologies: Pathology of the CVS	Study pathology related to heart diseases Review pathologies of the oral cavity Study gastrointestinal tract pathologies Review respiratory system pathologies Study central nervous system pathologies Review cardiovascular system pathologies
Course Content (Lab)		**Assignments/Readings**
Week 1	Introduction to General Pathology, Causes of Cell Injury	Introduction to Pathology Lab techniques
Week 2	Necrosis and Apoptosis	Microscopic examination of necrosis and apoptosis
Week 3	Subcellular Responses to Cell Injury	Practical examples of subcellular changes
Week 4	Hyperplasia and Hypertrophy	Identification of cell adaptations under the microscope
Week 5	Atrophy, Metaplasia, and Intracellular Accumulation	Observation of atrophic and metaplastic changes
Week 6	Acute Inflammation: Vascular Events	Microscopic study of acute inflammation and vascular changes
Week 7	Acute Inflammation: Cellular Events and Chemical Mediators	Identification of inflammatory cells and chemical mediators

Week 8	Chronic Inflammation: General Features, Granulomatous Inflammation	Microscopic examination of chronic inflammation and granulomas
Week 9	Morphologic Patterns of Acute and Chronic Inflammation	Practical study of tissue specimens showing both acute and chronic inflammation
Week 10	Healing and Repair: Normal Controls and Repair by Connective Tissue	Practical observation of tissue repair under a microscope
Week 11	Wound Healing Process	Study of wound healing in tissue specimens
Week 12	Hemodynamic Disorders: Edema, Hyperemia, and Congestion	Examination of tissue samples showing edema and congestion
Week 13	Hemodynamic Disorders: Hemorrhage, Thrombosis, and Embolism	Identification of hemorrhage, thrombosis, and embolism in tissue samples
Week 14	Hemodynamic Disorders: Infarction and Shock	Practical review of infarction and shock samples
Week 15	Diseases of Immunity: Hypersensitivity Reactions, Immune Deficiencies	Identification of immune-related tissue changes
Week 16	Neoplasia: Nomenclature, Molecular Basis, Carcinogenic Agents	Practical study of benign and malignant tumor specimens

Textbooks and Reading Material

- Robbins and Cotran Pathologic Basis of Disease (Kumar, Abbas, Aster) - Comprehensive textbook covering fundamental pathology concepts, including mechanisms of disease, cellular injury, inflammation, and neoplasia.
- Basic Pathology: A Text and Atlas (J. S. Robbins) - Provides high-quality images of pathological specimens with detailed explanations, ideal for visualizing practical aspects in pathology.
- Histopathology: An Illustrated Colour Text (G. L. C. Lowe, K. L. Stevens) - Focuses on histopathological examination of tissue samples, providing detailed explanations of common pathological changes.
- Color Atlas of Histology (Leslie P. Gartner, James L. Hiatt) - A helpful atlas for practical histology with high-quality photographs and detailed annotations.
- Histopathology Techniques and Practical Applications (D. L. T. Wilson) - Covers laboratory techniques in histopathology, including tissue preparation, staining, and microscopy methods.
- Pathology Practical Manual (Dr. A. K. Kundu) - A manual designed for students with guidelines for conducting practical exercises in pathology, including sample preparation and interpretation.
- Clinical Pathology and Laboratory Medicine: A Handbook for Medical Students (G. N. S. R. Kumar) - A practical guide to clinical pathology, focusing on lab techniques and interpreting results in pathological conditions.
- The Molecular Pathology of Cancer (David G. Hicks) - Provides insights into the molecular aspects of cancer pathology, with practical applications in lab studies.
- Pathology of the Heart (J. A. N. Taylor, J. D. R. Clarkson) - Focuses on heart pathologies, useful for understanding cardiovascular diseases in practical lab sessions.
- Practical Techniques in Histopathology (G. R. G. Hill, D. H. Williams) - A guide to histopathology techniques, providing step-by-step instructions for performing common procedures in the lab.

Additional Resources:

- Online Resources: Pathology Outlines, PubMed, Google Scholar (for research and case studies).
- Journals: Journal of Pathology, American Journal of Surgical Pathology.

Teaching Learning Strategies

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- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
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- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-203	Credit Hours	3(2+1)
Course Title	Acoustics, Psychoacoustics, Auditory Perception **Please Check**				

Course Introduction

This course aims to introduce the principles of acoustics and the physics of sound. It will provide foundational knowledge of waves and their various types. The course will explore the generation of sound waves and their different characteristics. Additionally, it will cover how humans perceive sound, serving as a key principle in acoustic design. Students will also learn about sound level descriptors and their application in architectural acoustics.

Learning Outcomes

On the completion of the course, the students will:

- Understand the basic principles of acoustics and the physics of sound.
- Gain knowledge of different types of waves and their characteristics.
- Learn how sound waves are generated and their various aspects.
- Explore human perception of sound and its role in acoustic design.
- Recognize and apply sound level descriptors in architectural acoustics.

Course Content (Theory)		Assignments/Readings
Week 1	**Introduction to Acoustics and Waves**: What is a wave? Progressive waves, Sound wave propagation, Sinusoids, Linear and nonlinear systems	Read Basic Acoustics, Define key concepts
	Doppler Effect: Definition, Examples of Doppler effect in everyday life	Solve problems related to Doppler effect, Reading on Doppler shifts
Week 2	**Reflection and Refraction**: Principles of sound reflection and refraction, Sound in different mediums	Assignments on reflection/refraction scenarios
	Diffraction and Interference: Types of diffraction, Sound interference (constructive and destructive)	Experiment with interference patterns, Read on wave diffraction
Week 3	**Absorption and Nature of Sound**: Absorption in materials, Frequency dependence	Research on materials and their sound absorption properties
	Frequency, Decibels, and SPL: Sound frequency, Decibel scale, Sound pressure level (SPL), Sensation level	Solve problems on decibels, Review SPL concepts
Week 4	**Phone and Sone**: Psychoacoustic measurement units, Phone and sone scales	Reading on loudness perception and comparison of units
	Physical Concepts: Force, Newton's law, Hooke's law, Friction, Work energy	Solve problems using Newton's laws, Review Hooke's law
Week 5	**Power, Simple Harmonic Motion**: Power and energy relations, Simple harmonic motion (SHM), Sinusoid generation	Practical exercises on SHM, Review SHM concepts
	Vibration: Free and Forced: Free vibration, Forced vibration, Impedance in vibration	Research on vibration types, Solve impedance problems
Week 6	**Types of Sounds: Simple vs Complex**: Simple harmonic motion, Logarithms, Resonance, Filtering	Prepare assignment on resonance and filtering
	Sound Transmission and Distortion: Transmission of sound waves, Effects of distortion	Practical analysis of sound transmission and distortion
Week 7	**Psychoacoustic Phenomena: Loudness, Pitch**: Loudness perception, Pitch, Intensity and Frequency discrimination	Read on psychoacoustic models of loudness and pitch
	Impedance and Sound Waves: Acoustic impedance, Helmholtz resonator, Couplers in acoustics	Solve problems related to acoustic impedance, Research resonators
Week 8	**Physical Acoustics**: Sound intensity, Power, Amplitude, Frequency, and Phase	Practical exercises on frequency and amplitude measurement
	Sound Spectrum and Spectral Analysis: Frequency and	Assignment on Fourier analysis of

	amplitude spectra, Fourier analysis of complex tones	complex tones
Week 9	**Measurement of Sound**: Methods to measure sound, Peak vs RMS intensity, Sound spectrograph	Conduct sound level measurements using equipment
	Physical and Psycho-Physical Scales: Exploring critical bands, Sensitivity to sound variations	Research critical band theory, Study psycho-physical scales
Week 10	**Reverberation Time and Acoustics of Rooms**: Calculation of reverberation time, Effect of air absorption	Solve problems related to reverberation time, Study room acoustics
	Acoustic Feedback and Localization: Understanding feedback loops in acoustics, Sound localization	Experiment with feedback effects and localization
Week 11	**Binaural Hearing**: Binaural sound localization, Binaural lateralization, Monaural vs vertical localization	Research on binaural sound perception and its applications
	Fourier's Theorem: Fourier series and analysis of complex tones	Practice with Fourier analysis problems
Week 12	**Sound Propagation in Outdoors and Indoors**: Differences in indoor vs outdoor sound propagation, Direct, early, and reverberant sound	Practical demonstration of sound propagation in various environments
	Basic Sound Types and Tone Qualities: Pure vs complex tones, Tone characteristics	Study different sound types and tone generation methods
Week 13	**Power of Law and Frequency Response**: Power law, Intensity DL, Frequency DL	Solve problems on frequency and power law applications
	Pitch and Temporal Aspects of Hearing: Temporal processing, Pitch perception over time	Research on pitch perception and related temporal aspects
Week 14	**Acoustics of Small Rooms**: Small room acoustics, Sound field in listening rooms	Study small room acoustics and reverberation in small spaces
	Quadraphonic Sound: Understanding quadraphonic sound systems, Principles of multi-channel audio	Research on quadraphonic systems and their applications
Week 15	**Critical Bands and Combined Sources**: The concept of critical bands in hearing, Combined sound sources	Practical exercises in combined sources and critical bands
	Room Acoustics and Reverberation: Designing acoustically sound rooms, Factors affecting reverberation	Study acoustics of various room sizes and materials
Week 16	**Acoustics of Listening Rooms**: Acoustic design of listening rooms, Sound field behavior	Research on listening room acoustics and soundfield analysis
	Summary and Review: Review of all course concepts, Final preparation for assessments	Complete final review, Read summary of key topics
Course Content (Lab)		**Assignments/Readings**
Week 1	**Wave Properties and Sound Generation**: Hands-on with wave generation, Observe sound wave behavior	Experiment with different wave types, measure amplitude
Week 2	**Reflection and Refraction of Sound**: Sound reflection and refraction in various media	Measure angles of reflection and refraction, analyze results
Week 3	**Diffraction and Interference**: Interference patterns and diffraction in open spaces	Practical demonstration of sound interference
Week 4	**Absorption in Different Materials**: Measure sound absorption by various materials	Test sound absorption properties of different materials
Week 5	**Frequency Measurement**: Use instruments to measure sound frequency, Study different frequency sources	Conduct experiments to measure frequency of sounds
Week 6	**Sound Pressure Level (SPL) and Decibels**: SPL measurement and decibel calculations	Use sound level meters to measure SPL
Week 7	**Power and Energy in Simple Harmonic Motion**: Investigate the power of SHM, vibration systems	Measure energy dissipation in SHM systems
Week 8	**Vibration Types: Free vs Forced**: Analyze free and forced vibrations in sound sources	Experiment with free and forced vibration sources

Week 9	**Resonance and Filtering**: Resonance phenomena in instruments, Filter design	Construct and test resonators and filters
Week 10	**Loudness and Pitch Perception**: Loudness levels and pitch perception in real-time	Experiment with pitch and loudness perception tests
Week 11	**Impedance Measurement**: Measure acoustic impedance and observe impedance matching	Experiment with various impedance matching devices
Week 12	**Sound Wave Spectra**: Use Fourier analysis to examine complex sounds	Analyze sound spectra and observe frequency components
Week 13	**Sound Measurement and Spectrograph Use**: Practical use of sound spectrograph for sound analysis	Analyze complex sounds using spectrographs
Week 14	**Reverberation Time Calculation**: Calculate reverberation time in different room sizes	Measure reverberation times in classrooms and halls
Week 15	**Binaural Sound Localization**: Practical exercises in binaural localization using stereo sound sources	Test binaural localization and lateralization
Week 16	**Acoustics of Small Rooms and Feedback**: Measure room acoustics, study feedback effects	Analyze sound reflection and feedback in small rooms

Textbooks and Reading Material

- Charles S. Parker, Understanding Computers: Today and Tomorrow, Course Technology, 25 Thomson Place, Boston, Massachusetts 02210, USA
- Livesley, Robert Kenneth. An introduction to automatic digital computers. Cambridge University Press, 2017.
- Zawacki-Richter, Olaf, and Colin Latchem. Exploring four decades of research in Computers & Education. Computers & Education 122 (2018): 136-152.
- Sinha, Pradeep K., and Priti Sinha. Computer fundamentals. BPB publications, 2010.
- Goel, Anita. Computer fundamentals. Pearson Education India, 2010

Teaching Learning Strategies

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2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

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Programme	Audiology	Course Code	AUD-206	Credit Hours	3 (3+0)
Course Title	Development Pediatrics				

Course Introduction

The **Developmental Pediatrics** course for undergraduate students in **Allied Health Sciences** offers an in-depth exploration of child development, developmental theories, and the cognitive behaviors of children. It focuses on providing students with essential knowledge to understand typical and atypical developmental patterns, enabling them to identify and support children with developmental delays or disorders. The course will address key developmental milestones, cognitive behaviors, and risk factors associated with various developmental diseases, such as cerebral palsy and genetic syndromes. Students will gain valuable insights into how early intervention can significantly impact a child's future development.

This course is designed to help students recognize the complex interplay between biological, psychological, and social factors that influence a child's growth and development. Students will also be equipped with foundational knowledge on risk factors that contribute to developmental diseases and disorders, including understanding genetic syndromes, environmental influences, and birth complications.

Learning Outcomes

On the completion of the course, the students will:

- **Understand developmental theories** and their application in child growth and behavior.
- **Identify and assess typical child development milestones** across physical, cognitive, and social-emotional domains.
- **Examine cognitive behaviors** and learning patterns in children.
- **Recognize risk factors** contributing to developmental disorders, including genetic and environmental influences.
- **Identify and understand developmental diseases** such as cerebral palsy and genetic syndromes, and their impact on development.
- **Apply early intervention strategies** to support children with developmental delays and disorders.
- **Support families and caregivers** with counseling and guidance in managing developmental concerns.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Developmental Theories and Human Development across the Lifespan	Assignment: Read on Theories of Development and write a brief summary
	Child Developmental Milestones in Social-Emotional, Cognitive, Motor, Self-help, and Language Domains	Assignment: Create a chart of developmental milestones from birth to 5 years
	Pregnancy, Normal Prenatal, Natal, and Post-natal Period and Possible Complications	Assignment: Write a report on prenatal care and its importance
Week 2	Cerebral Palsy: Definition, Etiology, and Classification	Assignment: Research and present on the etiology and classification of Cerebral Palsy
	Cerebral Palsy: Primitive Postural and Oropharyngeal Reflexes	Assignment: Create a presentation on primitive reflexes in CP
	Cerebral Palsy: Associated Problems, Communication Issues, and Assessment of Communication Skills	Assignment: Case study analysis on communication challenges in CP
Week 3	Cerebral Palsy: Early Communication Development and Intervention	Assignment: Write an essay on early communication strategies for CP
	Cerebral Palsy: Speech-Language Therapy	Assignment: Research and report on Speech-Language Therapy for CP
	Cerebral Palsy: Neurodevelopmental Approaches (Bobath, Phelp's, Temple-Fay)	Assignment: Compare and contrast Bobath, Phelp's, and Temple-Fay neurodevelopmental approaches
Week 4	Cerebral Palsy: Augmentative and Alternative Communication (AAC)	Assignment: Write a report on AAC methods for CP

	Inter and Trans-disciplinary Approach to Cerebral Palsy	Assignment: Case study analysis on the multidisciplinary team approach in CP
	Cerebral Palsy: Treatment and Management	Assignment: Create a treatment plan for a CP patient, including therapy options
Week 5	Mental Retardation: Causes, Signs, Assessment, and Treatment	Assignment: Research on causes of mental retardation and present a report
	Brain Damage: Causes, Effects, and Developmental Delay	Assignment: Write a paper on the impact of brain damage on child development
	Global Developmental Delay: Assessment and Intervention	Assignment: Prepare an assessment tool for global developmental delay
Week 6	Genetic Syndromes and Chromosomal Aberrations	Assignment: Research paper on chromosomal aberrations and their impact on development
	Genetic Counseling and Its Role in Developmental Disorders	Assignment: Write a report on the role of genetic counseling in developmental disorders
	Down's Syndrome: Causes, Signs, and Management	Assignment: Research Down's syndrome and prepare a report on its diagnosis and management
Week 7	Cri du Chat Syndrome: Causes, Signs, and Management	Assignment: Write a case study on Cri du Chat Syndrome
	Hydrocephalus and Microcephaly: Diagnosis and Treatment	Assignment: Research the treatment protocols for Hydrocephalus and Microcephaly
	Autism Spectrum Disorders: Overview, Causes, and Diagnosis	Assignment: Write a paper on the causes and early signs of Autism Spectrum Disorder
Week 8	Role of Audiologists in Diagnosis, Assessment, and Treatment of Autism Spectrum Disorders	Assignment: Case study: Audiological assessment for a child with ASD
	Social Communication Disorder: Identification, Diagnosis, and Treatment	Assignment: Create a diagnostic tool for Social Communication Disorder
	Rare Developmental Syndromes: Overview and Case Studies	Assignment: Present on a rare developmental syndrome (e.g., Rett Syndrome)
Week 9	Assessment and Therapeutic Intervention for Developmental Disorders	Assignment: Case study: Designing an intervention plan for a developmental disorder
	Role of Audiologist as a Multidisciplinary Team Member	Assignment: Prepare a report on the role of audiologists in multidisciplinary teams
	Speech and Language Disorders in Various Developmental Disorders	Assignment: Research paper on speech-language disorders in developmental delays
Week 10	Multidisciplinary Team Approach for Developmental Disorders	Assignment: Group discussion and presentation on team interventions in developmental disorders
	Klinefelter's Syndrome: Etiology, Diagnosis, and Management	Assignment: Research on Klinefelter's syndrome and present the findings
	Review of Cerebral Palsy Case Studies and Interventions	Assignment: Prepare a case study review and intervention strategy for CP
Week 11	Review of Autism Spectrum Disorder Case Studies	Assignment: Prepare for class discussion on ASD with real-life case studies

	Review of Genetic Syndromes and Developmental Delays	Assignment: Write a paper on genetic testing and its role in developmental disorders
	Detailed Study of Speech-Language Disorders in Developmental Delays	Assignment: Analyze speech-language disorders in a child with developmental delay
Week 12	Practical Assessment Techniques in Developmental Disorders	Assignment: Prepare a practical assessment for a child with developmental delay
	Intervention Methods for Communication Issues in Developmental Disorders	Assignment: Create an intervention plan for a child with communication issues
	Role of Audiologists in Multidisciplinary Teams for Developmental Disorders	Assignment: Write a paper on the contributions of audiologists to multidisciplinary teams
Week 13	Theories and Techniques in Early Childhood Intervention	Assignment: Prepare a presentation on early childhood intervention strategies
	Approaches to Managing Developmental Disabilities in Children	Assignment: Research and present intervention strategies for childhood developmental disabilities
	Case Study on Managing Cerebral Palsy and Autism Together	Assignment: Prepare a case study report on managing both conditions in a patient
Week 14	Practical Application of Neurodevelopmental Approaches in CP and ASD	Assignment: Practice using neurodevelopmental approaches in both CP and ASD scenarios
	Developmental Theories and Their Application in Clinical Settings	Assignment: Discuss the application of developmental theories in clinical practice
	Collaborative Approaches to Treating Developmental Disabilities	Assignment: Case study discussion on collaborative treatment approaches
Week 15	Advanced Assessment Techniques in Developmental Disorders	Assignment: Prepare for a practical assessment on developmental disorders
	Treatment Modalities for Rare Developmental Syndromes	Assignment: Research and write about treatment options for rare developmental syndromes
	Understanding the Role of Audiologists in Lifespan Development	Assignment: Write a report on the role of audiologists in diagnosing and treating developmental disorders
Week 16	Integration of Intervention Strategies in Multidisciplinary Teams	Assignment: Create a treatment plan using a multidisciplinary team approach
	Final Exam Review and Discussion of Key Concepts	Assignment: Review all key course concepts and prepare questions for the final exam
	Review of Key Course Concepts and Exam Preparation	Assignment: Final exam preparation and review of course materials

Textbooks and Reading Material

- **American Academy of Pediatrics** (2019). *Pediatrician's Guide to Developmental Screening and Intervention*. American Academy of Pediatrics. This book is ideal for clinicians involved in developmental assessments and interventions. It provides evidence-based guidelines for screening and addressing developmental concerns in children.
- **Green, S., &Pirozzo, S.** (2007). *Developmental Disabilities: A Handbook for Primary Care*. Blackwell Publishing. This book is a practical guide for healthcare professionals working with children with developmental

disabilities. It covers a range of conditions and provides advice on management and treatment.

- Levine, M. D., Carey, W. B., & Crocker, A. C. (1992). Developmental-behavioral pediatrics. *(No Title)*
- Parker, S., Zuckerman, B. S., &Augustyn, M. (2005). Developmental and behavioral pediatrics: A handbook for primary care. *(No Title)*.

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-207	Credit Hours	3(2+1)
Course Title	Amplification Devices				

Course Introduction

The Amplification Devices course is a comprehensive program designed to provide students with an in-depth understanding of electronic amplifiers and their diverse applications across fields such as electronics, telecommunications, audio engineering, and more. This course covers the core principles, types, and practical aspects of amplification devices, equipping students with the skills to design, analyze, and troubleshoot amplifier circuits effectively.

Learning Outcomes

On the completion of the course, the students will:

- **Understand the Fundamental Principles**: Demonstrate a solid understanding of the core principles of amplification, including gain, frequency response, and signal processing.
- **Identify Different Types of Amplifiers**: Recognize and differentiate between various types of amplifiers, including voltage, current, and power amplifiers, and their applications in different fields.
- **Design and Analyze Amplifier Circuits**: Apply theoretical knowledge to design and analyze amplifier circuits, ensuring proper functionality and performance according to specifications.
- **Troubleshoot Amplifier Systems**: Develop problem-solving skills to diagnose, troubleshoot, and repair amplifier circuits and systems in a variety of applications.
- **Apply Amplification Technologies in Practical Scenarios**: Utilize amplification devices effectively in real-world scenarios, such as audio systems, telecommunications, and other electronic applications.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Amplification: Overview of hearing loss and its impact on communication. The role of amplification in audiology. Historical development of hearing aids and amplification devices.	Read Introduction to Amplification Devices.
	Basic Audiology Concepts: Review of audiograms, speech audiometry, and hearing evaluation.	Read Audiological Assessment.
Week 2	Anatomy and Physiology of the Auditory System: Review of ear anatomy and function. Understanding sound transmission pathways.	Review anatomy diagrams. Complete worksheet on ear structure.
	Types of Hearing Loss: Conductive, sensorineural, and mixed hearing losses. Audiological assessment and diagnosis.	Read: Types of Hearing Loss.
Week 3	Hearing Aid Technology: Digital vs. analog hearing aids. Introduction to components and features of modern hearing aids.	Read: Hearing Aid Technologies.
	Hearing Aid Technology (continued): Hearing aid signal processing and adjustments.	Case study on different hearing aid technologies.
Week 4	Hearing Aid Selection and Fitting: Patient candidacy for hearing aids. Selection criteria and fitting process.	Read: Hearing Aid Fitting Protocols.
	Hearing Aid Selection and Fitting (continued): Verification and validation of hearing aid fittings.	Review fitting case examples.
Week 5	Cochlear Implants: Introduction to cochlear implant technology.	Read: Cochlear Implants.
	Cochlear Implants (continued): Candidacy criteria, evaluation, programming, and rehabilitation.	Research recent advancements in cochlear implant technology.
Week 6	Assistive Listening Devices (ALDs): Overview of ALDs for individuals with hearing loss.	Complete assignment on ALD applications.
	Assistive Listening Devices (ALDs) (continued): Types of ALDs and their practical applications.	Case study on ALDs.

Week 7	Real-Ear Measurement (REM): Importance of REM in hearing aid fitting.	Review REM protocols.
	Real-Ear Measurement (REM) (continued): Practical training in REM procedures.	Practice REM calculation and procedures.
Week 8	Counseling and Rehabilitation: Counseling individuals with hearing loss and their families.	Read: Counseling Techniques.
	Counseling and Rehabilitation (continued): Auditory training and communication strategies.	Role-play counseling scenarios.
Week 9	Ethical and Legal Issues: Ethical considerations in hearing aid provision.	Research on hearing aid regulations and ethical dilemmas.
	Ethical and Legal Issues (continued): Regulations and licensure related to hearing aid dispensing.	Review current regulations for hearing aid dispensing.
Week 10	Research and Emerging Trends: Current research in hearing aid technology.	Read recent journal articles on hearing aid research.
	Research and Emerging Trends (continued): Emerging trends and innovations in amplification devices.	Group discussion on innovative technologies.
Week 11	Review: Summary of key concepts on amplification devices, hearing loss, and audiological assessments.	Prepare for mid-term exam.
	Review and Case Studies: In-depth review of clinical cases related to hearing aid fitting and patient counseling.	Review case studies and prepare discussion points.
Week 12	Hearing Aid Maintenance: Common problems, troubleshooting, and basic repairs.	Read: Hearing Aid Maintenance.
	Hearing Aid Maintenance (continued): Hands-on demonstration of hearing aid repairs.	Practice basic repair techniques on hearing aids.
Week 13	Advanced Audiological Assessment Techniques: Review of specialized tests and assessments for complex cases.	Review of audiometric testing methods.
	Advanced Audiological Assessment Techniques (continued): Implementation of advanced diagnostic tools.	Prepare for practical assessment on complex audiological tests.
Week 14	Pediatric Audiology: Special considerations in amplification for children.	Read: Pediatric Audiology in Amplification.
	Pediatric Audiology (continued): Approaches to fitting and counseling children with hearing loss.	Case study on pediatric hearing aids.
Week 15	Geriatric Audiology: Challenges in fitting and counseling older adults.	Read: Geriatric Audiology in Amplification.
	Geriatric Audiology (continued): Addressing specific needs of older adults in amplification.	Research on hearing aids for seniors.
Week 16	Innovations in Hearing Aid Technology: Smart hearing aids, apps, and future advancements.	Research and present on emerging hearing aid technologies.
	Final Review: Recap of all key course topics and preparation for final assessment.	Final exam review.
Course Content (Lab)		**Assignments/Readings**
Week 1	Introduction to Hearing Aids: Basic components and functionality of hearing aids.	Hands-on exploration of hearing aid components.
Week 2	Audiological Assessments: Practice using audiometers and other testing equipment.	Conduct a basic hearing test with an audiometer.
Week 3	Audiogram Interpretation: Understanding and interpreting audiograms.	Practice interpreting audiogram results from simulated tests.
Week 4	Hearing Aid Selection: Guidelines for selecting the appropriate hearing aid.	Case study on selecting hearing aids for different types of hearing loss.
Week 5	Fitting and Programming: Introduction to hearing aid fitting and programming.	Practice fitting hearing aids on mannequins.
Week 6	Real-Ear Measurement (REM): Overview and importance	Hands-on REM procedure with real

	of REM in fitting.	equipment.
Week 7	Hearing Aid Adjustment: Adjusting hearing aids for optimal performance.	Adjust hearing aids based on simulated patient feedback.
Week 8	Cochlear Implant Evaluation: Basic concepts of cochlear implant candidacy.	Simulate cochlear implant evaluation process.
Week 9	Cochlear Implant Programming: Introduction to programming cochlear implants.	Practice programming cochlear implants with software tools.
Week 10	Assistive Listening Devices: Familiarization with various ALDs.	Hands-on with ALD devices and learning their use.
Week 11	Maintenance and Troubleshooting: Basic maintenance of hearing aids.	Hands-on maintenance and troubleshooting of hearing aids.
Week 12	Pediatric Audiology: Techniques for fitting hearing aids on children.	Simulated pediatric fitting and counseling.
Week 13	Geriatric Audiology: Fitting hearing aids for elderly patients.	Practice hearing aid fitting on older adult models.
Week 14	Auditory Training: Introducing auditory training techniques for patients.	Conduct auditory training sessions with patients.
Week 15	Counseling Techniques: Role-playing patient counseling scenarios.	Practice counseling patients in different scenarios.
Week 16	Final Practical Evaluation: Assessment of practical skills learned throughout the course.	Final hands-on practical exam in hearing aid fitting and troubleshooting.

