



MCAST

Malta College of Arts, Science & Technology

MQF Level 6

**Bachelor of Science (Honours) Health Science
(Physiological Measurements)**

AS6-03-19

Course Specification

Course Description

This programme is intended for students who wish to pursue studies which will provide them with the appropriate competences for the measurement and imaging of the human body's physiological activity. Scientists qualified in this field team up with various other health professionals and provide the diagnostic information which is vital to the medical profession in the treatment of several medical conditions.

This three-year course will provide the learner with the knowledge, clinical training and skills necessary to gain the professional qualifications required to work as a healthcare science practitioner in the area of clinical physiology.

Programme Learning Outcomes

At the end of the programme the learner will be able to:

N/A

Entry Requirements

MCAST-BTEC Extended

Diploma in Health and Social Care (Health Studies)

or

MCAST Diploma for Pharmacy Technicians - Level 4

or

MCAST Advanced Diploma for Pharmacy Technicians

or

2 A-Level passes and 2 I-Level passes

Compulsory A-Level: Biology

Preferred: Chemistry, Physics

Current Approved Programme Structure

Unit Title	ECVET/ECTS
Scientific Basis of Healthcare Science	12
Applied Physics and Measurement	12
Physical Sciences	12
Applied Anatomy ,Physiology and Pathophysiology	12
Professional Practice	12
Clinical Measurement and Treatment	12
Applied Physiological measurement and Instrumentation	12
Research Methods in Health Science	12
Work Based Training in Health Science	12
Biophysics	6
Clinical Practicum	6
Ethical Issues in Decision Making	6
Anatomy and Physiology of the Audio-Vestibular System*	6
Diagnostic Testing in Audiology*	6
Fundamentals of Amplification, auditory implantation and aural rehabilitation*	6
Introduction to Vestibular Disorders*	6
Psychosocial Aspects of Health Care**	6
Respiratory Investigations-Basic Interpretation and Test Modalities**	6
Cardiology Investigations-Basic Interpretation and Test Modalities**	6
Neurophysiological Investigations-Basic Interpretation and Test Modalities**	6
English	6
Critical Thinking	6
Entrepreneurship	6
Dissertation	12
Total ECVET/ECTS	180

*Units for Audiology Stream

**Units for General Physiological Measurements Stream

Scientific Basis for Healthcare Science

Unit level (MQF): 5

Credits: 12

Unit Description

This program introduces the student to the healthcare science profession, combined with a sound grounding in the basic science underpinnings of modern disease diagnostics, evaluation and treatment. Modules will be both practical and theoretical allowing in-depth knowledge that can be used in a health care setting to make informed decisions about patient care and treatment.

Unit content will include basic concepts of health, wellness and preventive care. In depth insight will be given into biochemistry, immunology, microbiology and genetics. Public health medicine, epidemiology and disease control will also be covered, together with exposure to the latest technology and treatment in the field.

By the end of the program students will be expected to be trained in health care professional protocol and be familiar with the ethical and legal responsibilities of today's healthcare provider. They should also be able to understand and use the basics of health protection medical terminology, and have basic life support skills. Research tools including data collection, critical analysis formation and awareness towards new developments in the field of healthcare will also be developed.

Overall, the unit will therefore act as a foundation for students wishing to pursue a career as healthcare science practitioners, by providing the initial exposure to the necessary skills, attitude and know how.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Demonstrate an introductory comprehension of the scientific basis behind health science.*
2. *Outline basic immunology concepts.*
3. *Outline genetic principles and the process of life continuity and variation through genetics.*
4. *Apply knowledge to disease detection and treatment.*
5. *Demonstrate introductory knowledge into pharmacology.*
6. *Demonstrate a proficient understanding of microbiology.*

Applied Physics and Measurement

Unit level (MQF): 5

Credits: 12

Unit Description

This unit introduces the student to the applied physics applications that a healthcare science profession will encounter in various clinical practices. Although theoretical concepts are introduced to provide in-depth knowledge, the focus of the unit is practical applications. Useful statistical techniques are introduced to the student at the start of the unit (learning outcome one) as a way of showing how scientific data is displayed and interpreted. More advanced statistical testing is introduced later as used in various health science scenarios. In learning outcome two, the unit then introduces the forces acting on various sections of the human body. Bones, joints and muscles are analysed using force diagrams. This section ends with a brief description of the mechanics of fluids flow, contextualised to clinical applications.

