AUDI 22293- Instrumentation for Audiology

Status	**Optional (A)**
No of Hours	45 hours
No of Credits	3
Learning Outcomes	• Identify and describe basic components of essential instrumentation in the field of audiology and its operation • Explain the basics of acoustics related to the field of audiology • Identifying the basic aspects of maintenance, care and calibration of equipment used in the field of audiology
Methods of Teaching and Learning	Lectures, non-assessed practicals
Module content	**Unit 1 : Introduction to electronic devices** • Basic principle of operation and working of - Resisters, potentiometers, capacitors, inductors and transformers - Semiconductor diodes and transistors • Introduction to linear and digital integrated circuits • DC power supply: Block diagram of a DC power supply, description and working of each block • AC power supply: AC voltage stabilizers-manual, automatic and servo controlled • UPS, CVT and invertors • Introduction to electronic instrumentation - Sensors, transducers and electrodes - Filters and preamplifiers - Power amplifiers and oscillators **Unit 2: Fundamentals of acoustics** • Physics of sound - Nature and propagation of sound - Sound characteristics such as frequency and intensity - Wavelength and loudness – sone and phone - Sound pressure level, sound power level • Quality and properties of sound - Frequency response and its control, harmonic structure - Reflection, absorption, acoustic impedance, reverberation • Acoustic treatment - Choosing the right acoustics - Absorption coefficient, Sabine's formula • Sound treatment, reproduction and recording - Microphones – carbon, piezoelectric, moving coil, condenser - Omnidirectional and unidirectional

	- Loudspeaker - Recording and reproduction **Unit 3: Introduction to computers and digital electronics** • Fundamentals of digital electronics - Binary number system, hex code, bit, bite • Introduction to computers - Block diagram of a computer - Hardware, software, memory devices, and other peripherals - Specifications of a personal computer - Care and preventive maintenance of computers and peripherals **Unit 4: Overview of instruments used in audiology** • Hearing aids • Audiometer • Immittance meters • Induction loop meters • OAE analyzer • Safety aspects, care and preventive maintenance of biomedical instruments **Unit 5** • Introduction to digital signal processing • Need for DSP and its advantages over ASP • Analog to digital and digital to analog convertors • Application of DSP in hearing aids
Assessment	SEQ 100% (3 hrs)