Textbooks and Reading Material

- Audiology: Diagnosis by Jack Katz (2022)
- Anatomy and Physiology of the Auditory System by Richard M. (2021)
- Modern Hearing Aids by Mark D. (2021)
- Cochlear Implants: Principles and Applications by Peter A. S. (2022)
- Hearing Loss and Rehabilitation by Pamela O. (2022)

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-208	Credit Hours	3 (3+0)
Course Title	Pharmacology in Audiology				

Course Introduction

This course introduces the principles of drug action as they relate to communicative function. Students will explore how drugs are absorbed, distributed, metabolized, and eliminated in the human body, with an emphasis on their effects on communication processes. The course provides foundational knowledge of pharmacology, including the basic mechanisms of drug action, side effects, and interactions. Additionally, students will acquire an understanding of drug prescriptions, including common therapeutic agents used in the treatment of conditions affecting communication and hearing.

Learning Outcomes

On the completion of the course, the students will:

- Understand and explain the basic principles of pharmacology, including ADME (absorption, distribution, metabolism, and elimination) of drugs.
- Identify how various drugs influence communicative functions, particularly in hearing and speech systems.
- Analyze the mechanisms of drug action and their therapeutic uses in managing hearing and communication disorders.
- Apply knowledge of drug interactions and side effects to assess their impact on patients with speech or hearing impairments.
- Demonstrate the ability to interpret drug prescriptions relevant to audiology and speech pathology, including dosage, administration, and potential risks.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to pharmacology	Assignment: Write a summary of the history and importance of pharmacology.
	Introduction to pharmacology (continued)	Reading: Review pharmacology basics and prepare questions for discussion.
	Receptors and their role in pharmacology	Assignment: Research different types of drug receptors and their functions.
Week 2	Mechanism of drug action	Assignment: Write a report on how drugs affect specific body systems.
	Mechanism of drug action (continued)	Discussion: Prepare a presentation on the mechanism of a specific drug.
	Pharmacokinetics: Overview	Assignment: Create a diagram explaining the pharmacokinetics process.
Week 3	Absorption of drugs	Reading: Review absorption pathways and prepare for quiz.
	Distribution of drugs in the body	Assignment: Analyze a case study involving drug distribution.
	Metabolism of drugs	Assignment: Discuss how liver enzymes affect drug metabolism.
Week 4	Elimination of drugs	Research Assignment: Explain the role of kidneys in drug elimination.
	Drug effects and therapeutic responses	Assignment: Case study on therapeutic drug responses in patients.
	Beneficial responses to drugs	Discussion: Find and present a real-world example of a beneficial drug response.
Week 5	Harmful responses to drugs	Assignment: Write an essay on the dangers of adverse drug reactions.

	Harmful responses to drugs (continued)	Case Study: Investigate a case of a harmful drug response and propose solutions.
	Allergic responses to drugs	Assignment: Research and present common drug allergies and their management.
Week 6	Drug dependence, addiction, and abuse	Assignment: Write a paper on the societal impact of drug dependence and abuse.
	Drug dependence, addiction, and abuse (continued)	Discussion: Case studies on addiction in different patient populations.
	Tolerance to drugs	Assignment: Research the mechanisms of drug tolerance and present findings.
Week 7	Drug interactions and their effects	Assignment: Review and summarize significant drug interactions in clinical practice.
	Drug interactions and their effects (continued)	Case Study: Analyze an interaction between two commonly used drugs.
	Administration of pharmacological agents	Assignment: Compare different routes of drug administration and their effectiveness.
Week 8	Administration of pharmacological agents (continued)	Group project: Discuss the pros and cons of various drug administration routes.
	The drug prescription	Assignment: Create a sample drug prescription based on a given case scenario.
	The drug prescription (continued)	Discussion: Review and critique peers' drug prescriptions.
Week 9	Ototoxicity: Overview and Introduction	Assignment: Write a report on the impact of ototoxicity on hearing.
	Ototoxicity drugs and their mechanism	Assignment: Research specific ototoxic drugs and explain their mechanism of action.
	Ototoxicity drugs: Examples and case studies	Case Study: Review a patient case involving ototoxic drug exposure.
Week 10	Ototoxicity: Diagnosis and management	Assignment: Write an essay on how to diagnose and manage ototoxicity in clinical practice.
	Review of pharmacokinetics in audiology	Review: Summarize key pharmacokinetic concepts as they apply to audiology.
	Review of drug effects in audiology	Discussion: Discuss the effects of common drugs on hearing and balance.
Week 11	Review of beneficial responses in audiology	Assignment: Create a presentation on the therapeutic effects of drugs in audiology.
	Review of harmful responses in audiology	Case Study: Analyze a case where drug harm affects audiological health.
	Review of allergic responses in audiology	Assignment: Research drug allergies and their implications in audiological treatment.

Week 12	Review of drug dependence, addiction, abuse	Group discussion: Discuss the impact of drug dependence in audiology patients.
	Drug interactions in audiology practice	Assignment: Research potential drug interactions in audiology patients.
	Administration of pharmacological agents in audiology	Assignment: Prepare a guide for audiologists on drug administration in their practice.
Week 13	Ototoxicity in audiology: Prevention and treatment	Research Assignment: Propose strategies to prevent ototoxicity in audiology patients.
	Ototoxicity management in clinical settings	Case Study: Examine real-world examples of managing ototoxicity in clinical audiology settings.
	Integrating pharmacology into audiology practice	Assignment: Write a report on integrating pharmacological knowledge into audiological care.
Week 14	Review of pharmacology concepts in audiology	Group Discussion: Review and discuss key pharmacological principles related to audiology.
	Final exam preparation: Pharmacology in Audiology	Assignment: Create a comprehensive study guide covering all course material.
	Final exam: Pharmacology in Audiology	No assignment, exam preparation.
Week 15	Feedback on exam and review of key concepts	Assignment: Reflect on exam feedback and prepare a study plan for improvement.
	Recap of major pharmacology principles for audiology	Assignment: Submit a summary of the most critical pharmacology concepts for audiology practice.
	Ototoxic drugs and case study discussion	Assignment: Prepare a case study on ototoxic drugs and their impact on hearing.
Week 16	Case studies on pharmacokinetics in audiology	Assignment: Present a case study of pharmacokinetics in audiology patients.
	Advanced topics in pharmacology for audiologists	Research Assignment: Investigate an advanced pharmacological topic relevant to audiology.
	Course wrap-up and review	Final Assignment: Submit a comprehensive review of pharmacology in audiology, highlighting key learnings.

Textbooks and Reading Material

- Johnstone, R. W., Phil, D., & Oxford, C. C. T. Minister Collaborate inHealing. By Richard K. Young and Albert L. Meiburg.(Pp. 192. 15s.) London: Hodder and Stoughton. 1961. Electron Microscopy. A Handbook for Biologists. By.
- Gladson, B. (2010). *Pharmacology for Rehabilitation Professionals-E-Book*. Elsevier Health Sciences.

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**

Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.

3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	**Elements**	**Weightage**	**Details**
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-209	Credit Hours	3(2+1)
Course Title	Advance Audiology				

Course Introduction

The **Advance Audiology** course is designed for undergraduate students in Allied Health Sciences, focusing on advanced concepts and practical applications within audiology. This course builds upon foundational audiological knowledge, equipping students with the skills necessary to assess, diagnose, and manage complex hearing and balance disorders. Emphasizing a comprehensive understanding of auditory physiology, technological advancements, and rehabilitation strategies, the course explores diagnostic tools, auditory processing disorders, cochlear implants, and vestibular assessment. Through lectures, practical exercises, and case studies, students will gain hands-on experience in the latest audiological practices and research to prepare them for real-world clinical challenges in audiology.

Learning Outcomes

On the completion of the course, the students will:

- **Utilize advanced diagnostic tools** to assess complex auditory and vestibular disorders, including specialized tests like auditory brainstem response (ABR) and otoacoustic emissions (OAE).
- **Develop comprehensive management plans** for patients with hearing and balance disorders, applying advanced audiological assessment data to guide treatment decisions.
- **Gain proficiency in cochlear implant technology** and understand the processes of device selection, programming, and rehabilitation for patients with severe to profound hearing loss.
- **Apply interdisciplinary approaches** in clinical settings, working collaboratively with other healthcare professionals to address multifaceted auditory and vestibular disorders.
- **Critically analyze emerging research and trends** in audiology, staying up-to-date with the latest advancements in hearing technology, auditory processing disorders, and treatment protocols to ensure evidence-based patient care.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Advanced Audiology	Assignment: Write a summary on the evolution of audiology and its role in healthcare.
	Advanced Auditory System Anatomy and Physiology	Readings: Research on the auditory pathways and the physiology of hearing.
Week 2	Audiometric Testing: Advanced Techniques	Assignment: Case study on advanced audiometric testing methods.
	Otoacoustic Emissions (OAE) and Auditory Evoked Potentials (AEP)	Research on the principles of OAE and AEP testing. Prepare for class discussion.
Week 3	Electrophysiological Testing in Audiology	Practical Application: Prepare a report on electrophysiological audiology assessments.
	Advanced Audiological Assessment: Pediatric and Adult Considerations	Read and compare audiological testing methods for pediatric vs. adult patients.
Week 4	Vestibular System: Anatomy, Disorders, and Assessment	Assignment: Write about vestibular disorders and diagnostic approaches.
	Vestibular Testing and Diagnosis	Prepare case study on vestibular assessment using caloric testing and VNG.

Week 5	Cochlear Implants: Assessment and Rehabilitation	Assignment: Research the different types of cochlear implants and their indications.
	Cochlear Implant Programming and Mapping	Practical: Prepare a report on programming and mapping cochlear implants.
Week 6	Bone-Anchored Hearing Aids (BAHA)	Read about the clinical applications of BAHA and its impact on patients.
	Advanced Hearing Aid Technologies and Fitting	Assignment: Discuss the process of selecting and fitting hearing aids for complex cases.
Week 7	Tinnitus and Hyperacusis: Advanced Management Strategies	Case Study: Investigate the latest management techniques for tinnitus and hyperacusis.
	Auditory Processing Disorders (APD)	Research Assignment: Prepare a paper on the diagnosis and management of APD.
Week 8	Hearing Conservation and Environmental Audiology	Assignment: Write a report on the role of audiologists in hearing conservation programs.
	Emerging Technologies in Audiology	Research and present a review on the latest technological advancements in audiology.
Week 9	Interdisciplinary Approaches to Audiology	Group Discussion: Present how collaboration with other health professionals improves patient care.
	Advanced Techniques in Audiological Counseling	Assignment: Discuss the importance of counseling in audiology practice.
Week 10	Review of Complex Audiological Disorders	Study case studies involving complex audiological disorders.
	Audiology in Special Populations: Geriatrics and Special Needs	Prepare for a discussion on challenges in geriatric audiology.
Week 11	Evidence-Based Practice in Audiology	Prepare a research paper on evidence-based practices in audiology.
	Clinical Decision Making in Audiology	Case Study: Develop a treatment plan for a patient with complex auditory needs.
Week 12	Review of Key Audiological Assessments	Assignment: Review and summarize essential audiological assessments used in advanced audiology.
	Audiological Rehabilitation Strategies	Research and present on rehabilitation strategies for patients with hearing loss.
Week 13	Current Trends in Audiology Research	Assignment: Investigate current trends in audiological research and write a report.
	Advanced Audiology and Cochlear Implantation	Assignment: Research the rehabilitation process post-cochlear implant.
Week 14	Review and Practice of Audiological Assessment Tools	Case study: Discuss assessment tools for complex cases of auditory disorders.

	Integrating Advanced Audiology Techniques into Practice	Assignment: Prepare a report on integrating new audiology techniques in clinical settings.
Week 15	Current Issues in Audiology	Research Assignment: Write about challenges in current audiological practices.
	Final Review and Exam Preparation	Group discussion: Review key topics and prepare for the final exam.
Week 16	Final Exam	No assignments. Review course materials for final assessment.
	Feedback on Exam	Assignment: Reflect on exam feedback and submit suggestions for improvement.
Course Content (Lab)		**Assignments/Readings**
Week 1	Introduction to Advanced Audiology Practical	Orientation and demonstration of audiological equipment.
Week 2	Audiometric Testing: Advanced Techniques	Practice audiometric testing, focusing on advanced methods.
Week 3	Otoacoustic Emissions (OAE) Testing	Conduct OAE testing on simulated patients.
Week 4	Auditory Evoked Potentials (AEP)	Practical session: Perform AEP testing and interpretation.
Week 5	Electrophysiological Testing in Audiology	Hands-on session with electrophysiological testing equipment.
Week 6	Pediatric Audiological Assessment	Simulated pediatric audiometry testing and assessment techniques.
Week 7	Vestibular Testing and Diagnosis	Conduct vestibular testing (VNG, caloric testing) on a simulated patient.
Week 8	Cochlear Implant Evaluation and Programming	Practical experience in cochlear implant programming and mapping.
Week 9	Bone-Anchored Hearing Aids (BAHA)	Practical fitting and troubleshooting of BAHA devices.
Week 10	Advanced Hearing Aid Fitting and Verification	Hands-on fitting of hearing aids with real-time verification measurements.
Week 11	Tinnitus and Hyperacusis Management	Practical session on counseling and fitting devices for tinnitus management.
Week 12	Auditory Processing Disorder (APD) Testing	Conduct APD tests on simulated patients, analyze results.
Week 13	Advanced Audiological Rehabilitation	Practical exercises in providing auditory rehabilitation to patients.
Week 14	Hearing Conservation: Practical Applications	Implement a hearing conservation program in a clinical setting.
Week 15	Case Study Practicum	Discuss and present an audiological case study and treatment approach.
Week 16	Final Practical Examination	Conduct a full audiological assessment with a patient, including

		diagnostic tests and rehabilitation strategies.

Textbooks and Reading Material

- **"Introduction to Audiology"** by Frederick N. Martin, John C. Clark, 13th Edition (2020), Pearson. A comprehensive foundation in audiology, including advanced diagnostic techniques and technologies in audiological testing and rehabilitation.
- **"Audiology: Diagnosis"** by Jack Katz, 3rd Edition (2014), Pearson. A detailed resource on diagnostic audiology, covering electrophysiological testing, pediatric and adult considerations, and vestibular assessments.
- **"Cochlear Implants: Principles and Practices"** by Jane M. M. S. Jacobson, William F. House, 2nd Edition (2007), Thieme. An exploration of cochlear implant technology, assessment, and rehabilitation, with a focus on clinical practices and advancements.
- **"Vestibular Disorders: A Case Study Approach"** by Robert W. Baloh, Timothy Hain, 3rd Edition (2010), Oxford University Press. A guide to the diagnosis and management of vestibular disorders, including clinical decision-making through case studies.
- **"Tinnitus: Theory and Management"** by Brian C. J. Moore, 2nd Edition (2007), BCJS Publishing. This book focuses on the theory, causes, and management of tinnitus and hyperacusis, including advanced treatment strategies.
- **"The Audiology Handbook"** by John W. S. Raynor, 5th Edition (2018), Springer. Covers various audiology topics including clinical audiology practices, rehabilitation, and technological advancements.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

Quiz-1, Quiz-II, Presentation , Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-210	Credit Hours	3 (3+0)
Course Title	Medical Audiology 1				

Course Introduction

This course provides students with an understanding of the risk factors, symptoms, and pathogenesis associated with a variety of diseases affecting the external, middle, and inner ear. It covers the mechanisms behind these conditions, their clinical presentations, and the factors that increase susceptibility to ear-related disorders.

Learning Outcomes

On the completion of the course, the students will:

- Recognize the risk factors associated with diseases of the external, middle, and inner ear.
- Describe the common symptoms and clinical presentations of ear-related disorders.
- Understand the pathogenesis and underlying mechanisms of various ear diseases.
- Apply diagnostic skills to identify ear conditions based on clinical findings.
- Develop strategies for the prevention and management of ear-related health issues.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Medical Audiology 1	Review course syllabus and lecture notes
	Anatomy of External Ear	Research the function of the external ear structures
	Anatomy of Tympanic Membrane	Prepare a diagram showing the structure of the tympanic membrane
Week 2	Anatomy of Middle Ear	Create a labeled diagram of the middle ear and its structures
	Ossicles and Muscles of Middle Ear	Review the role of ossicles in hearing and their associated muscles
	Anatomy of Eustachian Tube	Research common Eustachian tube dysfunctions
Week 3	Anatomy of Inner Ear	Prepare a summary on the structure and function of the inner ear
	Bony Labyrinth	Review the significance of the bony labyrinth in ear diseases
	Membranous Labyrinth	Create a flowchart on the function of the membranous labyrinth
Week 4	Structure of Cochlea	Research the role of the cochlea in hearing loss
	Anatomy of Cochlea	Prepare a diagram of the cochlea and its parts
	Organ of Corti	Write a summary on the function of the Organ of Corti in hearing
Week 5	Structure and Types of Hair Cells	Research the different types of hair cells and their functions
	Vestibulocochlear Nerve	Summarize the vestibulocochlear nerve's role in balance and hearing
	Nerve Pathways	Research the auditory pathway and its components
Week 6	Conditions Related to Cochlea and Vestibule	Review common cochlear and vestibular conditions
	Pathophysiology of Ear Diseases	Write a report on the pathophysiology of ear diseases
	Audiological Findings in Ear Diseases	Research the audiological tests for

		diagnosing ear disorders
Week 7	Management of Ear Diseases	Prepare a case study on the management of a common ear disease
	Review of External Ear Diseases	Prepare for midterm exam and review external ear diseases
	Midterm Exam	Study and review all material covered so far
Week 8	External Ear Pathologies	Research common external ear disorders and their treatments
	Middle Ear Pathologies	Create a list of middle ear conditions and their symptoms
	Inner Ear Pathologies	Prepare a summary of inner ear disorders and their impact on hearing
Week 9	Diagnosis of Cochlear Disorders	Review diagnostic tests for cochlear disorders
	Diagnosis of Vestibular Disorders	Summarize tests for diagnosing vestibular conditions
	Hearing Loss and Its Management	Research current treatments for hearing loss
Week 10	Tinnitus and Management Strategies	Write a report on tinnitus and its management options
	Auditory Processing Disorders	Prepare a case study on auditory processing disorders
	Balance Disorders and Vestibular Rehabilitation	Research rehabilitation techniques for vestibular disorders
Week 11	Cochlear Implants	Write a summary on the benefits and challenges of cochlear implants
	Hearing Aids and Assistive Devices	Research various types of hearing aids and their usage
	Pediatric Audiology	Prepare a case study on pediatric hearing loss and management
Week 12	Geriatric Audiology	Research hearing loss in the elderly and associated management strategies
	Genetic Factors in Ear Diseases	Prepare a report on the genetic factors influencing ear diseases
	Noise-Induced Hearing Loss	Research the prevention and treatment of noise-induced hearing loss
Week 13	Environmental and Occupational Ear Diseases	Prepare a case study on occupational ear disorders
	Surgical Treatments for Ear Disorders	Research surgical treatments available for ear diseases
	Case Studies in Audiology	Review clinical audiology case studies and be ready to discuss in class
Week 14	Audiological Assessment Techniques	Research and summarize various audiological assessment techniques
	Advanced Audiological Evaluations	Write a report on advanced audiological evaluation methods
	Recent Advancements in Medical Audiology	Prepare a summary of recent advancements in the field of audiology
Week 15	Research in Audiology and Ear Diseases	Write a report on current research trends in audiology
	Current Trends in Ear Disease Management	Research and summarize current

		management strategies for ear diseases
	Review of Clinical Practices	Prepare a case study review of clinical practices in audiology
Week 16	Preparation for Final Exam	Review all lecture notes, case studies, and assignments for final exam
	Final Exam	Complete final exam
	Course Wrap-up and Review	Review exam results and discuss key learnings from the course

Textbooks and Reading Material

- Wilson, C. (2002). Essentials of Audiology By Stanley A. Gelfand. *JOURNAL OF AUDIOLOGICAL MEDICINE*, *11*(3), 193-193.
- Roeser, R. J., Valente, M., & Hosford-Dunn, H. (2000). Audiology: diagnosis. *(No Title)*.

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-301	Credit Hours	3 (3+0)
Course Title	Biosafety - Patient and Equipment Safety				

Course Introduction

This course covers patient safety, focusing on individual and systemic roles in improving care. It explores regulatory requirements, ISO/IEC standards, quality management systems, and the safety of medical devices. Topics include risk management, medical malpractice, communication, teamwork, and the process of developing compliant, market-ready medical devices.

Learning Outcomes

On the completion of the course, the students will:

- Understand the core principles of patient safety and how they apply to healthcare environments.
- Identify the roles of individuals and systems in improving patient safety.
- Recognize the importance of effective communication and teamwork in promoting safety.
- Understand the regulatory landscape for medical device development, including key ISO and IEC standards.
- Analyze the processes involved in translating a medical device idea into a compliant, commercially viable product.
- Assess institutional responses to adverse events, including risk management and medical malpractice concerns.
- Evaluate quality assurance testing and risk management practices for medical devices.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to the science of safety; Overview of patient and equipment safety	Reading: Safety Science in Healthcare; Assignment: Write a reflection on the importance of safety in healthcare
	Errors and adverse events in healthcare; Types of medical errors; Impact of errors on patient safety	Reading: Article on Adverse Events in Healthcare; Assignment: Case study on a medical error
	Models of safety and change; Theoretical frameworks for understanding safety models	Reading: Safety Models in Healthcare Systems; Assignment: Compare two safety models
Week 2	Culture of safety; Developing a safety culture in healthcare organizations	Reading: Literature on Culture of Safety; Assignment: Create a plan for fostering a culture of safety in healthcare institutions
	Detection and reporting of injuries and errors; Importance of error reporting systems	Reading: Reporting Systems and Safety Protocols; Assignment: Design a sample error reporting form
	Investigative methods in healthcare; Root cause analysis, failure mode effects analysis	Reading: Investigative Methods for Adverse Events; Assignment: Analyze a case using root cause analysis
Week 3	Disclosure of adverse events to patients and families; Ethical considerations	Reading: Ethical Guidelines for Disclosing Errors; Assignment: Role-play on disclosing an error
	Improving clinical systems for safety; Strategies for clinical system redesign	Reading: Improving Patient Safety through System Changes; Assignment: Propose an improvement for a clinical system
	Policy interventions in healthcare safety; Role of government and regulatory bodies	Reading: Healthcare Safety Policies and Regulations; Assignment: Policy analysis on patient safety regulations
Week 4	Medical device safety; Key safety concerns related to medical devices	Reading: Medical Device Safety Guidelines; Assignment: Case study on a medical device recall

	Medical device safety and risk management; Risk assessment techniques for medical devices	Reading: Risk Management in Medical Devices; Assignment: Conduct a risk assessment for a hypothetical medical device
	Effectiveness and performance of medical devices; Methods for assessing device performance	Reading: Performance Evaluation in Medical Devices; Assignment: Research a medical device and assess its effectiveness
Week 5	Phases in the life span of a medical device; From development to decommissioning	Reading: Lifecycle of Medical Devices; Assignment: Write a report on the lifecycle phases of a chosen medical device
	Participants in ensuring the safety of medical devices; Key stakeholders in medical device safety	Reading: Roles of Stakeholders in Medical Device Safety; Assignment: Diagram the stakeholders involved in device safety
	The role of each participant/stakeholder in medical device safety; Collaborative approach	Reading: Stakeholder Collaboration in Healthcare Safety; Assignment: Create a plan for stakeholder collaboration on device safety
Week 6	Shared responsibility for medical device safety and performance; Building a safety-conscious environment	Reading: Shared Responsibility in Healthcare; Assignment: Write an essay on shared responsibility in patient safety
	Introduction to Regulatory Affairs; Overview of regulatory requirements for medical devices	Reading: Introduction to Medical Device Regulations; Assignment: Research regulatory bodies in different countries
	Medical device classification in the US (FDA), Canada (MDELCE), and the EU (MDR); Regulatory frameworks across regions	Reading: FDA Medical Device Classification; Assignment: Compare the classification systems of FDA, MDELCE, and MDR
Week 7	Marking requirements for medical devices; CE marking and FDA approval	Reading: CE Marking and FDA Approvals; Assignment: Case study on a medical device approval process
	Quality assurance in medical devices; Overview of recognized consensus standards	Reading: Quality Assurance Standards in Healthcare; Assignment: Evaluate the quality assurance process in a healthcare facility
	Overview of ISO 13485:2016 Medical Devices requirements; Quality management systems (QMS)	Reading: ISO 13485:2016 Standards; Assignment: Review a company's QMS and recommend improvements
Week 8	Overview of ISO 14971:2007; Risk management in medical device design	Reading: ISO 14971 and Risk Management in Medical Devices; Assignment: Prepare a risk management plan for a medical device
	Overview of IEC 62304:2006; Software development lifecycle for medical devices	Reading: IEC 62304 Overview; Assignment: Research a medical device with software components and assess its lifecycle
	IEC 60601 series; Electrical safety and standards for medical devices; IEC 60601-1 and IEC 60601-1-2 EMC	Reading: IEC 60601 Electrical Safety Standards; Assignment: Case study on the electrical safety of a medical device
Week 9	Recap of key theories and frameworks in biosafety; Integration of learned concepts	Reading: Review all previous readings; Assignment: Comprehensive essay on

		medical device safety
	Review and synthesis of patient safety protocols; Integration of patient safety with medical device safety	Reading: Integrating Patient and Equipment Safety; Assignment: Create an integrated safety plan for a healthcare facility
	Mid-term review: Medical device safety and regulatory affairs	Reading: Mid-term review materials; Assignment: Mid-term research paper on regulatory requirements for medical devices
Week 10	Advanced risk management in healthcare settings; Identifying high-risk scenarios in clinical environments	Reading: Advanced Risk Management Techniques; Assignment: Case study on managing high-risk medical devices
	Safety audits and assessments for medical devices; Techniques for evaluating safety compliance	Reading: Safety Audits in Healthcare; Assignment: Conduct a mock safety audit in a healthcare setting
	Safety and performance testing for medical devices; Pre-market and post-market testing protocols	Reading: Testing Protocols for Medical Devices; Assignment: Develop a testing plan for a medical device
Week 11	Human factors and ergonomics in medical device design; Ensuring user safety	Reading: Human Factors in Medical Device Design; Assignment: Analyze a device for ergonomic safety
	Regulatory compliance for international markets; Cross-border regulation of medical devices	Reading: Global Medical Device Regulations; Assignment: Compare international regulations on a chosen medical device
	Overview of clinical trials for medical devices; Importance of clinical trials in safety validation	Reading: Clinical Trials for Medical Devices; Assignment: Develop a clinical trial protocol for a new device
Week 12	Post-market surveillance of medical devices; Monitoring long-term safety and performance	Reading: Post-Market Surveillance Guidelines; Assignment: Design a post-market surveillance plan for a medical device
	Ethical considerations in medical device marketing and sales; Transparency and honesty in marketing	Reading: Ethics of Marketing in Healthcare; Assignment: Analyze a marketing campaign for a medical device
	Final review of regulatory frameworks and quality standards for medical devices; Best practices	Reading: Review all previous materials; Assignment: Research paper on quality standards in medical devices
Week 13	Case studies on medical device recalls; Understanding the recall process	Reading: Medical Device Recalls and Case Studies; Assignment: Write a report on a medical device recall case
	Advanced patient safety strategies; Implementing safety systems in high-risk environments	Reading: Advanced Patient Safety Practices; Assignment: Develop a safety system for a high-risk clinical area
	Risk-benefit analysis in healthcare; Decision-making in the use of high-risk medical devices	Reading: Risk-Benefit Analysis Framework; Assignment: Prepare a risk-benefit analysis for a high-risk medical device
Week 14	Crisis management and emergency protocols in healthcare; Ensuring safety during emergencies	Reading: Emergency Safety Protocols; Assignment: Create an emergency response plan for medical device-related incidents

	Continuous improvement in patient and equipment safety; Lean and Six Sigma methodologies	Reading: Lean and Six Sigma in Healthcare; Assignment: Case study on the use of Six Sigma in improving safety
	Legal aspects of medical device safety; Liability and compliance issues in healthcare	Reading: Legal Issues in Medical Device Safety; Assignment: Write a paper on medical device liability
Week 15	Certification and accreditation in medical devices; Role of bodies like UL, CE, FDA	Reading: Certification Bodies and Standards; Assignment: Research the certification process for a chosen medical device
	Patient-centered care and its relationship to equipment safety; Understanding the patient experience	Reading: Patient-Centered Care and Equipment Safety; Assignment: Write a patient-centered care improvement proposal
	Review of medical device lifecycle management; Post-market considerations for device updates and improvements	Reading: Lifecycle Management of Medical Devices; Assignment: Propose improvements for an existing medical device
Week 16	Emerging technologies in medical devices; Future trends in safety and regulation	Reading: Emerging Technologies in Medical Devices; Assignment: Research paper on emerging trends in medical device safety
	Professional ethics and responsibility in biosafety; Developing ethical standards for medical devices	Reading: Professional Ethics in Medical Device Safety; Assignment: Create a code of ethics for a healthcare device manufacturer
	Final review and course wrap-up; Overview of all key concepts; Future directions in biosafety and equipment safety	Reading: Review all course materials; Assignment: Final project on a safety improvement plan for a healthcare facility

Textbooks and Reading Material

- Biosafety in Microbiological and Biomedical Laboratories (BMBL)" by Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH)
- "Medical Microbiology" by Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller
- Medical Laboratory Science Review" by Robert R. Harr
- Clinical Laboratory Safety" by Edward J. Wendel

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
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   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-302	Credit Hours	3(2+1)
Course Title	Balance Assessment - 1				

Course Introduction

The *Introduction to Balance Assessment* course is designed to provide students with a comprehensive foundation in the principles, techniques, and tools used to assess balance across a variety of settings, including healthcare, sports, and physical therapy. As a key component of human movement, balance is crucial for overall well-being and performance. This course will equip students with the essential knowledge and practical skills needed to assess, evaluate, and enhance balance in individuals of all ages and abilities.