Learning outcome three introduces the health science student to how radiation is used to examine (diagnosis) and treat patients (therapy). A quantitative description of the radioactivity law as well as half-life is presented before showing how these theoretical ideas are used in radiotherapy. X-ray machines, CAT scans, the gamma camera are all described to show how invaluable information can be obtained about a patient without having to cut the body open. Throughout this unit, the latest safety practiced in the industry is detailed. There are many opportunities for students to carry out simple practical experiments on radioactive substances and demonstrate safe practice when handling radioactive substances. Learning outcome four introduces the properties of light and how light is used in endoscopy to treat patients. A brief introduction to lasers is presented, in the context of clinical practice. Again, there a many opportunities in the section for experimenting with light and contextualising the experiments to clinical practices. Ultrasound imaging and medical treatment is introduced in learning outcome five which also details key measurements in sound. The electrical activity of the human body is described in learning outcome six, with applications of ECG (heart electrical activity) and EEG (brain electrical activity). Opportunities to experiment with electrical components are provided throughout this section. In learning outcome seven, magnetic fields effects are outlined. The principles of Magnetic Resonance Imaging (MRI) are described and how this technique is used to treat patients. The safety consideration in providing imaging with MRI is emphasised.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Demonstrate correct use of statistics to solve health science problems.*

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2. *Describe how mechanics can be used to understand the human body and fluid flow.*
3. *Describe how radioactivity is used to treat patients in clinical practices.*
4. *Explain how light is used in clinical practices.*
5. *Describe applications of sound in clinical practices.*
6. *Explain how electricity is used to monitor electrical activity of patients.*
7. *Describe how magnetism is used in clinical practices.*

Physical Sciences

Unit level (MQF): 5

Credits: 12

Unit Description

This unit provides a wide foundation in physical sciences with an emphasis on health care applications. There are seven learning outcomes due to the breadth of the unit. The first two outcomes may well be almost entirely revision for students coming in with a reasonable previous background in physics and chemistry. These should be introductory in nature as it is expected that the major concepts needed from this unit will be the more advanced materials in the next learning outcomes.

In learning outcome one the student is introduced to mechanics and an understanding developed of important mechanical concepts such as mass, velocity, forces, energy, work, power and pressure.

In learning outcome two the student studies the structure and properties of matter. A study of density and the three states leads on to the atomic theory and a brief introduction to the periodic table including the important groups of elements such as alkali metals, the halogens and noble gases. This can lead on to a basic understanding of atomic structure and bonding, including ionic and covalent bonding. The student moves on to study fluids at rest and in motion. In learning outcome three the student will study electricity and magnetism, including basic electrical circuits.

In learning outcome four the student will study electronics and instrumentation. The outcome begins with a discussion of digital and analogue concepts including bits, resolution and converting between digital and analogue. In learning outcome five the students will study vibrations and waves. This will include the fundamentals of natural and forced vibrations and lead on to resonance.

In learning outcome six the student will study optics and vision. This will introduce the concepts of brightness and colour, as well as spectra and spectroscopy. The quantum nature of light is also discussed to balance the wave treatment, paving the way for a treatment of lasers. Mirrors and lenses are discussed and simple optical instruments such as microscopes studied. Optical fibres and endoscopy are studied. A basic treatment of vision, including eye defects concludes the unit. In learning outcome seven the student will complete the course by studying ionising radiations and medical technologies based on these.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Use the fundamentals of mechanics to solve problems.*
2. *Describe how atomic theory can be used to explain the properties of matter.*
3. *Use concepts of electricity and magnetism in circuits.*
4. *Use concepts of electronics to design simple instrumentation systems.*
5. *Apply fundamentals of vibrations and waves to acoustic and electromagnetic technologies.*
6. *Apply principles of optics to spectroscopy, imaging systems and vision.*
7. *Use concepts of atomic and nuclear physics to describe ionising radiations and therapies.*

Applied Anatomy, Physiology and Pathophysiology

Unit level (MQF): 5

Credits: 12

Unit Description

This course aims to provide the basic underpinning knowledge in behavioural and human biological sciences to support learning in other modules. An introduction will be provided into the basic anatomy of body systems, the physiological functioning of basic units and systems, and on the disease process and treatment of these systems.

The outcome of this course is understanding of the structure and relationship between body parts, the function of these body parts and the body as a whole, and the malfunctions and diseases affecting these systems. The complexities of the cells, tissues, major organs and systems of the human body will be covered in areas related to neural & hormonal homeostatic control mechanisms, as well as the musculoskeletal, circulatory, respiratory, digestive, urinary, immune, reproductive, and endocrine organ systems. Further the pathophysiological disruptions usually related with these systems will also be covered.