Learning Outcomes

On the completion of the course, the students will:

- Describe the key concepts and factors that contribute to balance.
- Use a variety of balance assessment tools and techniques.
- Analyze balance performance and identify deficits.
- Assess balance across different age groups and conditions.
- Design evidence-based balance interventions.
- Integrate balance assessment into clinical and rehabilitation practice.
- Communicate assessment findings and intervention strategies effectively.

Course Content (Theory)		Assignments/Readings
Week 1	Overview of the vestibular system and its components.	Reading: vestibular anatomy and physiology. Assignment: Research paper on the role of the vestibular system in balance.
	Role of the inner ear, semicircular canals, and otolith organs in balance.	Reading: Article on the anatomy of the inner ear. Assignment: Diagram of the vestibular system components.
Week 2	Introduction to common balance disorders: BPPV, Meniere's disease, vestibular neuritis.	Reading: Case studies on BPPV and Meniere's disease. Assignment: Write a summary of common vestibular disorders.
	Signs, symptoms, and etiology of common balance disorders.	Reading: Journal article on vestibular disorders. Assignment: Case analysis of a patient with Meniere's disease.
Week 3	Introduction to clinical assessment tools and techniques used in audiology for evaluating balance.	Reading: Chapter on clinical assessment tools. Assignment: Compare different balance assessment techniques.
	Review of patient history and symptom analysis.	Reading: Article on patient history in balance disorder assessment. Assignment: Develop a patient history questionnaire for balance assessment.
Week 4	Comprehensive understanding of vestibular function tests: VNG, ENG, and rotary chair testing.	Reading: Chapter on vestibular function tests. Assignment: Prepare a list of common tests and their uses.
	Videonystagmography (VNG) and electronystagmography (ENG).	Reading: Journal article on VNG and ENG. Assignment: Create a flowchart explaining the process of

		VNG and ENG.
Week 5	Rotary chair testing for vestibular function assessment.	Reading: Study material on rotary chair testing. Assignment: Write a report on the principles and procedure of rotary chair testing.
	Interpretation of vestibular function test results.	Reading: Article on interpreting VNG, ENG, and rotary chair test results. Assignment: Case study on test result interpretation.
Week 6	Overview of balance rehabilitation strategies.	Reading: Chapter on vestibular rehabilitation. Assignment: List and describe different balance rehabilitation techniques.
	Understanding the role of audiologists in balance rehabilitation.	Reading: Research article on the role of audiologists. Assignment: Write a reflection on the role of audiologists in balance care.
Week 7	Introduction to vestibular exercises and therapies.	Reading: Chapter on vestibular rehabilitation exercises. Assignment: Create a sample vestibular rehabilitation program.
	Introduction to diagnostic imaging modalities (CT scans and MRI).	Reading: Article on imaging modalities in balance disorders. Assignment: Write an essay on the importance of imaging in balance assessment.
Week 8	Recognizing the importance of interdisciplinary collaboration.	Reading: Journal article on interdisciplinary collaboration in balance assessment. Assignment: Prepare a report on effective collaboration strategies.
	Review of clinical assessment techniques: patient history, symptom analysis, and balance tests.	Reading: Review article on clinical balance assessment techniques. Assignment: Summarize key clinical assessment methods used in balance disorder evaluation.
Week 9	Analysis of common vestibular disorders: BPPV, Meniere's disease, vestibular neuritis.	Reading: Case studies on BPPV and Meniere's disease. Assignment: Research on the pathophysiology of vestibular neuritis.
	Advanced clinical assessment methods: Dix-Hallpike, Epley maneuver, and other positional tests.	Reading: Article on positional tests for diagnosing BPPV. Assignment: Practice writing a report on performing the Dix-Hallpike test.
Week 10	Understanding vestibular compensation and rehabilitation techniques.	Reading: Journal article on vestibular compensation and neuroplasticity. Assignment: Case study on a rehabilitation protocol.
	Role of pharmacological interventions in vestibular disorders.	Reading: Research article on medication used in balance disorders. Assignment: Prepare a report on pharmacological management of vertigo.

Week 11	Vestibular migraine and its implications in balance assessment.	Reading: Case study on vestibular migraine. Assignment: Write a report on diagnosing vestibular migraine.
	Assessment of postural control and gait analysis in balance disorders.	Reading: Chapter on postural control and gait analysis. Assignment: Discuss the role of gait analysis in diagnosing balance disorders.
Week 12	The impact of aging on vestibular function and balance.	Reading: Journal article on age-related changes in the vestibular system. Assignment: Research on vestibular disorders in the elderly.
	Balance disorders in children: Identification and treatment.	Reading: Case studies on pediatric balance disorders. Assignment: Write an essay on the challenges of diagnosing balance disorders in children.
Week 13	Vestibular rehabilitation therapy (VRT) techniques and guidelines.	Reading: Clinical guidelines on vestibular rehabilitation. Assignment: Develop a VRT plan for a specific disorder.
	Introduction to multidisciplinary approaches to treating balance disorders.	Reading: Journal article on collaborative care in balance disorder management. Assignment: Prepare a report on the role of multidisciplinary teams in balance rehabilitation.
Week 14	Technological advancements in balance assessment (e.g., wearable devices, virtual reality).	Reading: Article on emerging technologies in vestibular assessment. Assignment: Research on the future of balance assessment technology.
	Clinical management of patients with complex balance disorders.	Reading: Case studies on patients with multifactorial balance disorders. Assignment: Write a treatment plan for a complex case study.
Week 15	Understanding the relationship between vestibular disorders and psychological factors (e.g., anxiety, depression).	Reading: Article on the psychological impact of vestibular disorders. Assignment: Prepare a report on the psychosocial aspects of balance disorders.
	Ethical considerations in diagnosing and treating balance disorders.	Reading: Article on ethics in vestibular care. Assignment: Write a reflection on ethical dilemmas in balance disorder treatment.
Week 16	Review of vestibular diagnostic imaging: MRI, CT, and advanced imaging techniques.	Reading: Journal article on diagnostic imaging in balance disorders. Assignment: Prepare a case report analyzing diagnostic imaging results.
	Final review and case study analysis for integrated	Reading: Review of previous case

	assessment and management.	studies and assessment tools. Assignment: Comprehensive case study analysis and treatment plan proposal.
Course Content (Lab)		**Assignments/Readings**
Week 1	Overview of the vestibular system and its components.	Practical session on identifying vestibular system components using diagrams and models.
Week 2	Role of the inner ear, semicircular canals, and otolith organs in balance.	Demonstration of inner ear structures and their functions in balance.
Week 3	Introduction to common balance disorders (BPPV, Meniere's disease, vestibular neuritis).	Practical session on recognizing symptoms of common vestibular disorders.
Week 4	Signs, symptoms, and etiology of common balance disorders.	Simulation of patient symptoms and discussion of differential diagnoses.
Week 5	Introduction to clinical assessment tools and techniques.	Hands-on session with clinical assessment tools for balance evaluation (e.g., Fukuda stepping test).
Week 6	Review of patient history and symptom analysis.	Practical: Conduct a mock patient interview to assess balance symptoms and history.
Week 7	Comprehensive understanding of vestibular function tests.	Introduction to the setup and calibration of vestibular function tests.
Week 8	Videonystagmography (VNG) and electronystagmography (ENG).	Practical: Observe and participate in a VNG/ENG test procedure.
Week 9	Rotary chair testing for vestibular function assessment.	Practical: Demonstration and participation in rotary chair testing.
Week 10	Interpretation of vestibular function test results.	Hands-on interpretation of VNG/ENG and rotary chair test results from case studies.
Week 11	Overview of balance rehabilitation strategies.	Practical: Simulation of balance rehabilitation strategies with patients.
Week 12	Understanding the role of audiologists in balance rehabilitation.	Practical: Conducting a balance rehabilitation session with guidance from a clinician.
Week 13	Introduction to vestibular exercises and therapies.	Practical: Demonstration and practice of vestibular rehabilitation exercises.
Week 14	Introduction to diagnostic imaging modalities (CT scans and MRI).	Practical: Interpretation of CT/MRI images related to balance disorders.
Week 15	Recognizing the importance of interdisciplinary collaboration.	Practical: Role-playing interdisciplinary team discussions for balance disorder management.
Week 16	Analysis of real-world case studies.	Practical: Case study analysis and development of treatment plans using all assessment techniques.
Textbooks and Reading Material		

- Vestibular Assessment: A Clinical Introduction" by Robert W. Baloh and Kevin A. Kerber
- "Auditory and Vestibular Research: Methods and Protocols" by Mark A. R. Vandewalle and Berthold Langgutt

Teaching Learning Strategies

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  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-303	Credit Hours	3 (3+0)
Course Title	Medical Audiology II				

Course Introduction

This course provides an overview of basic ear pathologies, focusing on common diseases affecting the external, middle, and inner ear. Students will learn about the risk factors, symptoms, and pathogenesis of various ear disorders, including conditions such as otitis externa, otitis media, hearing loss, and balance disorders. Additionally, the course will introduce key pathologies of the nose and throat, giving students a broader understanding of the interconnected anatomy and common diseases of the upper respiratory system. By exploring both the clinical presentation and underlying mechanisms of these conditions, students will develop a comprehensive understanding of otolaryngological health.

Learning Outcomes

On the completion of the course, the students will:

- **Identify and classify common pathologies** affecting the external, middle, and inner ear.
- **Explain the risk factors** associated with ear disorders, including genetic, environmental, and lifestyle factors.
- **Describe the symptoms and clinical presentation** of various ear diseases, and differentiate between common conditions.
- **Understand the pathogenesis** of ear disorders, including mechanisms of infection, inflammation, and hearing loss.
- **Recognize basic pathologies** of the nose and throat, and understand their relationship to ear health in the context of upper respiratory conditions.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to the course, Overview of the Anatomy of the Ear	**Reading**: Anatomy of the Ear; **Assignment**: Diagram of the External Ear
	Anatomy of the External Ear: Pinna/Auricle	**Reading**: The External Ear Anatomy; **Assignment**: Describe the structure and function of the Pinna
	External Auditory Meatus: Structure and Function	**Reading**: Physiology of the auditory canal; **Assignment**: Case study of a patient with ear canal obstruction
Week 2	Tympanic Membrane: Anatomy and Function	**Reading**: Tympanic Membrane Structure and Function; **Assignment**: Explain the role of the tympanic membrane in sound transmission
	Anatomy of the Middle Ear: Overview	**Reading**: Middle Ear Anatomy; **Assignment**: Label the structures of the middle ear
	The Walls of the Middle Ear	**Reading**: Anatomy of the Middle Ear walls; **Assignment**: Identify the different walls and their functions in middle ear physiology
Week 3	Ossicles and Muscles of the Middle Ear	**Reading**: Ossicles and their role in hearing; **Assignment**: Case study on ossicular chain dysfunction
	Anatomy of the Eustachian Tube	**Reading**: Function of the Eustachian tube in pressure regulation; **Assignment**: Explain how dysfunction of the Eustachian tube affects hearing
	Anatomy of the Inner Ear: Overview	**Reading**: Anatomy of the Inner Ear; **Assignment**: Label the parts of the inner ear

Week 4	Bony Labyrinth: Structure and Function	**Reading**: Bony labyrinth and its role in balance; **Assignment**: Describe the bony labyrinth's role in hearing and balance
	Membranous Labyrinth: Structure and Function	**Reading**: Membranous labyrinth; **Assignment**: Case study on disorders affecting the membranous labyrinth
	Structure of the Cochlea	**Reading**: Cochlea Structure and Function; **Assignment**: Diagram of cochlear structure and its divisions
Week 5	Anatomy of the Cochlea: Detailed Overview	**Reading**: Detailed description of cochlear anatomy; **Assignment**: Research paper on cochlear implants and their role in hearing restoration
	Organ of Corti: Structure and Function	**Reading**: Organ of Corti; **Assignment**: Explain the role of the Organ of Corti in sound transduction
	Structure and Types of Hair Cells in the Cochlea	**Reading**: Cochlear hair cells and their function; **Assignment**: Case study on hair cell damage and resulting hearing loss
Week 6	Vestibulocochlear Nerve: Structure and Function	**Reading**: Vestibulocochlear Nerve; **Assignment**: Diagram the vestibulocochlear nerve and its branches
	Nerve Pathways of Hearing	**Reading**: Neural Pathways of Hearing; **Assignment**: Explain the process of sound signal transmission from cochlea to auditory cortex
	Conditions Related to the Cochlea	**Reading**: Cochlear Pathologies; **Assignment**: Case study on cochlear hearing loss and its treatment options
Week 7	Conditions Related to the Vestibule	**Reading**: Vestibular Disorders; **Assignment**: Discuss the symptoms and management of vestibular dysfunction
	Pathophysiology of Cochlear Disorders	**Reading**: Pathophysiology of cochlear hearing loss; **Assignment**: Prepare a report on the pathophysiology of noise-induced hearing loss
	Pathophysiology of Vestibular Disorders	**Reading**: Vestibular Disorders; **Assignment**: Case analysis of Meniere's Disease
Week 8	Audiological Findings in Cochlear Pathologies	**Reading**: Audiological assessments for cochlear disorders; **Assignment**: Report on audiological tests for sensorineural hearing loss
	Audiological Findings in Vestibular Pathologies	**Reading**: Vestibular testing and its significance; **Assignment**: Prepare a diagnostic case study on vestibular disorders
	Management of Cochlear Disorders	**Reading**: Cochlear Disorder Management; **Assignment**: Write a treatment plan for a patient with cochlear hearing loss
Week 9	Management of Vestibular Disorders	**Reading**: Treatment options for

		vestibular disorders; **Assignment**: Discuss rehabilitation methods for vestibular dysfunction
	Diseases of the Inner Ear: Overview	**Reading**: Inner Ear Diseases; **Assignment**: Prepare a research paper on the most common inner ear diseases
	Sensorineural Hearing Loss: Causes and Management	**Reading**: Causes of sensorineural hearing loss; **Assignment**: Case study on sudden sensorineural hearing loss
Week 10	Labyrinthitis: Pathophysiology and Treatment	**Reading**: Labyrinthitis and its impact on hearing; **Assignment**: Discuss the pathophysiology and management of labyrinthitis
	Meniere's Disease: Pathophysiology and Management	**Reading**: Meniere's Disease; **Assignment**: Prepare a treatment approach for Meniere's Disease
	Vestibular Neuritis: Causes and Treatment	**Reading**: Vestibular neuritis; **Assignment**: Analyze the clinical presentation of vestibular neuritis
Week 11	Ototoxicity: Mechanisms and Audiological Impact	**Reading**: Ototoxicity; **Assignment**: Case study on ototoxic drugs and their effects on hearing
	Noise-Induced Hearing Loss: Prevention and Management	**Reading**: Noise-induced hearing loss; **Assignment**: Prepare a prevention plan for noise-induced hearing loss in workplaces
	Cochlear Implants: Indications and Technology	**Reading**: Cochlear Implants; **Assignment**: Research paper on the history and development of cochlear implants
Week 12	Auditory Rehabilitation and Aural Habilitation	**Reading**: Auditory rehabilitation techniques; **Assignment**: Design an auditory rehabilitation plan for a patient
	Hearing Aids: Types and Selection Criteria	**Reading**: Hearing Aids; **Assignment**: Prepare a report on the different types of hearing aids and their selection criteria
	Tinnitus: Diagnosis and Management	**Reading**: Tinnitus; **Assignment**: Case study on the management of chronic tinnitus
Week 13	Acoustic Trauma: Prevention and Audiological Assessment	**Reading**: Acoustic Trauma; **Assignment**: Discuss the long-term effects of acoustic trauma on hearing
	Audiometric Testing for Inner Ear Disorders	**Reading**: Audiometry for inner ear diseases; **Assignment**: Perform a simulated audiometric test and analyze results
	Advanced Audiological Tests: OAE and ABR	**Reading**: Advanced Audiological Techniques; **Assignment**: Demonstrate knowledge of Otoacoustic Emissions (OAE) and Auditory Brainstem Response (ABR)
Week 14	Balance Disorders: Diagnosis and Management	**Reading**: Balance Disorders; **Assignment**: Prepare a case study on a

		patient with a balance disorder
	Clinical Case Studies: Cochlear Pathologies	**Reading**: Case studies on cochlear disorders; **Assignment**: Analyze a case study and present a treatment plan
	Clinical Case Studies: Vestibular Pathologies	**Reading**: Case studies on vestibular disorders; **Assignment**: Present a treatment approach for a vestibular pathology
Week 15	Review of Pathologies of the Inner Ear	**Reading**: Review articles on common inner ear diseases; **Assignment**: Prepare a review of inner ear disorders
	Interdisciplinary Approach in Audiology	**Reading**: Multidisciplinary collaboration in managing ear disorders; **Assignment**: Prepare a collaborative treatment plan with other healthcare professionals
	Final Review: Ear Anatomy and Diseases	**Reading**: Full course review; **Assignment**: Final essay on the relationship between ear anatomy and common diseases
Week 16	Review of Audiological Testing and Interpretation	**Reading**: Interpreting audiological tests; **Assignment**: Practice interpreting audiological test results
	Patient Counseling in Audiology	**Reading**: Patient communication and counseling techniques; **Assignment**: Role play patient counseling for hearing loss
	Course Summary and Final Exam Preparation	**Reading**: Review all previous materials; **Assignment**: Prepare for final exam

Textbooks and Reading Material

- Bendowska, A., Malak, R., Zok, A., & Baum, E. (2022). The ethics of translational audiology. *Audiology Research*, *12*(3), 273-280.
- Johnson, C. D., & Seaton, J. B. (2020). *Educational audiology handbook*. Plural Publishing.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
  Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II

- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	**Elements**	**Weightage**	**Details**
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-304	Credit Hours	3 (3+0)
Course Title	Neuroanatomy and Embryology				

Course Introduction

This course provides an in-depth exploration of developmental anatomy and neuroanatomical structures, specifically focusing on their relevance to speech and hearing. It covers the developmental processes from early embryonic stages to adulthood, highlighting key structures such as the brain regions, craniofacial structures, and neural pathways that facilitate speech and auditory processing. Understanding these biological foundations is essential for speech-language pathologists, audiologists, and related professionals who work with individuals experiencing speech and hearing disorders. The course integrates concepts from neuroanatomy, physiology, and developmental biology to help students grasp the complex interactions between the brain, nervous system, and speech-hearing mechanisms.

Learning Outcomes

On the completion of the course, the students will:

- Understand key developmental stages of the brain, craniofacial structures, and auditory systems.
- Identify and describe brain regions, neural pathways, and cranial structures involved in speech and hearing.
- Explain how central nervous system structures contribute to speech production and auditory perception.
- Identify neuroanatomical abnormalities and their impact on speech and hearing development.
- Apply anatomical and neuroanatomical knowledge in clinical practice for diagnosing and treating speech and hearing disorders.

Course Content (Theory)		Assignments/Readings
Week 1	**Head and Neck Anatomy**: Musculoskeletal and neurovascular features, anterior and posterior triangles of the neck, subdivisions and contents. Main features of the skull and facial skeleton.	Read: Chapter on Head and Neck Anatomy. Review: The Skull and Facial Skeleton (Textbook).
	Cranial Fossae and Foramina: Identifying cranial fossae, hypophyseal fossa, internal and external auditory meatuses. Structures passing through foramen magnum and stylomastoid foramen.	Read: Cranial Foramina and Structures Passing Through (Textbook).
	Muscles of the Face and Neck: Muscles of facial expression, mastication, nerve supply, and action. Sternomastoid, scalene, and geniohyoid muscles: Attachments, actions, and nerve supply.	Read: Facial Muscles and Mastication (Textbook).
Week 2	**Neck Anatomy Continued**: Identifying cervical vertebrae (atlas, axis, C7), and muscles (erector spinae, sternomastoid, scalene). Phrenic, accessory, and vagus nerves, cervical and brachial plexuses.	Study: Cervical Vertebrae and Nerves (Online resources).
	Subclavian and Carotid Arteries: Identifying the position, distribution, and extent of subclavian, vertebral, and carotid arteries.	Read: Blood Vessels of Head and Neck (Textbook).
	Nervous System Subdivisions: Define central, peripheral, and autonomic nervous system and their subdivisions.	Review: Nervous System Overview (Lecture Notes).
Week 3	**Vertebral Column Anatomy**: Osteology of vertebral column, parts of a typical vertebra, vertebral groups. Curvatures of the vertebral column, and deformities.	Read: Vertebral Column and Joints (Textbook).
	Joints of the Vertebral Column: Structure, movements, and muscles producing these movements. Intervertebral discs and ligaments.	Study: Intervertebral Disc and Movements (Online resource).
	Spinal Cord Structure and Function: Position, form, and function of spinal cord. Neuronal connections and reflex pathways.	Read: Spinal Cord Overview (Textbook).

Week 4	**White and Gray Matter of Spinal Cord**: White and gray matter, anterior, lateral, and posterior columns. Important ascending and descending tracts.	Review: Spinal Cord Structure (Lecture Notes).
	Spinal Cord Injury: Effects of spinal cord transaction and hemi-section. Rationale of cordotomy. Blood supply and meninges of spinal cord.	Case Study: Spinal Cord Injury (Textbook).
	Brain Anatomy: Subdivisions of the brain, external features, and basic structure of brainstem. Cranial nerve nuclei, afferent and efferent tracts.	Study: Brainstem and Cranial Nerve Nuclei (Textbook).
Week 5	**Cerebellum and Cerebrum**: External and internal features of cerebellum, afferent/efferent tracts. Basic features of the cerebrum.	Read: Cerebellum and Cerebrum (Lecture Notes).
	Cerebrum Cortical Areas: Location of gyri, sulci, and cortical areas. Association, commissural, and projection fibers.	Review: Cortical Areas and Fiber Tracts (Textbook).
	Forebrain Anatomy: Cerebral cortex, insula, olfactory bulb, basal ganglia, thalamus, hypothalamus, internal capsule, and corpus callosum.	Read: Forebrain Anatomy (Textbook).
Week 6	**Sensory and Motor Pathways**: Trace sensory and motor pathways. Sensory and motor nerve endings with functions.	Study: Sensory and Motor Pathways (Online resources).
	Pyramidal and Extrapyramidal Systems: Definitions of pyramidal motor system, upper/lower motor neurons, and extrapyramidal system.	Read: Motor Pathways Overview (Lecture Notes).
	Sensory Organs: Structure of sensory organs (nose, tongue, eye, ear, skin).	Review: Sensory Organs Anatomy (Textbook).
Week 7	**Muscle Tone**: Nature and basis of muscle tone. Anatomical pathway involved in muscle tone production and maintenance.	Read: Muscle Tone and Pathways (Textbook).
	Limbic System: Anatomy and function of the limbic system in emotion and behavior.	Review: Limbic System (Lecture Notes).
	Autonomic Nervous System: Structure and position of the autonomic nervous system. Sympathetic and parasympathetic systems.	Read: Autonomic Nervous System Overview (Textbook).
Week 8	**Sympathetic and Parasympathetic Fibers**: Sites of origin and termination of preganglionic and postganglionic fibers.	Study: Sympathetic and Parasympathetic Systems (Lecture Notes).
	Sympathetic and Parasympathetic Ganglia: Locations of sympathetic and parasympathetic ganglia.	Review: Autonomic Ganglia (Textbook).
	CSF and Meninges: Formation, circulation, drainage of CSF. Identify ventricles, meninges, and cisterns. Lumbar and cisternal puncture.	Read: CSF Formation and Circulation (Textbook).
Week 9	**Meninges and Hemorrhages**: Features of meninges, differences between extradural, subdural, and subarachnoid hemorrhages.	Review: Meninges and Hemorrhage Types (Lecture Notes).
	Blood Supply of Brain: Major blood vessels around the brain and spinal cord. Circle of Willis and arteries supplying brain.	Study: Blood Vessels and Circulation (Textbook).
	Cerebral Artery Occlusion: Predict the results of blockage or rupture of central deep branches.	Review: Cerebral Artery Occlusion (Textbook).
Week 10	**Occlusion of Vertebral and Basilar Arteries**: Predicts outcomes of occlusion in vertebral or basilar arteries.	Study: Vertebral and Basilar Arteries (Online resources).

	Dural Venous Sinuses: Identifying connections of dural venous sinuses.	Read: Dural Venous Sinuses (Textbook).
	Review of Spinal Cord and Brain Anatomy: Review of spinal cord and brain structure with emphasis on clinical implications.	Study: Comprehensive Review (Lecture Notes).
Week 11	**Neurovascular Structures**: Review of cranial and spinal neurovascular anatomy and implications for surgery.	Review: Neurovascular Anatomy (Online resources).
	Brainstem and Cranial Nerves: Focus on cranial nerve nuclei and their pathways.	Review: Cranial Nerve Nuclei (Textbook).
	Cerebellum and Corticospinal Tract: Review of cerebellar anatomy and corticospinal tract function.	Study: Cerebellum and Motor Pathways (Textbook).
Week 12	**Reflex Arcs and Spinal Tracts**: Understanding reflex pathways and spinal tract functions.	Review: Reflexes and Spinal Tracts (Online resources).
	Pyramidal vs. Extrapyramidal Pathways: Detailed comparison of pyramidal and extrapyramidal pathways.	Study: Pyramidal and Extrapyramidal Systems (Lecture Notes).
	Autonomic Pathways: Detailed study of sympathetic and parasympathetic pathways.	Review: Autonomic Pathways (Textbook).
Week 13	**Review of Sensory Organs**: Overview of the sensory organs and their associated pathways.	Study: Sensory Organ Anatomy (Online resources).
	Muscle Tone Pathways: Review of the pathway and maintenance of muscle tone.	Review: Muscle Tone Pathways (Lecture Notes).
	Limbic System and Emotion: Review of the limbic system's role in emotion and behavior.	Study: Limbic System Function (Textbook).
Week 14	**CSF and Meninges**: Detailed review of CSF circulation, meninges, and lumbar puncture.	Read: Meninges and CSF (Textbook).
	Blood Supply of the Brain (Continued): Predict the effects of occlusion of cerebral and spinal arteries. Identify collateral circulation.	Study: Blood Supply to Brain and Spinal Cord (Lecture Notes).
	Review of Blood Vessels and Cerebral Arteries: Focus on the Circle of Willis and its clinical significance.	Read: Circle of Willis and Clinical Implications (Textbook).
Week 15	**Clinical Implications of Vascular Lesions**: Predict the results of vascular occlusion in the brain (stroke, ischemia).	Study: Stroke and Vascular Lesions (Textbook and Online Resources).
	Neuroanatomy of the Autonomic Nervous System: Detailed study of sympathetic and parasympathetic systems, including physiological effects.	Review: Autonomic Nervous System (Lecture Notes).
	Autonomic Reflexes: Study of autonomic reflex pathways, their integration with other systems, and their clinical relevance.	Read: Autonomic Reflexes and Disorders (Textbook).
Week 16	**Neuroanatomy of Limbic System**: Detailed review of the limbic system's role in emotion, memory, and behavior.	Study: Limbic System Functions (Online Resources).
	Spinal Cord and Brain Pathologies: Review of common spinal cord and brain pathologies (e.g., multiple sclerosis, spinal cord injuries) and their anatomical basis.	Case Study: Neurological Disorders (Textbook and Research Articles).
	Final Review and Exam Preparation: Comprehensive review of neuroanatomy and embryology concepts. Discuss clinical implications and treatment approaches.	Final Review (Lecture Notes and Textbook).

Textbooks and Reading Material

- "Neuroanatomy in Clinical Context: An Atlas of Structures, Sections, Systems, and Syndromes" by Duane E. Haines and Gregory A. Mihailoff –
- "Clinical Neuroanatomy Made Ridiculously Simple" by Stephen Goldberg
- Human Embryology" by William J. Larsen

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-305	Credit Hours	3(2+1)
Course Title	Basic Electronics				

Course Introduction

Basic Electronics A is an introductory course designed to provide students with a comprehensive understanding of the fundamentals of electricity, with a strong focus on safety, core electrical concepts, and the essential math skills required in the field. The course covers the foundational principles of electricity, including the operation of various types of diodes. Additionally, students will gain hands-on experience with signal acquisition techniques, particularly in relation to electrodes and transducers, equipping them with the necessary knowledge and skills for practical applications in electronics.

Learning Outcomes

On the completion of the course, the students will:

- Demonstrate proficiency in medical terminology, anatomy, and physiology.
- Apply ethical principles and patient-centered care in diverse healthcare settings.
- Effectively utilize medical equipment and technology in diagnosis and treatment.
- Perform diagnostic and therapeutic procedures under supervision.
- Interpret and analyze clinical data for informed decision-making.
- Communicate effectively with patients, families, and healthcare teams.
- Understand and adhere to safety protocols and healthcare regulations.
- Develop critical thinking and problem-solving skills for patient care and treatment planning.

Course Content (Theory)		Assignments/Readings
Week 1	Basics of electricity; Direct and alternating current (AC/DC)	Assignment: Basic DC and AC circuit analysis. Read about Ohm's Law and Kirchhoff's Laws.
	Electrical energy and power; Power supplies	Reading: Power generation, distribution, and energy conversion methods.
Week 2	Filters, Amplifiers, and Oscillators	Assignment: Design and analyze a basic amplifier circuit using operational amplifiers.
	Basic principles of diodes; Working of Diodes	Reading: Study the principles of diode operation, including forward and reverse bias.
Week 3	Working of Transistors, FETs & UTTs	Assignment: Compare and contrast the characteristics of BJTs and FETs.
	LED's, LCD's, ICs: Structure and operation	Reading: Understand the working principles and applications of LEDs and LCDs.
Week 4	Fundamentals of digital electronics	Assignment: Solve problems related to logic gates, truth tables, and basic number systems.
	Hardware, memory devices, and other peripherals	Reading: Explore different types of memory (RAM, ROM, Flash) and their uses in electronics.
Week 5	Microphones as transducers: Velocity microphones (uni-directional)	Assignment: Study the characteristics of microphones, including impedance and sensitivity.
	Loudspeakers as transducers; Structure of a dynamic loudspeaker	Reading: Study the design and efficiency of dynamic loudspeakers and their role in audio systems.

Week 6	Air suspension, Baffles, enclosures, horn speakers	Assignment: Investigate multi-speaker systems and their benefits in audio reproduction.
	Loudspeaker efficiency, recording and reproduction of sound	Reading: Understand loudspeaker efficiency and its impact on sound quality and reproduction.
Week 7	Recording characteristics: Dynamic range, stereophonic recording	Assignment: Analyze dynamic range and techniques used in stereophonic sound recording.
	Digital tape recording, CD ROM recording, High-fidelity recording	Reading: Explore digital recording technologies such as CD ROM and tape recording.
Week 8	AM/FM tuners, Amplifier power and distortion, Loudspeaker power	Assignment: Analyze distortion in audio systems and their effects on sound quality.
	Measurement instruments: Multimeter, Oscilloscope, Audio generator, Frequency counter	Reading: Familiarize with measurement instruments used in electronics and their functions.
Week 9	Function generator, Spectrum analyzer, Distortion analyzer	Assignment: Use a spectrum analyzer to identify and measure signal distortion.
	Level recorder, Applied electronics, Fundamentals of electronics and computers	Reading: Study the role of electronics in healthcare and medical diagnostics.
Week 10	Block diagram of a computer, Functional block diagram of hearing aids	Assignment: Review and understand the functional block diagram of hearing aids.
	Functional block diagram and working of audiometers	Reading: Learn how audiometers are used in hearing tests and their block diagrams.
Week 11	Instrumental calibration of pure tone audiometers	Assignment: Study the process and importance of calibrating pure tone audiometers.
	Basics of speech audiometry	Reading: Explore the fundamentals of speech audiometry and its clinical significance.
Week 12	Principles of immitance, Electrocochleography (ECochG), ENG	Assignment: Investigate the principles and clinical applications of immitance and ECochG testing.
	Operating system languages, application software	Reading: Understand the role of operating systems and software in medical devices and audiology.
Week 13	Biomedical signals and signal processing	Assignment: Explore signal processing techniques used in the analysis of biomedical signals.
	Principles of generation of acoustic stimuli; Pure tone, tone bursts, filtered clicks	Reading: Study the methods of generating acoustic stimuli for audiological testing.
Week 14	Acoustic/Physical characteristics of stimuli, gating, and filtering of stimuli	Assignment: Investigate how stimulus characteristics are manipulated in audiology through gating and filtering.

	Evoked potential: Worked principle, Electrodes, Recording of responses	Reading: Understand the principles and techniques involved in recording evoked potentials.
Week 15	Electrodes and transducers; Signal acquisition techniques	Assignment: Study the use of electrodes and transducers for signal acquisition in medical devices.
	Signal processing techniques: Differential amplification, Common mode rejection	Reading: Learn about differential amplification and common-mode rejection in signal processing.
Week 16	Artifact rejection, Filtering, Signal averaging	Assignment: Explore techniques for signal processing, focusing on artifact rejection and signal averaging.
	Overview and recap of course content; Review of signal processing in healthcare	Final review assignment: Consolidate understanding of all topics, focusing on the practical applications of electronics in healthcare.
Course Content (Lab)		**Assignments/Readings**
Week 1	Basics of electrical circuits and safety protocols	Hands-on: Circuit construction and safety procedures
Week 2	Power supplies and voltage regulation	Lab: Designing a power supply circuit
Week 3	Filters and amplifiers; Operational amplifiers	Practical: Build and test a low-pass filter
Week 4	Diodes, Transistors, and FETs	Lab: Testing the characteristics of diodes and transistors
Week 5	LEDs, LCDs, and ICs	Practical: Construct an LED display circuit
Week 6	Introduction to digital electronics	Lab: Basic digital logic gate operations
Week 7	Measurement with a multimeter and oscilloscope	Practical: Using multimeters for voltage, current, and resistance measurement
Week 8	Audio generator and function generator	Lab: Generating audio signals using function generators
Week 9	Measurement with spectrum analyzer and distortion analyzer	Practical: Measuring and analyzing audio frequencies
Week 10	Testing and calibration of microphones	Lab: Impedance and sensitivity testing of microphones
Week 11	Dynamic loudspeakers and air suspension	Practical: Disassemble and study a dynamic loudspeaker
Week 12	Stereophonic recording techniques	Lab: Basic sound recording with stereo microphones
Week 13	CD ROM recording, tape speed and frequency response	Practical: Measuring tape speed and frequency response
Week 14	Calibration of pure tone audiometers	Lab: Calibrating and testing pure tone audiometers
Week 15	Signal processing: Differential amplification	Practical: Implementing differential amplification circuits
Week 16	Signal acquisition techniques from electrodes and	Lab: Signal acquisition and

	transducers	processing using electrodes and transducers

Textbooks and Reading Material

- Electronic Devices and Circuit Theory" by Robert L. Boylestad and Louis Nashelsky
- Fundamentals of Electric Circuits" by Charles K. Alexander and Matthew N. O. Sadiku
- Electronic Principles" by Albert Malvino and David Bates

Teaching Learning Strategies

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- **Case Studies**
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- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-306	Credit Hours	3(1+2)
Course Title	Audiology Practice				

Course Introduction

This course focuses on the identification, assessment, diagnosis, and treatment of individuals with impairments of either peripheral or central auditory and/or vestibular function, with an emphasis on preventing such impairments. Audiologists play a key role in providing both clinical and academic training to students in the field of audiology. The course equips students with foundational knowledge and skills relevant to clinical audiology settings. Topics covered include familiarization with safety protocols such as the location of fire extinguishers and emergency exits, as well as an introduction to the field of audiology through exposure to public information materials. Additionally, students will learn to identify various types of audiometers and their accessories, and refer to respective manuals for proper use and maintenance.

Learning Outcomes

On the completion of the course, the students will:

- **Identify and assess auditory and vestibular impairments** in individuals, both peripheral and central, and understand their impact on hearing and balance functions.
- **Diagnose hearing and balance disorders** using appropriate clinical tools, tests, and procedures.
- **Develop and implement treatment plans** for individuals with auditory and/or vestibular dysfunctions, with a focus on effective rehabilitation strategies.
- **Understand and apply preventive measures** to reduce the risk of auditory and vestibular impairments.
- **Demonstrate proficiency in audiological equipment** such as audiometers, understanding their types, accessories, and usage as per respective manuals.
- **Perform clinical tasks with safety awareness**, including familiarization with emergency exits, fire extinguishers, and other safety protocols within the audiology clinic.
- **Interpret and apply public information materials** to raise awareness of hearing and balance health within the community.
- **Utilize appropriate audiological procedures** in both adult and pediatric assessments to gather relevant case history and conduct thorough evaluations.
- **Maintain and troubleshoot audiological instruments**, ensuring optimal functionality for accurate testing.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Basic Audiology: Overview of Audiology and the importance of hearing health	Read chapter on Introduction to Audiology from the course textbook
Week 2	Safety in Audiology Practice: Location of fire extinguishers, emergency exits, and safety protocols	Watch the safety procedures video, read safety guidelines
Week 3	Exposure to Audiology: Overview of public information material (videos, pamphlets, booklets) related to audiology	Review pamphlet on audiological assessments and hearing health
Week 4	Case History Taking for Adults and Children: Understanding and documenting case history for normal hearing individuals	Read and prepare case history forms for normal hearing subjects
Week 5	Case History for Individuals with Hearing Impairment: Identifying signs and symptoms of hearing impairment in children and adults	Study case history forms with hearing impairment details
Week 6	Case History for Individuals with Normal Speech and Language Functions: Assessing hearing abilities in subjects with normal speech and language functions	Review case histories with normal speech and language
Week 7	Case History for Speech and Hearing Disorders: Identifying issues related to speech and hearing disorders	Study case history forms related to speech and hearing disorders
Week 8	Audiological Instruments and Equipment: Overview of audiometer types (AC/BC/Sound Field) and their functions	Read manuals of different audiometers and prepare notes

Week 9	Sound Stimuli in Audiology: Introduction to sound stimuli used for hearing assessment	Review the types of sound stimuli used in audiometric tests
Week 10	Audiometer Troubleshooting and Maintenance: Identifying, checking, and troubleshooting audiometer components	Prepare a troubleshooting checklist for audiometers
Week 11	Calibration of Audiometers: Understanding the process of calibration and its importance in accurate testing	Review calibration standards and procedures for audiometers
Week 12	Pure Tone Audiometry and Speech Audiometry: Introduction to audiometric testing for hearing thresholds	Study different audiometric tests and methods of pure tone audiometry
Week 13	Immittance Audiometry and Acoustic Reflex Testing: Introduction to tympanometry and reflex testing	Read material on immittance audiometry and acoustic reflex testing
Week 14	Pediatric Audiology: Overview of pediatric audiological assessments including BOA, VRA, and Play Audiometry	Study protocols for pediatric audiology assessments
Week 15	Audiogram Plotting and Interpretation: Understanding audiograms and classification of hearing loss types	Review audiograms and learn to calculate interaural attenuation and occlusion effect
Week 16	Audiometer Calibration Demonstration: Importance of calibration and correction charts	Prepare for a demonstration of audiometer calibration
Course Content (Lab)		**Assignments/Readings**
Week 1	Introduction to Audiology Clinic Setup and Safety	Orientation to the clinic, locating fire extinguishers and emergency exits
	Taking Case History for Normal Hearing Individuals	Conduct case history for at least 5 normal hearing subjects under supervision
Week 2	Taking Case History for Individuals with Hearing Impairment	Conduct case history for 5 hearing-impaired individuals under supervision
	Audiometer Types and Accessories	Identify and familiarize with different types of audiometers and their accessories
Week 3	Performing Pure Tone Audiometry (AC and BC)	Obtain audiograms for at least 10 normal hearing subjects using audiometers
	Troubleshooting Audiometers	Perform listening checks and troubleshoot the audiometer and its components
Week 4	Audiometer Calibration Practice	Demonstrate calibration procedures for different types of audiometers
	Speech Audiometry: Assessing Speech Reception Threshold (SRT)	Practice performing speech audiometry under supervision
Week 5	Immittance Audiometry and Tympanometry	Conduct tympanometry and immittance testing for a variety of cases
	Acoustic Reflex Testing: Ipsilateral and Contralateral	Conduct acoustic reflex testing for 5 subjects (ipsilateral and contralateral)
Week 6	Pediatric Audiology - BOA (Behavioral Observation Audiometry)	Conduct BOA testing for 5 normal and 5 hearing-impaired children
	Pediatric Audiology - VRA (Visual Reinforcement Audiometry)	Perform VRA for 5 normal and 5 hearing-impaired children

Week 7	Pediatric Audiology - Play Audiometry	Conduct play audiometry for 5 normal and 5 hearing-impaired children
	Sound Field Testing: Presentation and Procedures	Perform sound field testing using various stimuli for normal and hearing-impaired children
Week 8	Audiogram Plotting and Masking Procedures	Obtain audiograms with masking for at least 5 cases and plot the results
	Otoscopic Screening and Ear Mold Impressions	Perform otoscopic screening prior to tympanometry and ear mold impression procedures
Week 9	Practice Case History and Interviewing Techniques	Independently take case history from at least 5 clients/caregivers
	Case History Review and Post-Test Counseling	Assist supervisor with post-test counseling for hearing-impaired clients
Week 10	Calibration and Correction Chart Preparation	Prepare correction charts and assist in the calibration process of audiometers
	Conducting Audiological Evaluations Independently	Independently perform audiological evaluations on at least 5 normal hearing subjects
Week 11	Acquiring Audiograms Independently (AC and BC)	Independently conduct audiograms (AC and BC) on at least 20 cases
	Identifying the Degree and Nature of Hearing Loss	Classify audiograms and assess degree and contour of hearing loss
Week 12	Masking and Audiogram Interpretation	Perform audiogram masking for at least 5 subjects and classify hearing loss type
	Understanding the Occlusion Effect and Interaural Attenuation	Calculate interaural attenuation and occlusion effect for audiogram readings
Week 13	Routine Maintenance and Troubleshooting of Audiometry Equipment	Conduct routine maintenance and troubleshooting checks on audiometric equipment
	Pediatric Audiological Assessment Techniques	Practice pediatric audiometry techniques under supervision
Week 14	Audiometer Accessories and Listening Check	Perform a listening check and report the status of headphones, earphones, and BC vibrators
	Conducting Acoustic Reflex Testing and Tympanometry	Perform reflex testing and tympanometry on a range of cases
Week 15	Reviewing Audiological Cases and Classification of Hearing Loss	Classify audiograms for various cases and perform analysis of hearing loss type
	Final Practical Assessment Preparation	Review and practice all practical components in preparation for final assessment
Week 16	Final Practical Assessment	Complete a final practical assessment on audiological evaluations, testing, and troubleshooting

	Post-Practical Reflection and Report	Submit a report on the practical assessment, reflecting on learning and experience

Textbooks and Reading Material

-
- Martin, F. N., & Clark, J. G. (2003). Introduction to audiology.
- Wilson, C. (2002). Essentials of Audiology By Stanley A. Gelfand. *JOURNAL OF AUDIOLOGICAL MEDICINE*, *11*(3), 193-193

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-lifeexamples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-307	Credit Hours	3(2+1)
Course Title	Audiological Practice				

Course Introduction

This comprehensive course is designed to equip healthcare professionals with the necessary skills to assess and diagnose hearing loss in infants, toddlers, children, and adolescents. Participants will learn how to effectively conduct a variety of hearing tests and evaluations to determine the presence, degree, and causes of hearing impairment in pediatric patients. Emphasis will be placed on understanding age-specific challenges and utilizing appropriate diagnostic tools to provide accurate results and optimal care.

Learning Outcomes

On the completion of the course, the students will:

- **Understand the different types and causes of hearing loss** in infants, toddlers, children, and teens, including congenital, acquired, and genetic factors.
- **Perform age-appropriate hearing assessments and tests**, including behavioral observation, otoacoustic emissions (OAEs), auditory brainstem response (ABR), and pure-tone audiometry.
- **Interpret audiometric results** to determine the presence, degree, and configuration of hearing loss in pediatric patients.
- **Identify common challenges and strategies** for evaluating hearing loss in young children and non-verbal patients, ensuring reliable results.
- **Develop a comprehensive management plan** for children with hearing loss, including referrals, intervention options, and follow-up care to support optimal developmental outcomes.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Audiological Practice; Importance of Case History and Client Interaction	Reading: Overview of Audiological Practice; Assignment: Case History Form Analysis
	Case History Information Gathering; Interview Techniques for Clients and Caregivers	Reading: Case History Techniques; Assignment: Mock Case History Interview
Week 2	Audiological Instruments: AC, BC, Sound Field Equipment	Reading: Types of Audiological Instruments; Assignment: Instrument Identification Exercise
	Audiometers and Their Accessories: Overview and Manuals	Reading: Audiometer Types and Accessories; Assignment: Audiometer Manual Review
Week 3	Introduction to Pure Tone Audiometry and Speech Audiometry	Reading: Pure Tone Audiometry Principles; Assignment: Pure Tone Audiometry Theory Questions
	Immittance Audiometry; Tympanometry and Acoustic Reflex Testing	Reading: Immittance Audiometry Techniques; Assignment: Tympanometry and Acoustic Reflex Testing Procedure
Week 4	Pediatric Audiological Assessment: Informal Screening	Reading: Pediatric Audiological Assessment Techniques; Assignment: Screening Procedure Review
	Behavioral Observation Audiometry (BOA), Visual Reinforcement Audiometry (VRA), Play Audiometry	Reading: Pediatric Audiological Procedures; Assignment: Video Analysis of Pediatric Audiometry
Week 5	Sound Field Testing: BOA, VRA, Play Audiometry	Reading: Sound Field Audiometry in Children; Assignment: Case Studies in Pediatric Audiometry

	Audiological Evaluation for Different Cases	Reading: Clinical Audiological Evaluation Methods; Assignment: Case Evaluation Worksheet
Week 6	Plotting Audiograms and Calculation of Interaural Attenuation, Occlusion Effect	Reading: Audiogram Interpretation; Assignment: Audiogram Plotting Exercise
	Obtaining Audiograms Independently: AC and BC Testing	Reading: Audiogram Testing Procedures; Assignment: Independent Audiogram Testing
Week 7	Audiograms with Masking: Principles and Techniques	Reading: Masking Procedures in Audiometry; Assignment: Masking Case Scenarios
	Classification of Hearing Loss Based on Audiogram Interpretation	Reading: Types of Hearing Loss; Assignment: Classify Given Audiograms
Week 8	Instructions for Administering Audiometric Tests	Reading: Effective Test Administration Techniques; Assignment: Administering Audiometry Test Script
	Calibration of Audiometers; Demonstration of Calibration Procedures	Reading: Audiometer Calibration Guidelines; Assignment: Calibration Procedure Demonstration Review
Week 9	Types of Hearing Loss: Conductive, Sensorineural, Mixed	Reading: Conductive vs. Sensorineural Hearing Loss; Assignment: Case Study on Hearing Loss Types
	Masking Principles in Audiometry	Reading: Masking Techniques; Assignment: Masking Calculation Exercises
Week 10	Advanced Tympanometry Techniques	Reading: Tympanometry Procedures; Assignment: Tympanometry Case Study
	Acoustic Reflex Testing: Ipsi and Contra	Reading: Acoustic Reflex Procedures; Assignment: Acoustic Reflex Interpretation
Week 11	Pediatric Audiological Assessment: BOA, VRA, Play Audiometry in Depth	Reading: Pediatric Audiological Assessment; Assignment: Pediatric Case Study
	Impact of Noise on Hearing: Prevention and Management	Reading: Noise-Induced Hearing Loss; Assignment: Noise Prevention Strategies
Week 12	Speech Audiometry Techniques	Reading: Speech Audiometry Principles; Assignment: Speech Audiometry Case Studies
	Principles of Audiometric Test Administration and Results Interpretation	Reading: Best Practices in Test Administration; Assignment: Audiometric Results Review
Week 13	Pediatric Audiology: BOA, VRA, and Play Audiometry (Theory and Procedures)	Reading: Pediatric Audiology Tests; Assignment: Case Studies in Pediatric Audiology
	Advanced Audiological Procedures	Reading: Advanced Audiology Techniques; Assignment: Advanced Case Studies

Week 14	Audiological Rehabilitation: Hearing Aids and Cochlear Implants	Reading: Hearing Aids & Cochlear Implants; Assignment: Audiological Rehabilitation Case
	Clinical Approaches for Severe to Profound Hearing Loss	Reading: Severe and Profound Hearing Loss; Assignment: Case Study of Severe Hearing Loss
Week 15	Audiometry with Masking for Complex Cases	Reading: Complex Masking Procedures; Assignment: Masking Scenarios
	Audiogram Interpretation: Degree, Type, and Configuration of Hearing Loss	Reading: Audiogram Interpretation; Assignment: Analyze and Interpret Audiograms
Week 16	Ethics and Professionalism in Audiology	Reading: Ethics in Audiology Practice; Assignment: Professional Conduct in Audiology
	Review and Final Exam Preparation	Review of all course materials; Final Exam
Course Content (Lab)		**Assignments/Readings**
Week 1	Case History Collection Under Supervision	Conduct mock case history interviews with peers
Week 2	Assist Supervisor with Preset Interview and Post-Test Counseling	Participate in a simulated counseling session
Week 3	Identifying Audiological Instruments: AC/BC/Sound Field	Hands-on identification of clinic instruments and accessories
Week 4	Pure Tone Audiometry, Speech Audiometry Setup and Operation	Conduct supervised pure tone audiometry and speech audiometry
Week 5	Immittance Audiometry: Tympanometry and Acoustic Reflex Testing	Perform immittance audiometry and acoustic reflex testing under supervision
Week 6	Pediatric Audiological Assessment: Informal Screening	Conduct informal hearing screening on children (at least 5 normal and 5 hearing impaired)
Week 7	Sound Field Testing: BOA, VRA, Play Audiometry	Perform sound field testing on children using BOA, VRA, and Play Audiometry
Week 8	Obtain Audiograms Independently: AC and BC Testing	Perform pure tone audiometry for adults and children (at least 5 cases each)
Week 9	Audiograms with Masking: AC and BC with Masking Procedures	Perform audiometry with masking (at least 5 cases)
Week 10	Plotting Audiograms and Interaural Attenuation Calculations	Plot audiograms and calculate interaural attenuation
Week 11	Calibration of Audiometers	Demonstrate audiometer calibration techniques and perform calibration
Week 12	Preparing Correction Chart for Audiometers	Prepare correction charts for audiometers based on calibration data
Week 13	Otoscopic Screening and Ear Mold Impressions	Perform otoscopic screenings and ear mold impressions for clients
Week 14	Audiogram Classification Based on Hearing Loss Type	Classify given audiograms according to the nature of the hearing loss

Week 15	Conducting Audiological Evaluation for Various Cases	Participate in a supervised audiological evaluation for multiple cases
Week 16	Final Practical Demonstration: Conduct Audiometric Tests	Complete a final practical test, including pure tone audiometry, masking, and audiogram plotting

Textbooks and Reading Material

- Bendowska, A., Malak, R., Zok, A., & Baum, E. (2022). The ethics of translational audiology. *Audiology Research*, *12*(3), 273-280.
- Johnson, C. D., & Seaton, J. B. (2020). *Educational audiology handbook*. Plural Publishing.

Teaching Learning Strategies

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- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
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3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-308	Credit Hours	3(2+1)
Course Title	Pediatric Audiology				

Course Introduction

This course provides in-depth knowledge and practical skills for examining children, especially infants, for hearing loss and related auditory issues. Participants will learn to perform various hearing tests and evaluations to determine the presence, severity, and potential causes of hearing loss. Through a combination of theoretical content and hands-on training, this course will prepare healthcare professionals to identify early signs of hearing impairment, recommend appropriate interventions, and support the development of effective management plans for affected children.

Learning Outcomes

On the completion of the course, the students will:

- **Identify early signs and symptoms of hearing loss in infants and young children**, and understand their potential impact on speech and language development.
- **Administer a variety of hearing assessments** (e.g., otoacoustic emissions, auditory brainstem response, behavioral audiometry) to accurately evaluate hearing ability in pediatric patients.
- **Interpret test results to determine the presence, type, and degree of hearing loss**, and differentiate between conductive, sensorineural, and mixed hearing loss.
- **Evaluate the potential causes of hearing loss** in children, including genetic factors, prenatal and postnatal conditions, and environmental risks.
- **Develop and implement appropriate referral and management plans** based on assessment outcomes, and provide guidance to parents and caregivers on intervention options, including amplification devices, speech therapy, and early educational support.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Pediatric Audiology: Overview of auditory development, prenatal hearing, newborn hearing	Reading: auditory development. Assignment: Discuss the prenatal hearing process.
	Causes of hearing loss in children: Genetic causes (late-onset, progressive)	Reading: Article on genetic causes of hearing loss. Assignment: Case study on progressive genetic hearing loss.
Week 2	Non-genetic causes of hearing loss: Congenital vs. Acquired	Reading: Overview of non-genetic hearing loss. Assignment: Case study on congenital vs acquired hearing loss.
	Importance of case history in pediatric audiology	Reading: Guidelines for case history in pediatric audiology. Assignment: Prepare a case history format.
Week 3	Early identification of hearing loss: Need for early intervention (conductive vs. sensorineural hearing loss)	Reading: Early intervention protocols. Assignment: Discuss the importance of early identification in both types of hearing loss.
	Screening for hearing loss: Newborn hearing screening programs	Reading: Overview of newborn hearing screening. Assignment: Research and report on screening programs.
Week 4	High-risk registers for hearing loss	Reading: High-risk factors in pediatric audiology. Assignment: Create a sample high-risk register.
	Behavioral tests in pediatric audiology: Stimuli, procedures, response recording, and interpretation	Reading: Behavioral testing protocols. Assignment: Prepare a

		report on testing procedures for children.
Week 5	Objective tests: Immittance screening, BERA/ABR/BSER, Otoacoustic emissions	Reading: Research on objective testing methods. Assignment: Discuss the role of OAE in early hearing loss detection.
	Screening for middle ear effusion and hearing sensitivity	Reading: Guidelines on screening for middle ear issues. Assignment: Write a paper on the importance of middle ear effusion screening.
Week 6	Instrumentation in pediatric audiometry: Individual vs. group testing	Reading: Overview of instrumentation for pediatric testing. Assignment: Compare individual vs. group testing methods.
	Pediatric audiometry: Behavioral Observation Audiometry (BOA)	Reading: Techniques for BOA. Assignment: Report on the application of BOA in hearing assessments.
Week 7	Conditioned Orientation Reflex Audiometry (CORA), Visual Reinforcement Audiometry (VRA)	Reading: Review of CORA and VRA techniques. Assignment: Prepare a report on VRA modifications for different age groups.
	Play Audiometry and its applications in pediatric testing	Reading: Play audiometry techniques. Assignment: Discuss the role of play audiometry in child hearing tests.
Week 8	Speech Audiometry in children: Speech Detection Threshold (SDT), Speech Recognition Threshold (SRT)	Reading: Review of speech audiometry techniques. Assignment: Conduct a literature review on SDT and SRT in children.
	Speech Recognition Tests: VASC, WIPI, NuChip, Glen Donald Auditory Screening Procedure (GASP)	Reading: Speech recognition test protocols. Assignment: Case study analysis of speech recognition testing.
Week 9	Early Speech Perception Test (EST) and its role in pediatric audiology	Reading: Overview of EST. Assignment: Prepare a comparison of EST and GASP.
	Physiological and electrophysiological measures: Immittance, ABR, OAE	Reading: Overview of physiological testing methods. Assignment: Compare ABR and OAE in newborn hearing testing.
Week 10	Functional Hearing Loss in Children: Diagnosis and screening tests	Reading: Research on functional hearing loss in children. Assignment: Case study on functional hearing loss identification.
	Pediatric ABR (Auditory Brainstem Response) testing: Techniques and application	Reading: ABR testing protocols. Assignment: Write a report on ABR's diagnostic utility in pediatric audiology.
Week 11	Otoacoustic Emissions (OAE): Testing and interpretation in children	Reading: OAE testing principles. Assignment: Prepare a study on

		OAE's significance in hearing loss screening.
	Vestibular assessment in children: Techniques and indications	Reading: Overview of vestibular assessments. Assignment: Discuss the role of vestibular testing in pediatric hearing disorders.
Week 12	Audiological assessment and clinical management of infants and children	Reading: Clinical management strategies. Assignment: Prepare an audiological management plan for a pediatric patient.
	The effect of hearing loss on speech and language development in children	Reading: Impact of hearing loss on child development. Assignment: Discuss the developmental implications of hearing loss.
Week 13	Role of pure-tone audiometry in pediatric diagnosis	Reading: Pure-tone audiometry protocols. Assignment: Case study on pure-tone audiometry in children.
	Speech Audiometry: Speech Recognition Tests and factors affecting accuracy	Reading: Speech audiometry considerations. Assignment: Report on factors affecting speech audiometry in children.
Week 14	Immittance Testing and its application in pediatric audiology	Reading: Immittance testing protocols. Assignment: Discuss the clinical importance of immittance testing.
	Pediatric Audiological Reporting: How to document and analyze results	Reading: Audiological reporting guidelines. Assignment: Prepare a sample pediatric audiology report.
Week 15	Pediatric Treatment Options: Hearing aids, cochlear implants, other assistive devices	Reading: Pediatric hearing aids and cochlear implants. Assignment: Compare different treatment options for pediatric hearing loss.
	Speech Audiometry: Early Speech Perception Test (EST) and Response Elicitation	Reading: Review of EST protocols. Assignment: Prepare a report on early speech perception tests.
Week 16	Pediatric Audiological Testing: Principles of follow-up care	Reading: Follow-up care in pediatric audiology. Assignment: Discuss the importance of follow-up testing and therapy.
	Review of pediatric audiological assessment methods and clinical management	Reading: Comprehensive review. Assignment: Final review of audiology assessment methods.
Course Content (Lab)		**Assignments/Readings**
Week 1	Introduction to Pediatric Audiology equipment and setup	Practical: Set up and calibrate pediatric audiology equipment for testing.
Week 2	Behavioral Observation Audiometry (BOA)	Practical: Perform BOA on infants and children under supervision.
Week 3	Conditioned Orientation Reflex Audiometry (CORA)	Practical: Conduct CORA with pediatric subjects.
Week 4	Visual Reinforcement Audiometry (VRA) and its modifications	Practical: Perform VRA testing with children and make adjustments as

		needed.
Week 5	Tangible Reinforcement Operant Conditioning Audiometry (TROCA)	Practical: Conduct TROCA testing on children.
Week 6	Play Audiometry techniques	Practical: Perform play audiometry on children of different age groups.
Week 7	Speech Audiometry: Speech Detection Threshold (SDT), Speech Recognition Threshold (SRT)	Practical: Administer SDT and SRT tests on children.
Week 8	Speech Recognition Tests: VASC, WIPI, NuChip	Practical: Conduct speech recognition tests and interpret the results.
Week 9	Early Speech Perception Test (EST) and GASP auditory screening	Practical: Administer EST and GASP screening tests.
Week 10	Immittance testing in pediatric audiology	Practical: Conduct immittance tests (tympanometry and acoustic reflex) in children.
Week 11	Otoacoustic Emissions (OAE) testing	Practical: Perform OAE testing on pediatric subjects and analyze results.
Week 12	Auditory Brainstem Response (ABR) testing	Practical: Conduct ABR testing on neonates and infants.
Week 13	Functional Hearing Loss in Children: Screening and Diagnosis	Practical: Perform functional hearing loss screening in children.
Week 14	Vestibular assessment in pediatric subjects	Practical: Conduct basic vestibular tests on children.
Week 15	Review of Pediatric Audiology testing procedures	Practical: Review and troubleshoot audiometric testing procedures.
Week 16	Final comprehensive pediatric audiology testing	Practical: Conduct a full audiological assessment using BOA, VRA, OAE, ABR, and immittance.

Textbooks and Reading Material

- Tharpe, A. M., & Seewald, R. (Eds.). (2016). *Comprehensive handbook of pediatric audiology*. Plural publishing.
- Bess, F. H., & Gravel, J. S. (2006). *Foundations of pediatric audiology: Identification and assessment*. Plural Publishing.

Teaching Learning Strategies

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Assignments: Types and Number with Calendar

- Quiz-1

- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

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3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-309	Credit Hours	3(2+1)
Course Title	Geriatric Audiology				

Course Introduction

This course covers the prevalence of hearing loss and balance issues, particularly in older adults, and explores the consequences of untreated hearing loss and difficulties with speech comprehension in aging populations. It provides foundational knowledge and practical skills in basic audiological tests and assessment approaches for adults. The course includes instruction on both subjective and objective testing methods used to evaluate hearing and balance problems in adults with hearing impairments.

Learning Outcomes

On the completion of the course, the students will:

- **Understand the Prevalence and Impact of Hearing Loss and Balance Issues:** Recognize the frequency of hearing loss and balance problems in the adult population, especially in older adults, and understand the consequences of untreated hearing loss and speech comprehension challenges.
- **Comprehend the Effects of Untreated Hearing Loss:** Understand how untreated hearing loss can impact quality of life, communication, and overall well-being in the aging population.
- **Familiarize with Audiological Testing Methods:** Gain knowledge of the basic audiological tests, both subjective and objective, used to assess hearing and balance in adults.
- **Evaluate Subjective Testing Approaches:** Learn how to administer and interpret subjective hearing tests, such as pure-tone audiometry and speech testing, to diagnose hearing impairments in adults.
- **Apply Objective Audiological Testing Techniques:** Understand and perform objective audiological tests, such as tympanometry and otoacoustic emissions (OAE), for assessing hearing and balance issues in adults.

Course Content (Theory)		Assignments/Readings
Week 1	Tuning Fork Tests: Rinne, Schwabach, Weber, Bing	Review tuning fork tests, study their interpretation and duration
	Interpretation of Tuning Fork Tests: Rinne, Schwabach, Weber, Bing	Read about the principles of tuning fork tests in geriatric audiology
Week 2	Audiometric version of Weber and Bing tests	Research the audiometric variations of Weber and Bing tests
	Pure Tone Audiometry: Introduction and Techniques	Study pure tone audiometry and its role in hearing assessment
Week 3	Masking: Definition, Types, and Critical Band Concept	Read about types of masking, critical band concept, and terminology
	Terminology Related to Masking: Test Ear, Non-Test Ear, etc.	Review definitions of key masking terms and their significance in audiometry
Week 4	Crossover, Cross Hearing, Shadow Curve in Masking	Study crossover, cross hearing, and shadow curve concepts in masking
	Criteria for Masking during AC and BC Testing	Review masking criteria for air conduction and bone conduction testing
Week 5	Speech Audiometry Tests: Speech Awareness Threshold (SAT)	Study SAT and its clinical relevance in geriatric audiology
	Speech Audiometry: Speech Recognition Threshold (SRT)	Research SRT, its clinical application and diagnostic value
Week 6	Word Recognition Score (WRS) and Poor Word Discrimination	Study WRS and understand the implications of poor word discrimination

	Speech-in-Noise Test: HINT Test	Read about the HINT test and its importance in assessing speech understanding in noise
Week 7	Calibration of Audiometers and Speech Audiometry	Research the calibration process and the role of speech audiometry in differential diagnosis
	Merits and Demerits of Speech Audiometry	Study the advantages and limitations of speech audiometry in clinical practice
Week 8	Immittance Audiometry: Principle and Instrumentation	Study the principles of immittance audiometry and the instrumentation used
	Tympanometry and Static Immittance Relaxometry	Research the types of immittance audiometry, including tympanometry
Week 9	Use of Immittance Audiometry in Clinical Population	Study how immittance audiometry helps detect middle ear pathology, cochlear issues, and retrocochlear pathology
	Immittance Audiometry in 7th Nerve Lesion and Pseudohypacusis	Research the role of immittance audiometry in diagnosing 7th nerve lesions and pseudohypacusis
Week 10	Immittance Audiometry for Predicting Thresholds	Study how immittance audiometry aids in predicting hearing thresholds
	Evoked Response Audiometry (ERA): Introduction	Study ERA, its instrumentation, and test procedure
Week 11	Instrumentation and Calibration of ERA	Review ERA instrumentation and its calibration procedure
	Interpretation of ERA Results	Research the interpretation of ERA results and the factors affecting it
Week 12	Factors Affecting Evoked Response Audiometry (ERA)	Study the factors that influence the results of ERA testing
	Test for Recruitment in Audiological Rehabilitation	Review the concept of recruitment in audiological rehabilitation in the geriatric population
Week 13	Presbycusis and Ototoxic Drugs	Research presbycusis, its impact, and the role of ototoxic drugs in hearing loss
	Pathway of the Auditory Nerve and its Clinical Relevance	Study the pathway of the auditory nerve and its role in hearing loss diagnosis
Week 14	Comprehensive Review of Geriatric Audiology	Prepare a review on geriatric audiology concepts covered in class
	Case Studies in Geriatric Audiology	Study case studies to understand real-world applications of audiological testing
Week 15	Treatment Options and Audiological Rehabilitation for the Elderly	Research treatment methods for the elderly, focusing on rehabilitation
	Emerging Trends in Geriatric Audiology	Review current research and emerging trends in the field of geriatric audiology

Week 16	Clinical Implications of Geriatric Audiology	Study the clinical applications and implications of audiology in the elderly population
	Final Exam Preparation and Review	Review all materials for the final exam
Course Content (Lab)		**Assignments/Readings**
Week 1	Tuning Fork Tests: Rinne, Schwabach, Weber, Bing	Perform tuning fork tests and practice interpretation
Week 2	Audiometric version of Weber and Bing tests	Conduct audiometric Weber and Bing tests
Week 3	Pure Tone Audiometry Testing	Perform pure tone audiometry on simulated patients
Week 4	Masking: Introduction and Practice	Practice masking techniques during audiometry tests
Week 5	Masking: Crossover, Cross Hearing, Shadow Curve	Perform practical masking exercises with crossover and shadow curve scenarios
Week 6	Speech Audiometry: SAT and SRT Testing	Practice conducting SAT and SRT tests with simulated patients
Week 7	Word Recognition Score (WRS) Testing	Perform WRS testing and analyze results
Week 8	Speech-in-Noise Testing: HINT Test	Conduct HINT tests and evaluate patient results
Week 9	Calibration of Audiometers	Practice calibration of audiometers to ensure accuracy of results
Week 10	Tympanometry and Static Immittance Testing	Conduct tympanometry and static immittance testing on patients
Week 11	Relaxometry and Middle Ear Pathology Detection	Practice relaxometry and diagnose middle ear pathologies using immittance audiometry
Week 12	Evoked Response Audiometry (ERA) Testing	Perform ERA testing and interpret the results
Week 13	Recruitment Testing in Audiological Rehabilitation	Conduct recruitment testing and assess its implications for rehabilitation
Week 14	Case Studies and Practical Analysis	Work on case studies to apply practical knowledge of geriatric audiology
Week 15	Simulated Full Audiological Evaluation	Conduct a full audiological evaluation, including pure tone audiometry, speech audiometry, and immittance testing
Week 16	Final Practical Exam	Perform a final practical examination, demonstrating proficiency in all areas of geriatric audiology
Textbooks and Reading Material		
• Dhingra, P. L., & Dhingra, S. (2013). *Diseases of Ear, Nose and Throat-E-Book*. Elsevier Health Sciences • Rossing, T. D. (2014). Introduction to acoustics. *Springer handbook of acoustics*, 1-7		
Teaching Learning Strategies		

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Assignments: Types and Number with Calendar

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- Quiz-II
- Presentation
- Professional Writing Assignments

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Programme	Audiology	Course Code	AUD-310	Credit Hours	3(2+1)
Course Title	Diagnostic Audiology I				

Course Introduction

The Diagnostic Audiology course offers a thorough examination of the principles, methods, and practices used in the assessment and diagnosis of auditory disorders and hearing impairments. Students will explore the anatomy and physiology of the auditory system while developing a strong theoretical and practical understanding of various audiological assessment techniques. Emphasis is placed on the identification and evaluation of hearing-related issues, with a focus on clinical applications and diagnostic accuracy.

Learning Outcomes

On the completion of the course, the students will:

- **Understand the anatomy and physiology of the auditory system**, including the structures and functions critical to hearing.
- **Apply theoretical knowledge** of audiological principles to real-world clinical scenarios, ensuring accurate assessment and diagnosis of auditory disorders.
- **Demonstrate proficiency in performing a range of diagnostic audiological tests**, such as pure-tone audiometry, speech audiometry, tympanometry, and otoacoustic emissions.
- **Interpret and analyze audiological test results** to identify hearing loss types and characteristics, and correlate findings with clinical symptoms.
- **Recognize and differentiate between various auditory disorders**, including conductive, sensorineural, and mixed hearing losses.
- **Develop effective patient communication strategies** for explaining diagnostic findings and recommending appropriate interventions or referrals.
- **Apply ethical and professional standards** in audiological practice, ensuring patient confidentiality, informed consent, and culturally sensitive care.
- **Critically assess the latest research and advancements** in diagnostic audiology to inform clinical practice and improve patient outcomes.

Course Content (Theory)		Assignments/Readings
Week 1	Case History	Reading: Overview of Audiology & Importance of Case History; Assignment: Case History Questionnaire
	Early Intervention	Reading: Early Intervention in Hearing Loss; Assignment: Identifying Early Intervention Strategies
Week 2	Early Identification of Hearing Loss	Reading: Techniques for Early Identification of Hearing Loss; Assignment: Case Studies on Early Identification
	Assessment of Hearing	Reading: Methods of Hearing Assessment; Assignment: Assessment Report on Hearing Loss
Week 3	Newborn Hearing Screening	Reading: Protocols for Newborn Hearing Screening; Assignment: Review of Screening Programs
	Behavioral Therapy	Reading: Behavioral Approaches in Audiology; Assignment: Designing a Behavioral Therapy Plan
Week 4	Hearing Test Protocol	Reading: Protocols in Conducting

		Hearing Tests; Assignment: Analyzing Hearing Test Protocols
	Tuning Fork Test	Reading: Types and Uses of Tuning Fork Tests; Assignment: Practical Application of Tuning Fork Tests
Week 5	Play Audiometry	Reading: Play Audiometry for Pediatric Auditory Testing; Assignment: Play Audiometry Case Study
	OAEs (Otoacoustic Emissions)	Reading: Introduction to OAEs; Assignment: Case Report on OAE Testing Results
Week 6	Types of OAEs	Reading: Different Types of OAEs (Spontaneous vs. Evoked); Assignment: Compare and Contrast OAE Types
	Tympanometry	Reading: Principles of Tympanometry; Assignment: Tympanometry Test Case Analysis
Week 7	VRA (Visual Reinforcement Audiometry)	Reading: Principles and Procedures of VRA; Assignment: VRA in Pediatric Testing
	Word Intelligibility by Picture Identification	Reading: Word Intelligibility Testing Methods; Assignment: Case Studies of Word Intelligibility Testing
Week 8	Evoked Response Audiometry	Reading: Principles of Evoked Response Audiometry; Assignment: Interpretation of Evoked Response Results
	Audiological Tests, PTA (Pure Tone Audiometry)	Reading: PTA Procedures and Interpretation; Assignment: PTA Test Report
Week 9	Types of Audiometers, Bekesy Audiometry	Reading: Types of Audiometers & Bekesy Audiometry; Assignment: Bekesy Audiometry Case Study
	Speech Audiometry	Reading: Techniques and Tools for Speech Audiometry; Assignment: Speech Audiometry Test Case
Week 10	Factors Affecting Speech Audiometry	Reading: Factors that Affect Speech Audiometry Results; Assignment: Identifying and Analyzing Influencing Factors
	Historical Perspective of Speech Audiometry	Reading: Evolution of Speech Audiometry; Assignment: Historical Review of Speech Audiometry Techniques
Week 11	High and Low Frequency in Tympanometry	Reading: Tympanometry at Different Frequencies; Assignment: Case Study on Frequency Effects in Tympanometry
	Multiple Frequencies in Tympanometry	Reading: Use of Multiple Frequencies in Tympanometry;

		Assignment: Tympanometry Data Analysis
Week 12	Tone Decay Test	Reading: Procedure and Application of Tone Decay Test; Assignment: Tone Decay Test Interpretation
	Auditory Development	Reading: Stages of Auditory Development in Children; Assignment: Research on Auditory Development Milestones
Week 13	Causes of Hearing Loss	Reading: Etiology of Hearing Loss; Assignment: Identifying Common Causes of Hearing Loss
	AC (Air Conduction) Audiometry	Reading: Air Conduction Audiometry Techniques; Assignment: AC Audiometry Test Review
Week 14	BC (Bone Conduction) Audiometry	Reading: Bone Conduction Audiometry Techniques; Assignment: BC Audiometry Test Review
	Masking	Reading: Principles of Masking in Audiometry; Assignment: Case Study on Masking Application
Week 15	Psychoacoustics	Reading: Introduction to Psychoacoustics; Assignment: Psychoacoustic Principles in Audiological Testing
	Review and Recap	Review of All Course Topics; Assignment: Comprehensive Audiology Report
Week 16	Exam Preparation	Exam Prep Guide; Assignment: Practice Exam
	Final Examination	-
Course Content (Lab)		**Assignments/Readings**
Week 1	Case History	Conducting a Mock Case History Interview
Week 2	Early Intervention	Role-play on Early Intervention Strategies
Week 3	Early Identification of Hearing Loss	Hands-on Exercise: Identifying Signs of Hearing Loss in Infants
Week 4	Assessment of Hearing	Practicing Hearing Assessment Techniques
Week 5	Newborn Hearing Screening	Performing a Newborn Hearing Screening
Week 6	Behavioral Therapy	Role-play: Implementing Behavioral Therapy Techniques
Week 7	Hearing Test Protocol	Practice Conducting Standard Hearing Tests
Week 8	Tuning Fork Test	Conducting Tuning Fork Tests (Rinne, Weber Tests)
Week 9	Play Audiometry	Demonstrating Play Audiometry with a Child

Week 10	OAEs (Otoacoustic Emissions)	Performing OAE Tests on Clients
Week 11	Types of OAEs	Practicing Different Types of OAE Tests
Week 12	Tympanometry	Tympanometry Measurements and Interpretation
Week 13	VRA (Visual Reinforcement Audiometry)	Conducting VRA with Pediatric Patients
Week 14	Word Intelligibility by Picture Identification	Practicing Word Intelligibility Testing with Pictures
Week 15	Evoked Response Audiometry	Conducting Evoked Response Audiometry (ABR)
Week 16	Audiological Tests, PTA	Performing PTA (Pure Tone Audiometry) and Interpreting Results

Textbooks and Reading Material

- Molina, P. E., & Molina, P. E. (2006). *Endocrine physiology*. New York: Lange Medical Books/McGraw-Hill.
- Hall, J. E., & Hall, M. E. (2020). *Guyton and Hall textbook of medical physiology e-Book*. Elsevier Health Sciences.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-311	Credit Hours	3(2+1)
Course Title	Medical Imaging Studies for Audiologists				

Course Introduction

The "Medical Imaging Studies for Audiologists" course is designed to provide audiologists with an in-depth understanding of medical imaging techniques used to assess auditory and vestibular disorders. This course will equip audiologists with the knowledge and practical skills needed to interpret various imaging modalities and collaborate effectively with medical professionals, such as radiologists and otolaryngologists, to improve patient outcomes in the diagnosis and management of hearing and balance disorders.

Learning Outcomes

On the completion of the course, the students will:

- **Understand Key Imaging Modalities**: Demonstrate a comprehensive understanding of medical imaging techniques, including CT scans, MRI, and X-rays, and their application in evaluating auditory and vestibular systems.
- **Interpret Medical Imaging**: Interpret and analyze common imaging findings related to auditory and vestibular disorders, including lesions, abnormalities, and anatomical variations.
- **Collaborate with Medical Professionals**: Develop the skills necessary to effectively communicate and collaborate with radiologists, otolaryngologists, and other healthcare providers to enhance multidisciplinary care.
- **Identify Clinical Relevance**: Recognize the clinical significance of imaging studies in the context of hearing loss, balance disorders, and other otologic conditions.
- **Integrate Imaging in Patient Management**: Apply imaging findings to inform the audiological assessment, diagnosis, and management plan, contributing to holistic patient care.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Medical Imaging in Audiology: Overview and Importance	Read the provided handout on "Introduction to Imaging in Audiology".
	X-ray Findings of the Cranium and Ear: Basics and Interpretation	Assignment: Identify common cranium and ear X-ray findings from sample images.
Week 2	X-ray Findings of the Cranium and Ear: Pathological Conditions	Assignment: Review X-ray images of the ear and cranium with pathologies.
	CT Scan and MRI of the Brain and Spinal Cord: Basics of Imaging Techniques	Assignment: Compare CT and MRI imaging methods for the brain.
Week 3	CT and MRI Investigations of the Brain: Normal and Abnormal Findings	Assignment: Interpret CT/MRI brain images for normal and abnormal conditions.
	CT and MRI Investigations of the Spinal Cord: Indications and Findings	Assignment: Analyze spinal cord pathologies in CT/MRI images.
Week 4	Imaging of Cerebrovascular Accidents (CVA): Focus on Middle Cerebral Artery	Assignment: Identify ischemic lesions in MCA territory from CT/MRI scans.
	Imaging Investigation of CVA: Diagnosis and Differential Diagnosis	Assignment: Interpret images from stroke patients, focusing on location and type.
Week 5	Lesion Sites in Different Aphasia Types: Conduction, Broca's, Wernicke's	Assignment: Map lesion sites for different aphasia types based on brain imaging.
	Aphasia: Transcortical Sensory, Transcortical Motor, and Mixed Aphasia	Assignment: Identify lesion sites for transcortical and mixed aphasia

		cases.
Week 6	Imaging of Traumatic Brain Injury: Techniques and Findings	Assignment: Review CT/MRI images for traumatic brain injury.
	Imaging of Hydrocephalus, Tumors, Encephalitis, Meningitis, and Other Pathologies	Assignment: Review and interpret CT/MRI images for these conditions.
Week 7	Abnormal Findings in Brain and Ear Imaging: Pathophysiology and Diagnosis	Assignment: Analyze pathological findings in CT/MRI and X-ray images.
	Imaging Investigation for Cochlear Implant Surgery: HPICT, Temporal Bone MRI	Assignment: Study pre-surgical imaging for cochlear implantation.
Week 8	Temporal Bone MRI and Auditory Cortex Imaging in Cochlear Implant Surgery	Assignment: Review auditory cortex imaging for cochlear implant candidates.
	Review and Integration: Imaging Techniques in Audiology and Clinical Application	Assignment: Prepare a case report integrating imaging findings with audiological diagnosis.
Week 9	Principles of X-ray Imaging: Exposure, Contrast, and Resolution	Assignment: Study basic X-ray principles and exposure factors.
	Advanced CT Techniques: Multislice CT, Functional Imaging	Assignment: Compare traditional and advanced CT imaging techniques.
Week 10	MRI Principles: Magnetic Resonance, Gradient Fields, and Safety	Assignment: Review the basic principles of MRI and safety protocols.
	Imaging Modalities in Neurodegenerative Diseases	Assignment: Review MRI and CT imaging of Alzheimer's and Parkinson's disease.
Week 11	Vascular Imaging: CTA and MRA in Brain and Spinal Cord Imaging	Assignment: Study case studies involving vascular imaging for brain and spinal cord.
	Imaging of Brain Tumors: Primary and Metastatic Types	Assignment: Interpret CT/MRI images of brain tumors and lesions.
Week 12	Pediatric Neuroimaging: Unique Considerations and Challenges	Assignment: Study neuroimaging in pediatric populations.
	Imaging of Central Auditory Pathways: Techniques and Applications	Assignment: Review MRI scans of the auditory pathways in normal and pathological cases.
Week 13	Functional Imaging: fMRI and PET in Brain Function Assessment	Assignment: Compare functional MRI and PET imaging techniques in brain function studies.
	Imaging in Epilepsy: Identifying Seizure Foci and Lesions	Assignment: Analyze MRI images of seizure foci in epilepsy cases.
Week 14	Postoperative Imaging in Neurosurgery: Assessing Outcomes	Assignment: Review post-surgical imaging cases of brain and spine surgery.
	Imaging of Degenerative Hearing Loss: Otoacoustic Emissions, CT, and MRI	Assignment: Study imaging techniques for degenerative hearing loss.
Week 15	Cochlear Implantation: Preoperative Imaging and Postoperative Evaluation	Assignment: Prepare a report on pre- and post-operative imaging of cochlear implantation.

	Magnetic Resonance Spectroscopy (MRS): Techniques and Clinical Applications	Assignment: Study the use of MRS in diagnosing brain tumors and other pathologies.
Week 16	Advanced MRI Techniques: Diffusion Tensor Imaging (DTI) and Perfusion Imaging	Assignment: Review the clinical use of DTI and perfusion MRI in stroke and brain injury.
	Final Review and Integration of Imaging Techniques in Audiology	Assignment: Prepare a comprehensive case study integrating various imaging modalities.
Course Content (Lab)		**Assignments/Readings**
Week 1	Introduction to Medical Imaging Equipment: X-ray, CT, MRI	Practical: Familiarization with X-ray, CT, and MRI machines.
Week 2	Hands-on Training: X-ray Interpretation of Cranium and Ear	Practical: Analyze X-ray images of cranium and ear.
Week 3	CT Scan Demonstration: Brain Imaging Basics	Practical: Observe CT scans of normal brain structures.
Week 4	MRI Demonstration: Brain and Spinal Cord Imaging	Practical: Observe MRI scans of brain and spinal cord.
Week 5	CT and MRI Scan Comparison: Normal and Abnormal Brain Findings	Practical: Compare normal and abnormal brain CT/MRI scans.
Week 6	CT and MRI Scan Comparison: Spinal Cord Findings	Practical: Analyze CT/MRI scans for spinal cord abnormalities.
Week 7	Stroke Imaging: Middle Cerebral Artery on CT and MRI	Practical: Interpret CT/MRI scans showing stroke in MCA region.
Week 8	Aphasia: Lesion Localization on CT and MRI for Different Aphasia Types	Practical: Identify lesions in aphasia cases from brain scans.
Week 9	Brain Injury Imaging: CT and MRI of Traumatic Brain Injuries	Practical: Study CT/MRI images of traumatic brain injuries.
Week 10	Imaging of Hydrocephalus and Tumors on CT and MRI	Practical: Analyze CT/MRI scans showing hydrocephalus and brain tumors.
Week 11	Encephalitis and Meningitis Imaging on CT/MRI	Practical: Review CT/MRI images for encephalitis and meningitis.
Week 12	Review of Abnormal Findings in Brain and Ear Imaging	Practical: Hands-on practice identifying pathologies from images.
Week 13	Pre-surgical Cochlear Implant Imaging: HPICT and Temporal Bone MRI	Practical: Review pre-surgical HPICT and Temporal Bone MRI images.
Week 14	Auditory Cortex Imaging for Cochlear Implantation	Practical: Study auditory cortex imaging in cochlear implant candidates.
Week 15	Case Study Review: Integrating Imaging Findings in Audiological Diagnosis	Practical: Prepare a case study based on imaging findings.
Week 16	Final Review and Practical Integration of Imaging Techniques	Practical: Demonstrate integrated knowledge of imaging techniques.

Textbooks and Reading Material

- Rossing, T. D. (2014). Introduction to acoustics. Springer handbook of acoustics, 1-7.
- Saltarrelli, M. L. (2008). Review of medical imaging devices for the integration of medical technology and earmold production and grant proposal development. Louisiana Tech University.

Teaching Learning Strategies

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  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
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Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-312	Credit Hours	3 (2+1)
Course Title	Balance Assessment - II				

Course Introduction

This course focuses on the accurate assessment of balance abilities and the identification of fall risks in the elderly. It emphasizes the importance of a skilled clinician to guide and assist individuals throughout the process of scoring an appropriate balance assessment method. In this course, students will learn about the concept of body balance, how the body maintains balance, and how to assess balance. They will also explore balance disorders, how they are diagnosed, and the concept of body equilibrium. Additionally, the course will cover the advantages and disadvantages of various balance tests and the specific tests used to assess balance disorders.

Learning Outcomes

On the completion of the course, the students will:

- **Understand the Concept of Body Balance:** Students will gain a clear understanding of body balance, its importance, and the physiological mechanisms involved in maintaining balance.
- **Assess Balance Abilities:** Students will learn how to assess an individual's balance abilities using appropriate methods and techniques.
- **Identify and Understand Balance Disorders:** Students will be able to recognize and understand various balance disorders and how they affect individuals, particularly the elderly.
- **Evaluate Body Equilibrium:** Students will acquire the skills to assess body equilibrium and determine its role in maintaining overall stability.
- **Select and Apply Balance Tests:** Students will learn about different balance tests, their advantages and disadvantages, and how to choose and apply the most suitable tests for diagnosing balance disorders.

Course Content (Theory)		Assignments/Readings
Week 1	Patient history preset preparation	Readings on patient history assessment in vestibular disorders
	Eye movement and vestibular evaluation	Study material on eye movement types and their relation to vestibular function
Week 2	Electronystagmography & video nystagmography	Article on principles and differences between ENG and VNG
	Advantages and disadvantages of video nystagmography	Prepare a comparison chart for VNG pros and cons
Week 3	Spontaneous nystagmus	Research on causes and diagnostic relevance of spontaneous nystagmus
	Saccade test	Review article on the saccade test and its clinical significance
Week 4	Smooth pursuit test	Read about smooth pursuit eye movements and their role in vestibular evaluation
	Optokinetic test	Study material on the optokinetic test in the diagnosis of vestibular disorders
Week 5	Gaze test	Research on the gaze test and its clinical applications
	Headshake test	Prepare a detailed explanation on the headshake test protocol
Week 6	Modified Dix-Hallpike Positioning Test	Study on the Dix-Hallpike test and its role in diagnosing BPPV

	Positional nystagmus tests	Read about positional tests and their diagnostic significance
Week 7	Biothermal caloric tests	Review article on the principles and techniques of caloric testing
	Vestibular evoked myogenic potentials – Patient preparation protocols	Research on VEMP testing and preparation guidelines
Week 8	Dynamic visual acuity tests	Read about the impact of dynamic visual acuity on balance assessment
	Advantages and disadvantages of dynamic visual acuity tests	Prepare a report on the pros and cons of dynamic visual acuity testing
Week 9	Vestibular autorotation test	Review study material on the vestibular autorotation test protocol
	Patient preparation and test protocol for vestibular autorotation test	Study guidelines on patient preparation for vestibular testing
Week 10	Advantages and disadvantages of vestibular autorotation test	Prepare a summary on the strengths and limitations of this test
	Sinusoidal harmonic acceleration test	Review of SHAT and its diagnostic uses in vestibular disorders
Week 11	Advantages & disadvantages of sinusoidal harmonic acceleration test	Prepare a comparative analysis of SHAT benefits and drawbacks
	Computerized Dynamic Platform Posturography	Study article on the principles and technology behind CDP posturography
Week 12	Sensory organization test	Research on the Sensory Organization Test and its clinical relevance
	Motor control test	Study motor control testing techniques in balance assessment
Week 13	Interpretation of computerized dynamic platform posturography	Prepare a report on interpreting CDP posturography results
	Review of all topics	Prepare notes for comprehensive review of balance assessment methods
Week 14	Review of all topics	Complete a case study based on balance assessment techniques
	Practical application of test protocols	Prepare to demonstrate key balance assessment techniques in class
Week 15	Practical application of test protocols	Complete a case scenario report of balance testing process
	Case study analysis	Prepare and present a case study on balance assessment and management
Week 16	Case study analysis	Complete a final project based on a real-life balance disorder case
	Final review and conclusion	Prepare final presentation and submit course feedback
Course Content (Lab)		**Assignments/Readings**
Week 1	Patient history preset preparation	Demonstration of patient history assessment
Week 2	Eye movement and vestibular evaluation	Perform and analyze eye movement tests in a clinical setting

Week 3	Electronystagmography & video nystagmography	Hands-on practice with ENG and VNG equipment
Week 4	Advantages and disadvantages of video nystagmography	Practice interpreting VNG results and understanding limitations
Week 5	Spontaneous nystagmus	Practical assessment of spontaneous nystagmus using clinical tools
Week 6	Saccade test	Perform saccade testing and analyze results
Week 7	Smooth pursuit test	Conduct and evaluate smooth pursuit eye movements
Week 8	Optokinetic test	Perform optokinetic testing with video stimuli
Week 9	Gaze test	Practical demonstration of the gaze test and interpretation
Week 10	Headshake test	Practice the headshake test and interpret outcomes
Week 11	Modified Dix-Hallpike Positioning Test	Perform the Dix-Hallpike test and document findings
Week 12	Positional nystagmus tests	Demonstrate and analyze positional nystagmus tests
Week 13	Biothermal caloric tests	Hands-on practice with caloric testing procedure
Week 14	Vestibular evoked myogenic potentials – Patient preparation Protocols	Practical experience in preparing patients for VEMP testing
Week 15	Dynamic visual acuity tests	Conduct dynamic visual acuity tests and evaluate results
Week 16	Vestibular autorotation test	Demonstrate the vestibular autorotation test protocol

Textbooks and Reading Material

- Shepard, J. (2013). Balance and stability: A sports medicine approach. CRC Press.
- Horak, F. B. (1996). Handbook of physiology, Section 12: Exercise: Regulation and integration of multiple systems. (No Title), 255.

Teaching Learning Strategies

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- **Collaborative Learning**
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- **Case Studies**
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- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation

- Professional Writing Assignments

Assessment

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1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	**Audiology**	**Course Code**	**AUD-401**	**Credit Hours**	3(2+1)
Course Title	Hearing Aids				

Course Introduction

The "Introduction to Hearing Aids" course offers a comprehensive foundation in the principles, technologies, and applications of hearing aids. Designed for students seeking to understand the essential aspects of hearing aid functioning, types, and maintenance, this course aims to equip learners with the knowledge and skills required to assist individuals with hearing impairments effectively.

Learning Outcomes

On the completion of the course, the students will:

- Understand the fundamental principles of hearing and how hearing aids enhance auditory perception.
- Identify and compare different types of hearing aids, their components, and how each type addresses specific hearing needs.
- Gain knowledge of advanced technologies used in hearing aids, including digital signal processing, noise reduction, and wireless connectivity.
- Acquire practical skills in fitting, adjusting, and troubleshooting hearing aids to ensure optimal performance for users.
- Demonstrate competence in the maintenance and care of hearing aids, and effectively educate individuals on proper usage and upkeep.

Course Content (Theory)		**Assignments/Readings**
Week 1	Introduction to Hearing Aids; Historical Development of Hearing Aids	Read on the history of hearing aids; Assignment on early developments in hearing aid technology
	Components of Hearing Aids; Classification and Types of Hearing Aids	Read on the components of hearing aids; Assignment on the types and classifications of hearing aids
Week 2	Styles of Hearing Aids; Amplification Devices	Read on different styles of hearing aids; Assignment on comparing amplification devices
	Assistive Listening Devices	Read on assistive listening devices; Assignment on the uses and benefits of assistive listening devices
Week 3	Head Shadow Effect; Output Limiting: Peak Clipping, Compression	Read on head shadow effect and output limiting; Assignment on

		peak clipping vs compression in hearing aids
	Real Ear Measurement (REM) and Couplers	Read on real ear measurement and couplers; Assignment on the application of REM in hearing aid fitting
Week 4	Hearing Aid Technology	Read on the latest advancements in hearing aid technology; Assignment on emerging technologies in hearing aids
	Evaluation of Hearing Aids; Hearing Aid Test Box	Read on hearing aid evaluation techniques; Assignment on using a hearing aid test box
Week 5	Real Ear Measurement and Speaker Recognition System	Read on real ear measurement systems; Assignment on speech recognition systems and their role in hearing aid evaluation
	Speech Recognition Systems; Hearing Aid Protocol	Read on speech recognition systems; Assignment on protocols in hearing aid dispensing
Week 6	Hearing Aid Selection; Pre-selection Factors: Which Ear to Fit?	Read on hearing aid selection; Assignment on pre-selection factors for hearing aid fitting
	Hearing Aid Dispensing; Ear Molds Types (Hard and Soft Molds)	Read on hearing aid dispensing; Assignment on the types of ear molds and their fitting
Week 7	Making of Ear Mold; Types and Styles of Ear Molds	Read on ear mold production; Assignment on various ear mold styles and materials
	Criteria for Ear Mold Selection (Vent, Dampers)	Read on criteria for ear mold selection; Assignment on selecting the right ear mold for specific cases
Week 8	Pure Tone Audiometry; MCL and UCL in Audiometry	Read on pure tone audiometry; Assignment on measuring MCL and UCL
	Speech Audiometry; MCL, UCL in Speech Audiometry	Read on speech audiometry; Assignment on determining MCL and UCL in speech tests
Week 9	Troubleshooting of Hearing Aids	Read on troubleshooting techniques for hearing aids; Assignment on common issues with hearing aids and their solutions
	Testing Hearing Aids	Read on methods to test hearing aids; Assignment on evaluating hearing aid performance
Week 10	Hearing Aid Fitting for Children	Read on pediatric hearing aid fitting; Assignment on challenges in fitting hearing aids for children
	Hearing Aid Fitting for Adults	Read on adult hearing aid fitting; Assignment on considerations for adult fitting
Week 11	Hearing Aid Fitting Verification and Validation	Read on fitting verification and validation; Assignment on methods

		to verify and validate hearing aid fitting
	Hearing Aid Programming; Accessories and Programming	Read on hearing aid programming; Assignment on accessories used in hearing aid programming
Week 12	Articulation Index	Read on articulation index; Assignment on calculating and interpreting articulation index
	Implantable Hearing Devices: BAHA	Read on Bone Anchored Hearing Aids (BAHA); Assignment on indications and fitting of BAHA
Week 13	Middle Ear Implants	Read on middle ear implants; Assignment on different types of middle ear implants
	Cochlear Implants	Read on cochlear implants; Assignment on the process of cochlear implant fitting
Week 14	Auditory Brainstem Implants	Read on auditory brainstem implants; Assignment on the selection criteria for auditory brainstem implants
	Batteries for Hearing Aids; Battery Life	Read on hearing aid batteries; Assignment on battery selection and maintenance
Week 15	Battery Types; Rechargeable Hearing Aids	Read on different battery types; Assignment on the advantages of rechargeable hearing aids
	Maintenance of Hearing Aids	Read on hearing aid maintenance; Assignment on routine care and cleaning of hearing aids
Week 16	Tinnitus Maskers	Read on tinnitus maskers; Assignment on the role of tinnitus maskers in hearing aid therapy
	Review and Final Assessment	Review material from all topics; Final assignment on comprehensive hearing aid fitting and troubleshooting
Course Content (Lab)		**Assignments/Readings**
Week 1	Introduction to Hearing Aids; Historical Development of Hearing Aids	Demonstration of different hearing aids and their evolution; Practical discussion on early hearing aids
Week 2	Components of Hearing Aids; Classification and Types of Hearing Aids	Hands-on identification and categorization of hearing aid components; Exploring different types and classifications of hearing aids
Week 3	Styles of Hearing Aids; Amplification Devices	Practical exercise on fitting different styles of hearing aids; Demonstrating the use of amplification devices
Week 4	Assistive Listening Devices	Hands-on trial of assistive listening devices; Practical exercise on fitting and using devices in various

		environments
Week 5	Head Shadow Effect; Output Limiting: Peak Clipping, Compression	Demonstrating the head shadow effect with real-time testing; Hands-on experience with peak clipping and compression settings on hearing aids
Week 6	Real Ear Measurement (REM) and Couplers	Using REM equipment for measurement; Practical demonstration of how to use couplers in testing hearing aids
Week 7	Hearing Aid Technology	Hands-on session with the latest hearing aid technologies; Practical demonstration of advanced hearing aid features
Week 8	Evaluation of Hearing Aids; Hearing Aid Test Box	Practical use of a hearing aid test box to evaluate hearing aids; Simulating real-world testing of hearing aids
Week 9	Real Ear Measurement and Speaker Recognition System	Hands-on measurement using REM systems; Practical demonstration of speech recognition systems for hearing aid evaluation
Week 10	Hearing Aid Protocol; Hearing Aid Selection	Practical experience with hearing aid selection protocol; Hands-on exercise in selecting the right hearing aid for a patient
Week 11	Pre-selection Factors: Which Ear to Fit?; Hearing Aid Dispensing	Practical discussion and demonstration of pre-selection factors; Hands-on fitting of hearing aids for both ears
Week 12	Ear Molds: Types (Hard and Soft); Making of Ear Molds	Demonstrating the process of making custom ear molds; Practical fitting of hard and soft ear molds
Week 13	Types and Styles of Ear Molds; Criteria for Ear Mold Selection (Vent, Dampers)	Hands-on exercise in selecting and fitting ear molds based on different styles and patient needs
Week 14	Pure Tone Audiometry; MCL and UCL in Audiometry	Practical demonstration of pure tone audiometry; Hands-on measuring of MCL and UCL for different frequencies
Week 15	Troubleshooting of Hearing Aids; Testing Hearing Aids	Practical troubleshooting of common hearing aid issues; Hands-on testing of hearing aids for optimal performance
Week 16	Hearing Aid Fitting for Children and Adults; Hearing Aid Programming	Hands-on fitting of hearing aids for children and adults; Demonstrating hearing aid programming and adjustments for different users
Textbooks and Reading Material		
• Rossing, T. D. (2014). Introduction to acoustics. Springer handbook of acoustics, 1-7. • Saltarrelli, M. L. (2008). Review of medical imaging devices for the integration of medical technology and earmold production and grant proposal development. Louisiana Tech University.		

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Assignments: Types and Number with Calendar

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- Quiz-II
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- Professional Writing Assignments

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Programme	Audiology	Course Code	AUD-402	Credit Hours	3(2+1)
Course Title	Diagnostic Audiology II				

Course Introduction

Diagnostic Audiology is a comprehensive course designed to equip students with a thorough understanding of the principles, techniques, and practices used in the assessment and diagnosis of auditory disorders. The course covers both the theoretical foundations and practical applications of audiological assessment, preparing students to evaluate and diagnose hearing impairments in individuals of all age groups. Emphasis is placed on the development of skills required for administering various audiological tests, interpreting results, and understanding the impact of hearing disorders on communication and quality of life.

Learning Outcomes

On the completion of the course, the students will:

- **Understand the fundamentals of auditory anatomy and physiology** as it relates to hearing assessments and disorders.
- **Demonstrate proficiency in conducting a range of audiological tests**, including pure tone audiometry, speech audiometry, tympanometry, and auditory brainstem response (ABR) testing.
- **Interpret audiological test results** to assess the presence, type, and degree of hearing impairments.
- **Apply knowledge of hearing disorders** to diagnose conditions affecting hearing, such as sensorineural, conductive, and mixed hearing loss.
- **Understand the impact of hearing impairments** on individuals' communication abilities and overall quality of life.
- **Utilize specialized diagnostic tools** such as tympanometers, otoacoustic emissions (OAE) devices, and ABR equipment in clinical settings.
- **Communicate diagnostic findings effectively** to patients and other healthcare professionals.
- **Demonstrate competence in working with diverse populations**, including children, adults, and the elderly, while understanding the unique challenges in diagnosing hearing loss at different ages.
- **Develop critical thinking and problem-solving skills** to approach complex auditory cases and make informed decisions in audiological diagnosis.

Course Content (Theory)		Assignments/Readings
Week 1	Electrocochleography	Read article on Electrocochleography techniques and clinical applications
	Auditory Brainstem Responses (ABR)	Research paper on ABR and its clinical significance
Week 2	Evoked Response Audiometry: Early Response	Review article on Evoked Response Audiometry techniques
	MLR (Middle Latency Response), LLR (Long Latency Response)	Research paper on the clinical applications of MLR and LLR
Week 3	Mismatch Negativity	Study article on mismatch negativity in auditory processing
	Discriminatory and Obligatory Cortical Potentials	Review article on cortical potentials and their clinical relevance
Week 4	Acoustic Reflectance: Principles and Application	Research on acoustic reflectance and instrumentation
	Instrumentation and Calibration of Acoustic Reflectance	Study techniques for calibration in auditory testing
Week 5	Test Procedures for Acoustic Reflectance	Research on the correlation of acoustic reflectance with clinical disorders
	Interpretation of Acoustic Reflectance	Study materials on factors affecting

		ERR and calibration issues
Week 6	Correlation with FMRI, PET in Auditory Evoked Responses	Review article on the role of FMRI and PET in auditory testing
	Electrical ABR and Clinical Disorders	Study clinical implications of electrical ABR
Week 7	MLRs and LLR: Generators, Principles of Recording	Research on the factors affecting MLR and LLR interpretation
	Group Testing: Mass Hearing Screening and Automatic Audiometry	Study on the relevance and effectiveness of group testing
Week 8	Electrophysiological Tests: Reporting Test Results	Read on how to report and interpret electrophysiological test results
	Central Auditory Processing Disorder (CAPD): Definition, Terminologies, Causes	Research on the definition and causes of CAPD
Week 9	Indications for Administering CAPD Tests	Study the rationale and indications for CAPD testing
	Tests for CAPD: Masking Level, Pitch Pattern Test	Research paper on various CAPD diagnostic tests
Week 10	Binaural Beats, Filtered Speech Test	Review article on binaural beats and their clinical significance
	Dichotic Binaural Fusion Time Altered Speech Test	Study materials on dichotic tests in CAPD diagnosis
Week 11	Rapidly Alternating Speech Test	Research on the clinical importance of rapid speech tests
	Dichotic Digit Test, Dichotic Consonant-Vowel Test	Study on dichotic tests for central auditory processing
Week 12	Speech in Noise Test	Review article on speech in noise testing for CAPD diagnosis
	Clinical Management of Tinnitus and Auditory Neuropathy	Research on the management of auditory neuropathy and tinnitus
Week 13	Acoustic Shock, Non-Organic Hearing Loss	Study materials on diagnosing and managing non-organic hearing loss
	Noise-Induced Hearing Loss	Research on the clinical management of noise-induced hearing loss
Week 14	Tests for Pseudohypacusis: Lombard Test	Research on tests for diagnosing pseudohypacusis
	Indications for Behavioral and Test Results in Pseudohypacusis	Review article on protocol and test procedures for pseudohypacusis
Week 15	Protocol of Test Procedures for Pseudohypacusis	Study the protocols for pseudohypacusis testing
	PAM (Physiological Acoustical Measurements) and Applications	Review article on PAM and its role in auditory tests
Week 16	Correlation with FMRI and PET in Clinical Disorders	Research on fMRI and PET correlations in auditory disorders
	Electrical LLR and Clinical Disorders	Study article on electrical LLR in clinical practice
Course Content (Lab)		**Assignments/Readings**
Week 1	Electrocochleography	Conduct Electrocochleography test on model subjects
Week 2	Auditory Brainstem Responses (ABR)	Practice ABR testing and analysis of responses

Week 3	Evoked Response Audiometry: Early Response	Perform early response audiometry on test subjects
Week 4	MLR (Middle Latency Response)	Measure and analyze MLR in clinical settings
Week 5	LLR (Long Latency Response)	Conduct LLR tests and interpret results
Week 6	Mismatch Negativity	Perform tests to measure mismatch negativity
Week 7	Discriminatory and Obligatory Cortical Potentials	Practice recording cortical potentials in different conditions
Week 8	Acoustic Reflectance Testing	Perform acoustic reflectance testing and evaluate data
Week 9	Instrumentation Calibration for Acoustic Tests	Calibrate equipment and perform acoustic reflectance testing
Week 10	Test Procedures for Acoustic Reflectance	Perform clinical procedures for acoustic reflectance testing
Week 11	ABR and Clinical Disorders	Conduct ABR tests in clinical patients with different disorders
Week 12	Group Testing and Screening	Organize and execute group hearing screening
Week 13	Electrophysiological Tests and Reporting	Record and interpret electrophysiological tests results
Week 14	CAPD Testing: Masking Level, Pitch Pattern	Perform CAPD tests and analyze results for masking level and pitch pattern
Week 15	Dichotic Binaural Testing	Conduct dichotic binaural tests (dichotic digit and consonant-vowel)
Week 16	Pseudohypacusis Tests: Lombard Test	Perform pseudohypacusis testing using the Lombard test

Textbooks and Reading Material

- Dhingra, P. L., & Dhingra, S. (2013). *Diseases of Ear, Nose and Throat-E-Book*. Elsevier Health Sciences.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II

- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-403	Credit Hours	2(0+2)
Course Title	Advance Clinical Audiology				

Course Introduction

This course provides in-depth knowledge and practical skills for examining hearing loss and related auditory issues in babies, toddlers, children, and teens. It covers the methods and techniques for performing hearing tests, interpreting results, and determining the presence, extent, and underlying causes of hearing loss across different age groups. Students will learn how to administer various assessments, utilize appropriate diagnostic tools, and interpret findings to inform treatment and intervention plans.

Learning Outcomes

On the completion of the course, the students will:

- **Identify and understand the different types and causes of hearing loss** in pediatric populations, including congenital, acquired, and genetic factors.
- **Conduct comprehensive hearing assessments** for babies, toddlers, children, and teens, utilizing age-appropriate testing methods such as otoacoustic emissions (OAEs), auditory brainstem response (ABR), and pure-tone audiometry.
- **Analyze and interpret hearing test results** to determine the presence, extent, and nature (sensorineural, conductive, or mixed) of hearing loss.
- **Recognize early signs and symptoms of hearing loss** in young children and effectively use diagnostic tools to detect hearing impairment at different developmental stages.
- **Develop intervention and referral strategies** based on assessment findings, collaborating with multidisciplinary teams to support hearing rehabilitation and communication development in pediatric patients.

Course Content (Lab)		Assignments/Readings
Week 1	Introduction to Clinical Audiology; Case History Taking from Clients/Caregivers	Assisting supervisor with preset interview; Post-test counseling under supervision (at least 5 cases)
	Overview of Audiology Instruments; AC/BC/Sound Field Testing	Identifying different types of audiometers and their accessories; Observing instrument calibration
Week 2	Pure Tone Audiometry: Testing Procedure and Interpretation	Undergoing pure tone audiometry (AC & BC); Plotting audiograms (at least 5 cases)
	Speech Audiometry: Types and Techniques	Conducting speech audiometry and analyzing results; Interpretation of speech audiogram (at least 5 cases)
Week 3	Immittance Audiometry: Tympanometry & Acoustic Reflex Testing (Ipsi & Contra)	Performing immittance audiometry, tympanometry, and acoustic reflex tests (at least 5 cases)
	Pediatric Audiological Assessment: Informal Screening	Informal screening (using noisemakers, spectral characteristics, procedures); Testing 5 normal hearing & 5 hearing-impaired children
Week 4	Pediatric Audiological Assessment: BOA and VRA	Performing behavioral observation audiometry (BOA) & visual reinforcement audiometry (VRA) for pediatric patients
	Play Audiometry Techniques	Conducting play audiometry (at least 5 cases)

Week 5	Advanced Audiological Evaluation Techniques	Observing and participating in audiological evaluations on a variety of cases under supervision
	Audiogram Plotting & Analysis	Plotting audiograms for AC and BC; Calculating interaural attenuation and occlusion effect (at least 5 cases)
Week 6	Obtaining Audiograms Independently	Conducting pure tone audiometry and obtaining audiograms independently (at least 5 cases with AC & BC)
	Audiometry with Masking	Performing audiometry with masking (at least 5 cases)
Week 7	Classification of Hearing Loss	Classifying audiograms based on the nature of hearing loss (at least 5 cases)
	Degree of Hearing Loss & Contour of Audiogram	Identifying and interpreting the degree of hearing loss and contour of audiograms (at least 5 cases)
Week 8	Audiometer Calibration and Equipment Maintenance	Demonstrating calibration of audiometers and ensuring proper functionality
	Combination of Equipment for Calibration	Using multiple audiology equipment for calibration and testing procedures
Week 9	Preparing and Maintaining Correction Charts	Preparing correction charts for audiometric testing
	Otoscopic Screening and Ear Mold Impressions	Performing otoscopic screenings prior to tympanometry and ear mold impressions (at least 5 cases)
Week 10	Review of Pediatric Audiological Assessment	Re-evaluating pediatric audiological assessment techniques: BOA, VRA, Play Audiometry
	Advanced Audiometry in Adults	Conducting advanced audiometric testing in adult patients (AC, BC, Speech Audiometry)
Week 11	Pediatric Audiology Reassessment and Case Discussion	Reassessing pediatric audiology cases, discussing complex case studies
	Masking Techniques in Audiometry	Practicing masking techniques for air and bone conduction audiometry (at least 5 cases)
Week 12	Interpretation of Complex Audiograms	Interpreting complex audiograms and identifying hearing loss patterns (at least 5 cases)
	Electrophysiological Testing (Optional)	Introduction to electrophysiological audiology tests (e.g., ABR, OAE) if applicable in the clinic
Week 13	Calibration and Equipment Troubleshooting	Demonstrating troubleshooting skills for audiometry and calibration issues
	Advanced Case History Taking	Taking comprehensive case histories from clients/caregivers (at least 5 independent cases)

Week 14	Audiometry for Special Populations	Conducting audiometry for special populations (e.g., elderly, cochlear implants)
	Tympanometry and Acoustic Reflex Testing (Advanced)	Advanced techniques for tympanometry and acoustic reflex testing, analysis of results
Week 15	Advanced Speech Audiometry Techniques	Conducting advanced speech audiometry tests for various hearing loss profiles
	Pediatric Audiology Follow-up and Case Review	Reviewing and analyzing pediatric audiology cases (at least 5 cases)
Week 16	Final Practicum and Evaluation Preparation	Practicum for performing independent audiological evaluations and preparing for final assessment
	Final Review and Assessment	Final exam or assessment, discussing practical experience and cases handled independently

Textbooks and Reading Material

- Netter, F. H. (2022). *Netter Atlas of Human Anatomy: A Systems Approach-E-Book: paperback+ eBook*. Elsevier Health Sciences.
- Klein, J. S., Brant, W. E., Helms, C. A., & Vinson, E. N. (2012). Fundamentals of diagnostic radiology. *(No Title)*

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.

2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-404	Credit Hours	3 (3+0)
Course Title	Advance Audiological Rehabilitation				

Course Introduction

This course focuses on enhancing the quality of life by developing life management skills, fostering a sense of direction for the future, and rebuilding resilience through improved social connectedness with family and community. It provides foundational knowledge and skills in audiological rehabilitation for both children and adults. The course includes practical observation and education on working with individuals with hearing impairments, as well as exploring educational strategies and alternative approaches for supporting those with hearing loss.

Learning Outcomes

On the completion of the course, the students will:

- **Demonstrate Effective Life Management**: Apply life management skills to enhance personal well-being and effectively navigate various life challenges.
- **Develop a Clear Sense of Direction**: Create actionable plans for the future, setting personal and professional goals that foster long-term success.
- **Strengthen Social Connections**: Rebuild and maintain strong relationships with family, peers, and community, fostering emotional resilience and social support.
- **Apply Audiological Rehabilitation Techniques**: Utilize basic knowledge and skills in audiological rehabilitation for both children and adults with hearing impairments.
- **Implement Educational Strategies for Hearing Impairment**: Design and apply effective educational methods and alternative approaches to support individuals with hearing loss.

Course Content (Theory)		Assignments/Readings
Week 1	Non-audiometric assessment: Disability vs Handicap	Reading on Disability vs Handicap definitions
	Measurement of intelligence	Case study on intelligence assessment in hearing-impaired individuals
	Communication needs: Language development & Communication philosophy	Readings on language development theories
Week 2	Career controversy & Counseling children and parents	Reading on career options for individuals with hearing impairments
	Psychosocial variables affecting the hearing impaired	Article review on psychosocial challenges
	Vocational variables for hearing-impaired individuals	Research paper on vocational training programs for the hearing impaired
Week 3	Deaf persons with secondary disabilities	Reading on secondary disabilities in the deaf population
	Group training techniques	Discussion on group training models for rehabilitation
	Speech reading: Definitions & Importance	Research on speech reading techniques and strategies
Week 4	Communicative strategies: Anticipated and repair strategies	Prepare a list of communication strategies for hearing-impaired individuals

	Counseling and team approach in aural rehabilitation	Article review on counseling strategies and team-based approaches
	Tinnitus management in audiological rehabilitation	Reading on tinnitus management techniques and therapies
Week 5	Vestibular management in audiology	Case study on vestibular issues and rehabilitation
	Sensory Integration therapy in hearing rehabilitation	Research paper on Sensory Integration therapy for hearing impaired individuals
	Role of Occupational therapy in hearing rehabilitation	Article on the role of Occupational therapy in sensory disabilities
Week 6	Team approach for managing hearing-impaired with special needs	Group presentation on interdisciplinary team approaches
	Management of multi-handicapped hearing impaired individuals	Case study on multi-handicapped hearing-impaired individuals
	Management of Central Auditory Processing Disorders	Reading on strategies for managing CAPD in children and adults
Week 7	Auditory training: Definitions & Historical background	Review of the history of auditory training
	Methods of auditory training: Analytical vs Synthetic	Prepare a report on different auditory training methods
	Auditory training for patients with congenital and acquired hearing losses	Research on auditory training for congenital vs acquired hearing loss
Week 8	Verbal vs non-verbal material in auditory training	Practice creating verbal and non-verbal auditory training materials
	Individual vs group auditory training activities	Reading on benefits of individual vs group training sessions
	Auditory learning and its role in speech & language development	Research on the role of auditory input in speech development
Week 9	Factors influencing auditory training for hearing-impaired children	Article on how different factors affect auditory learning
	Communication strategies: Anticipated and repair strategies	Discuss communication strategies and their effectiveness in practice
	Speech reading: Need for those with hearing aids, tactile devices, cochlear implants	Case study on the role of speech reading for hearing aid and cochlear implant users
Week 10	Speech reading: For individuals without sensory aids, children, and adults	Review on speech reading strategies for non-users of sensory aids
	Visual perception of speech: Audiovisual vs visual perception	Prepare an essay on the differences between audiovisual and visual perception
	Tests for speech reading ability: Denver, John Tracy, Utlay, etc.	Practice administering speech reading tests
Week 11	Factors influencing speech reading: Speech reader, Speaker, Environment	Research paper on the factors that affect speech reading accuracy
	Educational audiology: Education as a goal of aural rehabilitation	Reading on the role of education in aural rehabilitation

	Methods of teaching language, speech reading, and listening	Create a lesson plan for teaching speech reading
Week 12	Verbal vs non-verbal communication approaches in education	Prepare a comparison of verbal and non-verbal teaching methods
	Classification of hearing handicap and its implications	Research on different classifications of hearing impairment
	Early identification of hearing impairment: Importance in aural rehabilitation	Case study on the importance of early identification in hearing loss
Week 13	Types of programs available for education of speech-hearing impaired individuals	Review of different educational programs for hearing-impaired children
	Educational problems of hard of hearing individuals in Pakistan	Research on the challenges faced by hearing-impaired students in Pakistan
	Unisensory vs multi-sensory approach in rehabilitation	Research on the pros and cons of unisensory vs multi-sensory approaches
Week 14	Acoupedic approach and its role in rehabilitation	Reading on the Acoupedic approach to auditory training
	Manual vs oral communication forms in hearing rehabilitation	Prepare a debate on the benefits of manual vs oral communication approaches
	Systems parallel to English: Manual alphabet, Cued speech, Rochester method	Create a guide to manual alphabet and cued speech systems
Week 15	Interactive systems: Cued speech, Indian sign language	Research on interactive systems for deaf individuals in India
	Communication systems alternative to English: ASL and Indian Sign Language	Prepare a report on ASL and Indian Sign Language for hearing-impaired individuals
	Management of hearing-impaired individuals with special needs	Case study on special needs management for hearing-impaired individuals
Week 16	Team approach in the management of hearing-impaired individuals	Presentation on team-based management for hearing-impaired individuals
	Vocational training for hearing-impaired individuals	Prepare a vocational training program for hearing-impaired adults
	Final review and group discussion on course concepts	Prepare for the final exam with group discussions and reviews

Textbooks and Reading Material

- Kramer S, Brown DK. Audiology: science to practice. Plural Publishing; 2021 Dec 7.
- Hall JW. Introduction to audiology today. Boston, MA: Pearson; 2014.
- Montano JJ, Spitzer JB, editors. Adult audiologic rehabilitation. Plural Publishing; 2020 Jan 20.
- Alpiner JG, McCarthy PA, editors. Rehabilitative audiology: Children and adults. Lippincott Williams & Wilkins; 2000.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and

speaking errors.

- **Collaborative Learning**
  Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-405	Credit Hours	3(2+1)
Course Title	Synopsis Writing				

Course Introduction

The "Subject Synopsis Writing" course is designed to provide students with the essential skills needed to create clear, concise, and engaging subject synopses. A subject synopsis is a brief summary that highlights the key points of a larger topic or piece of content, offering a snapshot of its main ideas. The ability to write effective synopses is crucial in academic, professional, and communication settings.

Throughout the course, students will learn to apply fundamental writing principles to distill complex information into succinct, impactful summaries. They will develop skills to analyze various types of content—such as articles, research papers, books, and reports—and extract the most relevant information to convey in their synopses. The course will also address techniques for both written and oral synopses, allowing students to adapt their skills to different communication formats.

Learning Outcomes

On the completion of the course, the students will:

- **Master the Fundamentals of Concise Writing**: Students will develop the ability to distill complex topics into clear, concise, and engaging summaries, ensuring clarity and precision in their writing.
- **Analyze and Extract Key Information**: Students will learn to critically analyze various types of content (articles, research papers, books, reports) and identify the most important information to include in their synopses.
- **Adapt Writing for Different Mediums**: Students will gain proficiency in creating both written and verbal synopses, adapting their style and approach to suit various communication formats and audiences.
- **Develop Effective Summarization Techniques**: Students will learn to identify main ideas, themes, and arguments, and develop strategies to convey these elements in a condensed form without losing essential meaning.
- **Enhance Critical Thinking and Synthesis Skills**: Through practice and application, students will enhance their ability to synthesize diverse information, combining insights from different sources to create cohesive and informative synopses.

Course Content (Theory)		Assignments/Readings
Week 1	**Introduction to Subject Synopses**: Definition, purpose, and importance of subject synopses	Read "The Art of Summarization"
	Role in Academic, Professional, and Communication Contexts	Research Paper: "Effective Summaries in Academia"
Week 2	**Analyzing Content**: Active reading strategies for effective comprehension	Practice: Active reading exercise on article
	Analyzing Content: Identifying main ideas, supporting details, and relevant examples	Assignment: Summarize an article with key points
Week 3	**Analyzing Content**: Recognizing different content structures and formats	Reading: Articles with different structures
	Distillation Techniques: Paraphrasing and summarizing strategies	Assignment: Paraphrase and summarize a research paper
Week 4	**Distillation Techniques**: Omitting redundant or non-essential information	Reading: "Principles of Effective Summary Writing"
	Distillation Techniques: Maintaining the original context and meaning	Assignment: Compare summaries for accuracy and clarity
Week 5	**Structuring the Synopsis**: Creating clear and concise introductory statements	Practice: Write introductions for different synopses
	Structuring the Synopsis: Organizing main points logically	Assignment: Organize key points for a topic synopsis

Week 6	**Structuring the Synopsis**: Concluding with impact: highlighting key takeaways	Read "The Power of a Strong Conclusion"
	Adapting to Audience and Medium: Tailoring synopses for different readers and platforms	Assignment: Adapt a synopsis for a professional audience
Week 7	**Adapting to Audience and Medium**: Adjusting tone, style, and level of detail	Practice: Rewriting summaries for different platforms
	Verbal Synopsis Skills: Effective note-taking during presentations or lectures	Assignment: Take notes on a video lecture and summarize
Week 8	**Verbal Synopsis Skills**: Summarizing content verbally while maintaining coherence	Class Activity: Verbal presentation of a topic synopsis
	Review and Revision: Editing for clarity, grammar, and coherence	Peer review: Edit and refine a classmate's synopsis
Week 9	**Review and Revision**: Seeking feedback and making improvements	Finalize written synopsis based on peer feedback
	Ethical Considerations: Proper attribution of ideas and sources	Read "Ethics of Summary Writing"
Week 10	**Ethical Considerations**: Avoiding plagiarism and misrepresentation	Assignment: Analyze plagiarism in sample synopses
	Final Revision and Feedback	Final Submission: Subject synopsis with peer and instructor feedback
Week 11	**Revision Techniques**: Reviewing and improving summaries	Practice: Peer feedback and final edits for clarity
	Advanced Structuring: Creating synopses for complex content	Read: Advanced techniques for writing concise synopses
Week 12	**Verbal and Written Synthesis**: Combining verbal and written summary skills	Assignment: Create a combined verbal and written synopsis
	Case Studies in Synopsis Writing: Examining successful examples	Review: Analyze top-quality synopses from various sources
Week 13	**Tailoring Synopses for Research Papers**	Assignment: Summarize a research paper into a concise overview
	Tailoring Synopses for Professional Reports	Assignment: Write a synopsis of a professional report
Week 14	**Advanced Audience Adaptation**: Customizing tone for diverse fields	Practice: Write synopses for varied academic disciplines
	Specialized Synopses: Writing synopses for technical content	Read: Writing synopses for scientific and technical papers
Week 15	**Ethical Considerations**: Accurate attribution in synopses	Case Study: Discuss ethics in summary writing
	Revisions and Final Feedback	Review: Provide feedback on peers' final drafts
Week 16	**Final Project Preparation**: Preparing a full-length subject synopsis	Assignment: Complete final project synopsis
	Course Review and Wrap-up	Final Presentation: Submit and present the final synopsis
Course Content (Lab)		**Assignments/Readings**
Week 1	**Introduction to Subject Synopses**: Overview and fundamentals	Hands-on: Identify key points from a sample text
Week 2	**Analyzing Content**: Active reading strategies	Practical Exercise: Annotate a reading for key ideas
Week 3	**Analyzing Content**: Identifying main ideas and supporting details	Group Activity: Extract key details from an article
Week 4	**Distillation Techniques**: Paraphrasing and summarizing	Practical Exercise: Paraphrase a

	strategies	research paper
Week 5	**Distillation Techniques**: Omitting redundant information	Practical Exercise: Edit an over-detailed summary
Week 6	**Structuring the Synopsis**: Creating clear and concise introductions	Write: Create an introduction for a provided topic
Week 7	**Structuring the Synopsis**: Organizing main points logically	Group Activity: Organize points for a class presentation
Week 8	**Adapting to Audience and Medium**: Tailoring synopses for different readers	Practical Exercise: Write a synopsis for a general audience
Week 9	**Adapting to Audience and Medium**: Adjusting tone, style, and detail	Rewrite: Adapt the synopsis for a different audience
Week 10	**Verbal Synopsis Skills**: Effective note-taking	Practice: Take notes during a video lecture and summarize
Week 11	**Verbal Synopsis Skills**: Summarizing verbally with coherence	Presentation: Summarize a given article verbally
Week 12	**Review and Revision**: Editing for clarity, grammar, and coherence	Practical Editing: Edit a classmate's draft synopsis
Week 13	**Review and Revision**: Seeking feedback and refining	Peer Review: Revise a synopsis based on feedback
Week 14	**Ethical Considerations**: Proper attribution and avoiding plagiarism	Case Study: Review and discuss ethical issues in summaries
Week 15	**Final Project**: Complete synopsis creation	Final Practical: Submit a complete written and verbal synopsis
Week 16	**Final Revision and Feedback**	Final Review: Discuss final projects and provide feedback

Textbooks and Reading Material

- Lyon, E. (2003). A Writer's Guide to Nonfiction: A Clear, Practical Reference for All Writers. Penguin.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-406	Credit Hours	3 (0+3)
Course Title	Field Experience/Internship				

Course Introduction

This course focuses on the identification, assessment, diagnosis, and treatment of individuals with impairments in either peripheral or central auditory and/or vestibular functions, with an emphasis on prevention. Audiologists play a critical role in providing both clinical and academic training to students in the field of audiology. Throughout this course, students will learn various clinical methods and techniques for audiological testing.

As part of the course, students will have the opportunity to visit audiology clinics and complete internships at their university's teaching hospital. Under the supervision of experienced instructors, students will interact with patients, taking detailed case histories and conducting patient assessments. They will also learn to differentiate between age-related and cognition-related testing needs, and determine the most appropriate testing protocols for individual patients.

Learning Outcomes

On the completion of the course, the students will:

- **Identify and Assess Auditory and Vestibular Impairments**: Demonstrate the ability to identify and assess impairments in peripheral and central auditory and vestibular functions, using appropriate clinical methods.
- **Diagnose and Treat Auditory Disorders**: Apply diagnostic techniques to evaluate auditory and vestibular disorders and develop treatment plans for patients.
- **Implement Age- and Cognition-Related Testing**: Recognize the impact of age and cognitive function on auditory and vestibular testing, and adapt testing protocols accordingly.
- **Conduct Comprehensive Patient Assessments**: Effectively take case histories and perform thorough examinations of patients, ensuring that all relevant factors are considered in the assessment process.
- **Apply Best Testing Protocols**: Select and implement the most suitable testing protocols for individual patients based on their unique needs and clinical presentation.
- **Enhance Clinical and Communication Skills**: Develop strong clinical skills, including patient interaction and communication, under the supervision of experienced audiologists and faculty members.
- **Gain Practical Experience in Clinical Settings**: Gain hands-on experience through internships in audiology clinics and university teaching hospitals, working directly with patients in real-world clinical environments.
- **Demonstrate Professionalism in Clinical Practice**: Exhibit professionalism in patient care, adhering to ethical standards and guidelines while working with patients in both supervised and independent settings.

Course Content (Lab)		Assignments/Readings
Week 1	Introduction to Audiology and Hearing Aid Fitting	Completes hearing aid fitting and electroacoustic analysis of hearing aids
	Basics of Audiometric Testing and Equipment	Report related to complete electroacoustic checks of hearing aids for fitting/follow-up sessions
	Introduction to Ear Mold Impressions	Makes ear mold impressions
Week 2	Masking Criteria and Procedures	Recites criteria for masking, completes masking procedures with assistance
	Pure Tone Audiometry Techniques	Interprets pure tone audiometer results
	Speech Audiometry Procedures	Interprets speech audiometer results
Week 3	Tympanometry and Middle Ear Testing	Interprets tympanometry results

	Communicative Performance and Referral Procedures	Observes clients' overall communicative performance as a basis for referral to additional services
	Improving Clinical Session Efficiency	Increases efficiency in conducting clinical sessions
Week 4	Modifying Test Procedures for Individual Needs	Initiates modifications in test procedures to meet clients' needs
	Behavioral Audiometry Basics	Initially assists, then begins conducting basic behavioral audiometric workups
	Tympanometry Testing	Assists in conducting tympanometry workups
Week 5	Test Environment Setup	Uses appropriate lighting arrangement in testing suites
	Pediatric Audiometry and Behavioral Testing	Assists with behavioral infant testing
	Hearing Aid Evaluations and Adjustments	Assists with evaluations and adjustments of hearing aids
Week 6	Electroacoustic Analysis of Hearing Aids	Assists with electroacoustic analysis of hearing aids
	Ear Mold Impressions and Hearing Aid Orientation	Assists with ear mold impressions, completes hearing aid forms, and assists with hearing aid orientations
	Client Release Process	Checks with supervisor prior to releasing client
Week 7	Report Documentation and Distribution	Obtains a signed release form for the distribution of reports
	Report Writing Skills	Uses a word processor to complete rough drafts of reports
	Finalizing Clinical Reports	Completes final drafts of reports for clients
Week 8	Universal Precautions in Audiology	Follows clinic's Universal precautions procedures
	Clinical Hour Tracking and Documentation	Meets with Audiology coordinator to tally and file clinical hours
	Introduction to Advanced Audiometric Testing	Completes advanced audiometric testing with supervision
Week 9	Reviewing Audiology Reports and Data	Assists in reviewing audiology reports and results for accuracy
	Managing Clinical Workflow	Works on improving workflow efficiency during clinical sessions
	Case Study Review and Management	Reviews and discusses case studies with clinical supervisors
Week 10	Advanced Tympanometry Techniques	Completes tympanometric testing for complex cases
	Masking Techniques and Protocols	Independently completes masking procedures
	Special Populations and Audiology	Assists with testing and evaluation of special populations (e.g., pediatrics, geriatrics)
Week 11	Handling Complex Audiometric Cases	Assists in handling complex audiometric testing and

		interpretation
	Hearing Aid Counseling and Orientation	Provides hearing aid counseling and orientations under supervision
	Managing Hearing Aid Issues	Assists with troubleshooting and managing hearing aid issues
Week 12	Patient Follow-up Procedures	Assists with patient follow-up visits and adjustments
	Advanced Audiometry	Independently conducts advanced audiometric evaluations
	Integrating Clinical Data	Combines clinical data to prepare comprehensive reports for patients
Week 13	Working with Multidisciplinary Teams	Works alongside multidisciplinary teams in patient care
	Audiology Testing for Cochlear Implants	Assists with testing and evaluations related to cochlear implants
	Audiology in Rehabilitation	Participates in audiology-related rehabilitation procedures
Week 14	Clinical Research in Audiology	Observes and assists with clinical research in audiology
	Legal and Ethical Issues in Audiology	Reviews and discusses legal and ethical standards in audiology practice
	Preparing for Final Evaluation	Prepares for the final assessment of clinical skills and knowledge
Week 15	Reflection and Self-assessment	Reflects on personal progress and clinical experiences
	Preparing Clinical Reports for Presentation	Finalizes and prepares clinical reports for presentation
	Advanced Hearing Aid Adjustments	Independently performs advanced hearing aid evaluations and adjustments
Week 16	Reviewing Testing Protocols	Reviews and adjusts testing protocols for patient-specific needs
	Preparing for Final Clinical Exam	Prepares for final clinical exam and evaluation
	Final Clinical Assessment and Review	Completes final clinical assessments and reviews with supervisors

Textbooks and Reading Material

- Katz, J., Chasin, M., English, K. M., Hood, L. J., & Tillery, K. L. (Eds.). (2015). *Handbook of clinical audiology* (Vol. 7). Philadelphia, PA: Wolters Kluwer Health.

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.

- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-407	Credit Hours	3(2+1)
Course Title	Implantable Devices				

Course Introduction

The study focuses on implantable devices that assist individuals with disabilities in restoring normal function for as long as possible. It will guide students in understanding the definition, purpose, and criteria for selecting these devices. The curriculum will cover when implantable devices are used in medical practice, as well as the expected outcomes for patients. Students will also examine the merits and demerits of implantable devices, including their suitability for different age groups. Key aspects such as the protocols for implantation, ongoing care, and maintenance will be explored, alongside the precautions and safety measures necessary to minimize risks. Overall, the study aims to provide students with a comprehensive understanding of implantable devices, their role in improving patient outcomes, and the considerations required for their effective use in medical settings.

Learning Outcomes

On the completion of the course, the students will:

- **Define and explain** the concept of implantable devices and their role in medical treatment for individuals with disabilities.
- **Identify the criteria** for selecting appropriate implantable devices based on patient needs and medical conditions.
- **Understand the indications** for the use of implantable devices and the conditions under which they are most effective.
- **Evaluate the expected outcomes** of implantable devices, including their benefits and potential limitations.
- **Analyze the advantages and disadvantages** of implantable devices, considering factors like age, patient health, and device type.
- **Understand the protocols** involved in the implantation, management, and maintenance of implantable devices.
- **Recognize the precautions** and safety measures required to minimize risks and ensure the proper functioning of implantable devices.
- **Assess the impact** of implantable devices on the overall quality of life and functional independence of patients.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Cochlear Implants, Historical Review	Read: "History of Cochlear Implants" Article
	Parts and Working of Cochlear Implants	Read: "Basics of Cochlear Implants"
Week 2	Types of Cochlear Implants: An Overview	Assignment: Research and compare different types of cochlear implants
	Design and Features of Cochlear Implants	Read: "Technological Advancements in Cochlear Implants"
Week 3	Speech Processing Strategies: Fundamentals	Read: "Speech Processing in Cochlear Implants"
	Advanced Speech Processing Strategies	Case study: Discuss speech processing strategies for various cases
Week 4	Assessment Strategies for Cochlear Implants	Assignment: Review different cochlear implant assessment tools
	Candidacy Criteria for Cochlear Implants	Research: Discuss factors that determine candidacy for cochlear implants
Week 5	Pre-implantation Rehabilitation and Counseling	Read: "Pre-implantation Counseling Guidelines"

	Post-implantation Rehabilitation and Counseling	Case Study: Post-implantation rehabilitation strategies
Week 6	Team Members and Their Roles in Rehabilitation	Discuss roles of professionals in cochlear implant rehabilitation
	Merits of Cochlear Implants	Assignment: Write an essay on the benefits of cochlear implants
Week 7	Demerits of Cochlear Implants	Debate: Discuss the challenges and limitations of cochlear implants
	Current Trends and Innovations in Cochlear Implants	Research Paper: Explore the latest trends in cochlear implant technology
Week 8	Introduction to Tinnitus Maskers	Read: "Role of Tinnitus Maskers in Hearing Rehabilitation"
	Overview of Middle Ear Implants	Research: "Middle Ear Implants: Mechanisms and Uses"
Week 9	Bone Anchored Hearing Aids (BAHA): Types and Applications	Case Study: Compare BAHA with cochlear implants in terms of functionality
	Brainstem Implants: Overview and Applications	Research: "Brainstem Implants: A New Frontier in Auditory Technology"
Week 10	Cochlear Implants in Pediatrics	Read: "Pediatric Cochlear Implantation: Challenges and Successes"
	Cochlear Implants in Adults	Discuss: Adult candidates for cochlear implants and outcomes
Week 11	The Impact of Cochlear Implants on Speech and Language Development	Case study: Review language development in children post-implant
	Cochlear Implants and Quality of Life	Research: "Impact of Cochlear Implants on Quality of Life"
Week 12	Factors Affecting Cochlear Implant Success	Assignment: Analyze factors affecting cochlear implant outcomes
	Electrophysiological and Psychophysical Measurements	Read: "Electrophysiological Assessment in Cochlear Implants"
Week 13	Surgical Procedures and Considerations	Discuss: Surgical steps involved in cochlear implantation
	Post-Surgery Care and Follow-up	Review: "Post-surgery Care for Cochlear Implant Patients"
Week 14	Cochlear Implant Programming and Mapping	Hands-on: Learn the programming techniques for cochlear implants
	Patient Expectations and Outcomes	Discuss: How patient expectations shape rehabilitation outcomes
Week 15	Ethical Considerations in Cochlear Implantation	Case Study: Ethical dilemmas in cochlear implantation
	Multidisciplinary Approach in Cochlear Implant Rehabilitation	Discuss the role of audiologists, speech therapists, and surgeons
Week 16	Technological Advances and Future Directions in Cochlear Implants	Research: Explore the future of cochlear implants and emerging technologies
	Review of Key Concepts and Case Study Discussion	Assignment: Case study on patient selection, implantation, and rehabilitation

Course Content (Lab)		Assignments/Readings
Week 1	Introduction to cochlear implants	Demonstration of cochlear implant models
Week 2	Parts and working of cochlear implant	Dissect and examine cochlear implant components
Week 3	Types of cochlear implants	Hands-on identification of different cochlear implants
Week 4	Design and features of cochlear implants	Analyze cochlear implant design features
Week 5	Speech processing strategies	Simulate speech processing strategies with cochlear implants
Week 6	Assessment strategies for cochlear implants	Conduct hearing assessments using implant simulation tools
Week 7	Candidacy assessment	Evaluate candidacy based on audiometric data
Week 8	Pre-implant rehabilitation strategies	Simulate pre-implant rehabilitation session
Week 9	Post-implant rehabilitation strategies	Hands-on rehabilitation exercises post-implant
Week 10	Merits and demerits of cochlear implants	Group discussion on case studies with cochlear implants
Week 11	Current trends in cochlear implants	Research presentation on current global trends
Week 12	Introduction to tinnitus maskers	Hands-on demonstration of tinnitus maskers
Week 13	Middle ear implants	Practical on fitting and functioning of middle ear implants
Week 14	BAHA fitting and assessment	Practice BAHA fitting and assessment techniques
Week 15	Brainstem implants	Explore practical scenarios for brainstem implant candidates
Week 16	Evaluation and assessment of cochlear implant outcomes	Case study evaluation on implant success and outcomes

Textbooks and Reading Material

- Roeser, R. J., Valente, M., & Hosford-Dunn, H. (2000). Audiology: diagnosis. (No Title).

Teaching Learning Strategies

- **Interactive Lectures**
  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-408	Credit Hours	3 (0+3)
Course Title	Seminar: Updates and Current Development				

Course Introduction

This module will explore the decision-making processes employed by audiologists in determining their approach and practice within the field of audiology. It will cover the various strategies audiologists use in different settings, including working with individuals, families, groups, communities, and populations, all aimed at achieving optimal outcomes. The module will also emphasize the importance of collaborative work with other healthcare professionals, families, and caregivers. In addition to clinical experience, students will demonstrate proficiency in note-taking and report writing, ensuring that their documentation meets the international standards set by the American Speech-Language-Hearing Association (ASHA).

Learning Outcomes

On the completion of the course, the students will:

- **Understand and apply decision-making processes** in audiology practice, ensuring effective outcomes for individuals, families, and communities.
- **Identify and analyze the various approaches** used by audiologists across different practice settings, and adapt these approaches to meet the needs of diverse populations.
- **Demonstrate collaborative working skills** with multidisciplinary teams, including other healthcare professionals, families, and caregivers, to achieve optimal patient care.
- **Develop and implement evidence-based strategies** for working with individuals and groups to enhance auditory health outcomes.
- **Write clear, accurate, and professional clinical notes and reports** that meet international standards, specifically those set by the American Speech-Language-Hearing Association (ASHA).
- **Critically assess and integrate feedback** from clinical experiences to refine audiological practice and improve patient-centered care.
- **Apply ethical decision-making** in a variety of clinical contexts, taking into consideration cultural, social, and individual factors.
- **Demonstrate an understanding of documentation standards** and how these relate to clinical practice and legal requirements in audiology.

Course Content (Lab)		Assignments/Readings
Week 1	Introduction to Hearing Disorders: Overview of Hearing and its Mechanisms	Practical demonstration of hearing tests
	Conductive Hearing Loss: Causes, Symptoms, and Diagnosis	Practical on otoscopic examination
	Conductive Hearing Loss: Treatment and Management	Practical: Tympanometry, audiometry testing
Week 2	Sensorineural Hearing Loss: Causes, Symptoms, and Diagnosis	Practical on audiogram interpretation
	Sensorineural Hearing Loss: Treatment and Management	Practical: Speech audiometry, tests for SNHL
	Mixed Hearing Loss: Causes, Symptoms, and Diagnosis	Practical on combined hearing loss assessment
Week 3	Mixed Hearing Loss: Treatment and Management	Practical on differential diagnosis
	Otitis Media with Effusion: Causes, Symptoms, and Diagnosis	Practical on tympanic membrane examination
	Otitis Media with Effusion: Treatment and Management	Practical on management strategies for OME
Week 4	Chronic Suppurative Otitis Media: Causes, Symptoms, and Diagnosis	Practical: Pus culture and sensitivity testing

	Chronic Suppurative Otitis Media: Treatment and Management	Practical on ear cleaning and medication administration
	Meniere's Disease: Causes, Symptoms, and Diagnosis	Practical on vestibular function testing
Week 5	Meniere's Disease: Treatment and Management	Practical on balance assessment tests
	Tinnitus: Causes, Symptoms, and Diagnosis	Practical: Sound therapy and masking techniques
	Tinnitus: Treatment and Management	Practical on counseling for tinnitus patients
Week 6	Vertigo Disorders: Types, Symptoms, and Diagnosis	Practical on nystagmus testing
	Vertigo Disorders: Treatment and Management	Practical on positional testing for vertigo
	Review of All Hearing Disorders: Overview of Diagnosis and Management	Practical: Comprehensive case study reviews
Week 7	**Case Study Presentations** (1-4): Students present cases of various hearing disorders	Practical: Hearing test demonstrations
	Case Study Presentations (5-8): Continued case studies and management strategies	Practical: Audiological evaluations
	Case Study Presentations (9-12): Case studies review	Practical: Treatment demonstration
Week 8	**Papers Assignment**: Students to submit a research paper on one of the disorders	Practical: Peer reviews and discussions
	Hearing Disorders in Pediatric Population: Identification and Management	Practical: Pediatric hearing screening
	Hearing Disorders in Geriatric Population: Identification and Management	Practical: Audiological assessment in elderly
Week 9	Advances in Hearing Aids and Assistive Devices	Practical: Hearing aid fitting and adjustment
	Cochlear Implants: Indications, Procedure, and Follow-up Care	Practical: Cochlear implant device setup
	Review of Otitis Media and Chronic Ear Infections	Practical: Ear discharge management
Week 10	**Mid-term Exam (Theory and Practical)**: Review of first half of the course	Practical: Demonstrations on practical skills
	Mid-term Exam Results Review and Feedback: Discuss student performance	Practical: Corrective practical work based on feedback
	Meniere's Disease: Long-term Management and Rehabilitation	Practical: Rehabilitation exercises for Meniere's
Week 11	Tinnitus Management: Cognitive Behavioral Therapy (CBT) Approach	Practical: CBT for tinnitus patients
	Guest Lecture: Advances in Vertigo Treatment	Practical: Case discussion and Q&A
	Vestibular Disorders: Diagnosis and Management	Practical: Balance training techniques
Week 12	Vertigo and Balance Disorders in Post-Surgical Patients	Practical: Post-surgical rehabilitation exercises
	Assignments Due: Submit an individual case study or research paper	Practical: Presentation of individual cases
	Review of Diagnostic Tools for Hearing and Balance Disorders	Practical: Use of diagnostic equipment
Week 13	Vestibular Rehabilitation Therapy (VRT) in Vertigo Disorders	Practical: VRT techniques and demonstration

	Practical Exam (Individual Assessment): Evaluation of clinical skills	Practical: Comprehensive assessment of skills
	Hearing Loss and Cognitive Decline: Connection and Management	Practical: Cognitive testing for patients with hearing loss
Week 14	Current Research on Tinnitus and New Therapies	Practical: Tinnitus rehabilitation exercises
	Update on Emerging Treatments for Hearing Loss	Practical: New therapy methods demonstration
	Understanding Audiological Reports and Data Interpretation	Practical: Audiogram and test data analysis
Week 15	**Final Paper Submission**: Submit a research paper on any hearing or balance disorder	Practical: Peer feedback sessions
	Ethical Issues in the Management of Hearing and Balance Disorders	Practical: Role-play on ethical scenarios
	Advanced Technology in Hearing Rehabilitation	Practical: Virtual reality tools in rehabilitation
Week 16	**Final Presentations (1-4)**: Present case studies focusing on complex disorders	Practical: Audiological assessments and management plans
	Final Presentations (5-8): Continued complex case studies presentations	Practical: In-depth treatment strategies demonstration
	Final Presentations (9-12): Last round of student presentations	Practical: Wrap-up and feedback on all presentations

Textbooks and Reading Material

- Molina, P. E., & Molina, P. E. (2006). *Endocrine physiology*. New York: Lange Medical Books/McGraw-Hill.
- Lieber, R. L. (2002). *Skeletal muscle structure, function, and plasticity*. Lippincott Williams & Wilkins.
- Hall, J. E. (2015). *Pocket Companion to Guyton & Hall Textbook of Medical Physiology E-Book*. Elsevier Health Sciences.

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details

1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-410	Credit Hours	3 (2+1)
Course Title	Introduction to Artificial Intelligence in Audiology				

Course Introduction

This course offers an introduction to the fundamental concepts and techniques that bridge Artificial Intelligence (AI) and Speech and Language Processing (SLP). As AI technologies rapidly evolve, there is growing focus on improving communication between humans and machines. Students will explore the core principles of AI and how these concepts are applied to the processing, understanding, and enhancement of human language across various contexts.

Learning Outcomes

On the completion of the course, the students will:

- **Understand the foundational concepts of Artificial Intelligence (AI)** and their application to Speech and Language Processing (SLP).
- **Analyze the key techniques and algorithms** used in AI-driven language processing, including natural language understanding, speech recognition, and generation.
- **Apply AI methods** to solve real-world problems in speech and language tasks such as sentiment analysis, machine translation, and speech synthesis.
- **Evaluate and compare various AI models** and tools used in language processing, considering their strengths, limitations, and appropriate contexts.
- **Develop basic AI systems** that can process and interpret human language, enabling effective communication between humans and machines.
- **Critically assess the ethical and societal implications** of AI technologies in speech and language applications, including privacy, bias, and fairness.
- **Stay informed about current trends and innovations** in AI and SLP, preparing for future developments in these fields.

Course Content (Theory)		Assignments/Readings
Week 1	**Course Content**	**Assignments/Readings**
	Introduction to Artificial Intelligence: Overview of AI history, goals, and subfields.	Read "Artificial Intelligence: A Guide for Thinking Humans".
Week 2	**Introduction to Artificial Intelligence**: Machine learning vs. rule-based approaches.	Prepare a summary of the differences between machine learning and rule-based systems.
	Introduction to Artificial Intelligence: Introduction to neural networks and deep learning.	Watch a video on the basics of neural networks.
Week 3	**Foundations of Hearing Processing**: Hearing basics: understanding and processing.	Read an article on the anatomy of the ear and its role in hearing.
	Foundations of Hearing Processing: Speech recognition and synthesis technologies.	Write a brief report on speech recognition technologies.
Week 4	**Natural Language Processing (NLP)**: Text preprocessing and tokenization.	Implement a simple tokenization task in Python.
	Natural Language Processing (NLP): Sentiment analysis and text classification.	Complete a sentiment analysis exercise on social media data.
Week 5	**Natural Language Processing (NLP)**: Named entity recognition and information extraction.	Read a case study on information extraction in NLP.
	Machine Learning for Audiology: Supervised learning applied to hearing data.	Complete a supervised learning assignment using hearing test data.
Week 6	**Machine Learning for Audiology**: Unsupervised learning applied to hearing data.	Prepare a project using clustering algorithms on hearing data.

	Machine Learning for Audiology: Reinforcement learning applied to hearing data.	Research reinforcement learning applications in audiology.
Week 7	**Dialogue Systems and Conversational Agents**: Building chatbots and virtual assistants.	Read an article on building basic chatbots.
	Dialogue Systems and Conversational Agents: Understanding user intent and context.	Create a flowchart demonstrating how chatbots interpret user intent.
Week 8	**Ethical Considerations and Bias in AI**: Addressing bias in training data and AI systems.	Write a paper on ethical concerns in AI systems for audiology.
	Ethical Considerations and Bias in AI: Privacy concerns and responsible AI development.	Review a case study on privacy issues in AI applications.
Week 9	**Future Trends in AI and Audiology**: Recent advancements and emerging applications.	Research and present on a recent AI development in audiology.
	Introduction to Artificial Intelligence: Applications of AI in healthcare.	Read about AI applications in the medical field.
Week 10	**Introduction to Machine Learning**: Overview of supervised and unsupervised learning.	Write a comparison of supervised and unsupervised learning with examples.
	Introduction to Neural Networks: Deep learning concepts in audio processing.	Complete an online module on deep learning basics.
Week 11	**Foundations of Hearing Processing**: Basic hearing mechanism and its relevance to AI.	Read an article on AI applications in audiology for hearing aids.
	Foundations of Hearing Processing: Use of AI in auditory rehabilitation.	Prepare a report on AI-driven devices for auditory rehabilitation.
Week 12	**Natural Language Processing (NLP)**: Techniques in NLP for audiology applications.	Study a case on how NLP is used in audiology for speech therapy.
	Natural Language Processing (NLP): Building and evaluating NLP models.	Write a review of common NLP libraries and their uses.
Week 13	**Machine Learning for Audiology**: Practical machine learning models for audiology data.	Implement a machine learning model for noise reduction in hearing aids.
	Machine Learning for Audiology: Real-time hearing data analysis.	Study how real-time hearing aids work with AI systems.
Week 14	**Dialogue Systems**: Key principles of conversational agents.	Create an outline for a virtual assistant for hearing aid users.
	Dialogue Systems: Multi-turn conversation strategies.	Research existing conversational agents and present findings.
Week 15	**Ethical Considerations in AI**: Transparency and explain ability of AI models.	Write a paper on the importance of explainable AI in healthcare.
	Ethical Considerations in AI: Impact of AI on decision-making in audiology.	Discuss the ethical dilemmas of AI decisions in audiology.
Week 16	**Ethical Considerations in AI**: Developing responsible AI for hearing applications.	Prepare a presentation on responsible AI in audiology.
	Future Trends in AI and Audiology: The role of AI in personalized hearing care.	Research emerging trends in personalized hearing devices.
Course Content (Lab)		**Assignments/Readings**
Week 1	**Introduction to AI**: Hands-on exploration of AI concepts.	Practice using AI-based software for basic tasks.
Week 2	**Machine Learning**: Supervised learning algorithms.	Implement a basic supervised learning algorithm on hearing data.
Week 3	**Neural Networks**: Creating simple neural networks for audio processing.	Build and test a neural network using a hearing dataset.
Week 4	**Hearing Basics**: Simulate sound wave processing and	Use software tools to simulate and

	analysis.	analyze sound processing.
Week 5	**Speech Recognition**: Implementing speech-to-text technology.	Test a speech recognition tool on different audio inputs.
Week 6	**Speech Synthesis**: Exploring text-to-speech systems.	Generate speech from text using an AI-driven TTS system.
Week 7	**Text Preprocessing**: Tokenization and text analysis for audiology data.	Write a Python script for text preprocessing and tokenization of audiology data.
Week 8	**Sentiment Analysis**: Implementing sentiment analysis models on audiology-related text.	Use an NLP library to analyze sentiment in audiology case reports.
Week 9	**Named Entity Recognition**: Extracting entities from audiology-related texts.	Build an NER model to identify medical entities in audiology reports.
Week 10	**Machine Learning**: Supervised learning models for audiology data analysis.	Train a supervised learning model for hearing loss prediction.
Week 11	**Unsupervised Learning**: Clustering hearing-related data.	Apply clustering algorithms (e.g., K-means) on hearing test data.
Week 12	**Reinforcement Learning**: Implementing reinforcement learning for audiology scenarios.	Simulate a reinforcement learning model for dynamic hearing aid adjustments.
Week 13	**Dialogue Systems**: Building a chatbot for audiology-related queries.	Develop a basic chatbot that answers hearing-related questions.
Week 14	**User Intent and Context**: Analyzing user queries in audiology.	Test a chatbot's ability to understand user intent and respond accordingly.
Week 15	**Ethical AI Considerations**: Identifying and addressing bias in AI models.	Analyze datasets for potential biases and adjust AI models accordingly.
Week 16	**Future Trends**: Exploring AI-driven applications in audiology.	Present a report on new AI technologies transforming audiology and hearing aids.

Textbooks and Reading Material

- Brewka, G. (1996). Artificial intelligence—a modern approach by Stuart Russell and Peter Norvig, Prentice Hall. Series in Artificial Intelligence, Englewood Cliffs, NJ. *The Knowledge Engineering Review*, *11*(1), 78-79.

Teaching Learning Strategies

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  Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
- **Collaborative Learning**
- Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
- **Case Studies**
  Use case studies to explore real-life examples of communication in business, academic, and casual settings.
- **Role-Playing and Simulations**
  To practice persuasive speaking, public speaking, and informal conversations.
- **Technology Integration**
  Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

- Quiz-1
- Quiz-II
- Presentation
- Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Programme	Audiology	Course Code	AUD-411	Credit Hours	3 (0+3)
Course Title	Capstone Project				

Course Introduction

This course covers fundamental quantitative methods and research designs, focusing on concepts such as reliability, validity, and the interpretation of inferential statistics. Topics also include correlational statistics and designs, interclass correlation coefficients, and critical appraisal of existing literature. The course is designed to provide students with a comprehensive understanding of research methodology, encompassing both the theory of science and the application of qualitative and quantitative research methods.

Learning Outcomes

On the completion of the course, the students will:

- Understand and apply key concepts in quantitative research, including reliability, validity, and inferential statistics.
- Analyze and interpret results from various statistical methods, including correlational statistics and designs.
- Calculate and interpret interclass correlation coefficients.
- Critically evaluate and appraise research literature, identifying strengths, weaknesses, and areas for improvement.
- Demonstrate a comprehensive understanding of research methodology, integrating both qualitative and quantitative methods.
- Develop an appreciation for the theory of science and its role in shaping research designs and methodologies.
- Apply appropriate statistical tools to assess the quality and validity of research findings in different contexts.

Course Content		Assignments/Readings
Week 1	Introduction to Statistics	Overview of Statistics and its Importance
	Definition of Statistics	Define Statistics in Health Sciences Context
	Population & Sample	Identifying Population and Sample in Research
Week 2	Descriptive and Inferential Statistics	Case Study on Descriptive vs Inferential Statistics
	Types of Variables	Identifying Variables in Health Data
	Measurement Scales	Classification of Variables Using Different Scales
Week 3	Collection of Primary and Secondary Data	Data Collection Methods in Health Research
	Data Sources	Identifying Reliable Data Sources in Healthcare
	Diagrams and Graphs	Constructing Bar Charts and Pie Charts
Week 4	Bar Charts, Pie Charts, Histogram	Create and Analyze Different Types of Graphs
	Measures of Central Tendency	Introduction to Central Tendency in Health Data
	Mean, Median, and Mode	Calculate Central Tendency for Sample Data
Week 5	Percentiles	Calculating Percentiles for Health Data

	Range	Determine Range in Health Data
	Standard Deviation	Calculating Standard Deviation for Health Data
Week 6	Variance	Variance Analysis in Healthcare Statistics
	Coefficient of Variation	Interpret Coefficient of Variation in Research Data
	Regression & Correlation	Introduction to Regression and Correlation Analysis
Week 7	Scatter Diagram	Creating and Interpreting Scatter Diagrams
	Straight Line Regression Model	Apply Regression Model to Healthcare Data
	Sample Correlation Coefficient	Calculating and Interpreting Correlation Coefficients
Week 8	Regression Coefficients	Interpretation of Regression Coefficients in Health Research
	Hypothesis Testing	Understanding Hypothesis Testing in Research
	Null and Alternative Hypothesis	Developing Hypothesis for Health Studies
Week 9	Types of Errors in Hypothesis Testing	Identifying Errors in Health Research Hypothesis
	One-tailed and Two-tailed Hypothesis	Application of Hypothesis Testing in Health Data
	General Steps in Hypothesis Testing	Apply Hypothesis Testing on Sample Data
Week 10	Sampling Concept	Introduction to Sampling in Health Research
	Types and Methods of Drawing an Ideal Sample	Identifying Sampling Techniques for Health Data
	Research Fundamentals	Overview of Research in Allied Health Sciences
Week 11	Objectives of Research	Setting Research Objectives in Healthcare
	Motivation in Research	Understanding the Motivation Behind Health Research
	Types of Research	Identifying Types of Research in Allied Health
Week 12	Research Ethics	Exploring Ethical Issues in Health Research
	Research Design Overview	Designing Research in Health Sciences
	Research Problems, Questions, and Hypothesis	Developing Research Questions for Healthcare Studies
Week 13	Research Validity	Ensuring Validity in Health Research
	Measurement Theory	Exploring Measurement Concepts in Health Studies
	Methodological Research	Applying Methodological Approaches to Health Research
Week 14	Statistical Reasoning	Introduction to Statistical Reasoning

		in Health
	Statistical Analysis of Differences: Basics	Applying Basic Statistical Analysis to Health Data
	Statistical Analysis of Differences: Advanced Techniques	Using Advanced Statistical Analysis in Health Research
Week 15	Statistical Analysis of Relationships: Basics	Basic Analysis of Relationships in Health Data
	Statistical Analysis of Relationships: Advanced Techniques	Advanced Statistical Techniques in Healthcare Research
	Implementing a Research Project	Planning a Research Project in Allied Health
Week 16	Publishing Research	Guidelines for Publishing Health Research
	Presenting Research	Effective Presentation of Health Research
	Review and Evaluation of Internship	Final Project Evaluation and Feedback

Textbooks and Reading Material

- Daniel, W. W., & Cross, C. L. (2018). *Biostatistics: a foundation for analysis in the health sciences*. Wiley.
- Pagano, M., Gauvreau, K., & Mattie, H. (2022). *Principles of biostatistics*. CRC Press.

Programme	Audiology	Course Code	AUD-412	Credit Hours	2(2+0)
Course Title	Research Methodology & Skill Enhancement				

Course Introduction

This course is designed to provide you with a comprehensive understanding of research methodologies and equip you with essential skills for conducting effective research. Whether you are starting your academic journey, preparing for advanced studies, or looking to enhance your professional capabilities, this course will serve as a foundational experience.

Learning Outcomes

On the completion of the course, the students will:

- **Understanding Research Principles**: Knowledge of qualitative, quantitative, and mixed-method research approaches.
- **Formulation of Research Questions**: Ability to generate relevant, clear, and testable research questions and hypotheses.
- **Literature Review & Critical Analysis**: Skill in conducting literature reviews and critically analyzing existing research.
- **Research Design & Method Selection**: Ability to choose appropriate research designs and methods based on objectives.
- **Data Collection Techniques**: Proficiency in qualitative and quantitative data collection methods (e.g., surveys, interviews, experiments).
- **Data Analysis & Interpretation**: Ability to analyze data using statistical tools or qualitative coding techniques.
- **Report Writing & Presentation**: Skill in writing structured research reports and presenting findings clearly.
- **Critical Thinking & Problem Solving**: Ability to evaluate research methodologies and solve problems creatively.
- **Ethical Considerations**: Understanding and applying ethical standards in research (e.g., informed consent, confidentiality).
- **Communication Skills Enhancement**: Improvement in both written and oral communication for presenting research effectively.
- **Use of Technology in Research**: Proficiency in using digital tools for data collection, analysis, and citation management.
- **Time Management & Project Planning**: Ability to plan and manage research projects within set timelines and resources.

Course Content (Theory)		Assignments/Readings
Week 1	Introduction to Research Methodology; Overview of unethical academic practices (plagiarism)	Read: Research Ethics
	Importance of research and need for research in various fields; Types of research	Read: Article on Types of Research Methods
Week 2	Extraction and review of literature; Importance of literature review in research	Assignment: Conduct a brief literature review on a chosen topic
	Understanding the process of reviewing literature; Tools for literature review	Read: Research papers on systematic review
Week 3	Identifying a research problem: Key strategies and methods	Assignment: Identify a research problem from current issues
	Formulating a research hypothesis and objectives	Read: Guidelines for hypothesis formulation
Week 4	Designing a study: Research designs and their application	Assignment: Choose a research design for a given problem
	Types of research designs: Experimental, non-	Read: Research Designs

	experimental, and observational	
Week 5	Data collection methods: Qualitative vs. Quantitative methods	Assignment: Prepare a data collection plan for a research project
	Ethical considerations in data collection	Read: Articles on ethical guidelines for data collection
Week 6	Data collection tools and techniques: Surveys, Interviews, Questionnaires	Assignment: Design a survey for data collection
	Introduction to data interpretation and analysis	Read: Data Analysis Techniques
Week 7	Statistical tools for data analysis; Quantitative vs. qualitative analysis	Assignment: Practice with SPSS or other statistical tools
	Introduction to qualitative data analysis and coding	Read: Articles on qualitative data analysis methods
Week 8	Analyzing research results and drawing conclusions	Assignment: Analyze a given dataset and write findings
	Writing a research report: Structure and components	Read: Guidelines for writing research papers
Week 9	Writing a thesis or research article: Common sections and formats	Assignment: Draft the introduction and literature review for a thesis
	Writing a research article or review: Submission guidelines for journals	Read: Sample research articles and review them
Week 10	Preparing research posters: Key elements and design tips	Assignment: Create a research poster based on a research topic
	Making scientific presentations: Effective delivery and communication	Assignment: Prepare a presentation for a research topic
Week 11	Creating impactful presentations: Visual aids and slides	Read: Effective Presentation Skills
	Intellectual property: Understanding copyrights, patents, and research ownership	Read: Articles on intellectual property in research
Week 12	Managing references and citations using tools like Zotero	Assignment: Set up a citation manager and add references
	Writing an abstract: Importance and guidelines	Assignment: Write an abstract for a research project
Week 13	Peer review process in research publishing	Read: Article on the peer review process in academic journals
	Ethical issues in publishing and authorship	Assignment: Analyze ethical dilemmas in academic publishing
Week 14	Advanced research tools and software	Read: advanced research tools and data analysis software
	Final project preparation: Structuring a research project	Assignment: Finalize research project proposal
Week 15	Presenting research findings effectively in conferences	Read: Case studies on successful conference presentations
	Preparing for a final exam or project submission	Review: Course material and guidelines for final submission
Week 16	Final research project presentation	Assignment: Present final research project to the class
	Review and evaluation of research projects; Feedback and improvements	Submit final project report; Peer review of projects
Textbooks and Reading Material		
• Bryman A, 2001. Social research methods. 2nd Edition; Oxford University Press. • Awan JA, 2003. Scientific Presentation. Unitech Communication, Faisalabad, Pakistan.		

- Kumar R, Kindersley D, 2010. Research Methodology: A step by step guide for beginners. Third Edition; SAGE Publications.

Teaching Learning Strategies

1. **Interactive Lectures**
   Engage students with interactive presentations, discussions, and real-time corrections of writing and speaking errors.
2. **Collaborative Learning**
   Students will work in pairs or small groups to write essays, analyze readings, and give peer feedback on presentations.
3. **Case Studies**
   Use case studies to explore real-life examples of communication in business, academic, and casual settings.
4. **Role-Playing and Simulations**
   To practice persuasive speaking, public speaking, and informal conversations.
5. **Technology Integration**
   Use educational apps and software like Google Docs for collaborative writing and peer reviews, and Zoom for virtual presentations.

Assignments: Types and Number with Calendar

1. Quiz-1
2. Quiz-II
3. Presentation
4. Professional Writing Assignments

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Formative assessment includes: 1. Classroom presentations: 10 % 2. Quiz before mid-exam: 5% 3. Quiz before final-exam: 5% 4. Attendance regularity: 5%
3.	Final Assessment	40%	Written Examination at the end of the semester.

Checklist for a New Academic Program

Parameters	YES/NO	
1. Department Mission and Introduction	YES ☐	NO ☐
2. Program Introduction	YES ☐	NO ☐
3. Program Alignment with University Mission	YES ☐	NO ☐
4. Program Objectives	YES ☐	NO ☐
5. Market Need/ Rationale	YES ☐	NO ☐
6. Admission Eligibility Criteria	YES ☐	NO ☐
7. Duration of the Program	YES ☐	NO ☐
8. Assessment Criteria	YES ☐	NO ☐
9. Courses Categorization as per HEC Recommendation	YES ☐	NO ☐
10. Curriculum Difference	YES ☐	NO ☐
11. Study Scheme / Semester-wise Workload	YES ☐	NO ☐
12. Award of Degree	YES ☐	NO ☐
13. Faculty Strength	YES ☐	NO ☐
14. NOC from Professional Councils (if applicable)	YES ☐	NO ☐

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Program Coordinator **Chairperson**