Comprehensive and up-to-date information will be provided allowing for advanced human biology knowledge, giving students the opportunity to apply this understanding to related fields as well as for aiding in diagnostic assessment and treatment. Ongoing critical evaluation and analysis of relevant scientific literature from differing sources will also help develop the necessary research skills often used in health sciences areas.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Describe the foundation of cell physiology and function.*
2. *Explain the anatomy and physiological functioning of basic units and systems.*
3. *Explain the role of transport and neural communication systems in regulating organ functions.*
4. *Describe the concept of homeostasis.*
5. *Describe the disease process and treatment in these systems.*
6. *Evaluate and analyse information and relevant scientific literature.*

Professional Practice

Unit level (MQF): 5

Credits: 12

Unit Description

This unit aims to give the learner a greater understanding of the practice of 'care' and how to assess and meet the needs of the individual. The unit will enable learners to develop the knowledge and practical skills which underpin safe and effective practice.

The unit will introduce learners to reflective practice and its role in personal and professional development. The learner will also gain the necessary knowledge and skills to enable them to create action plans that identify personal and professional development needs. In addition to using reflective practice and actions plans the learner will create a portfolio of evidence to validate their learning and continuing professional development.

To become safe working practitioner, the learner must be able to integrate knowledge, theory and practice effectively in a variety of care settings; whilst developing and applying a broad range of specialised vocational knowledge and skills. This unit hopes to prepare them for this role by exposing them to the practice of experienced practitioners and allowing them to then practice these skills in a directly supervised environment.

This requires a work placement experience which will be sourced by the lecturer and allocated to the learner accordingly. There should be a mandatory number of hours for placement which facilitates a general experience of the working environment and will allow the learner time to achieve all learning outcomes and produce their professional portfolio. The placement chosen should benefit both the learner and placement provider with all learning outcomes and mandatory hours clearly set out and discussed before commencement.

This unit also has a practical activity element attached to it which contributes to the overall achievement of the unit.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Discuss the importance of reflection in Personal and Professional Development.*
2. *Develop and evaluate individualised action plans that reflect identified learning needs and goals, (SMART).*
3. *Show safe and effective practice in the delivery of care through participation whilst demonstrating relevant skills to meet the needs of individual service users.*
4. *Create and maintain a portfolio that validates Continuing Personal and Professional Development, (CPD).*

Clinical Measurement and Treatment

Unit level (MQF): 5

Credits: 12

Unit Description

This course is designed to provide integrated training in the area of Clinical Measurement and Treatment. Students are taught to measure and image the physiological activity of the human body and to provide diagnostic information. Focus is on the instruments used for measurement and diagnosis, their characteristics, underlying functioning and application on patients.

The practical and theoretical coursework covers advanced concepts in physiological measurement instrumentation, including current state of the art technology and its application in the areas of cardiology, neurophysiology, pulmonary function and vascular measurements. Guided by in depth teaching of the physiology, anatomy and biochemistry of the body, students will learn how to contribute to the effective diagnosis and treatment of patients following instrument based diagnostic measures in the above areas.

Upon completion of the unit students should be able to outline the physical and safety principles of specific instruments. These will include ECG, EEG, and fMRI amongst others. Students should also be able to properly read and interpret measurements from these instruments, and advise appropriate management of these instruments accordingly. Finally, students should be applying to apply this knowhow to aid in condition diagnosis and to inform treatment options in case study scenarios.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Express an introductory understanding of clinical measurement and treatment.*
2. *Outline common disorders or conditions and then evaluate the available treatment or management in the areas related to vascular cardiology, neurophysiology and respiration.*
3. *Demonstrate in-depth understanding of the clinical measurements used in cardiology.*
4. *Demonstrate in-depth understanding of the clinical measurements used in neurophysiology.*
5. *Demonstrate in-depth understanding of the clinical measurements used for vascular measurement.*
6. *Demonstrate in- depth understanding of the clinical measurements used for pulmonary function.*

Applied Physiological Measurement and Instrumentation

Unit level (MQF): 5

Credits: 12

Unit Description

This unit aims to provide the basic underpinning knowledge in the methods and physics behind physiological measurement and instrumentation used. This unit will provide all the basics applied in the measurement of human physiological parameters used in healthcare.

The outcome of this unit is understanding the physics behind several methodologies and applying them to measure physiological parameters. This will require basic knowledge on human physiology as supported and delivered in other modules. Physiological measurement will mainly focus on bio-sensors, transducers and other associated equipment used to measure and record signals deriving from various parts of the human body. These signals are generally linked with chemical, electrical or mechanical changes within the investigated part. Generalised models of medical instrumentation will be discussed and explored during delivery of this unit with a focus on each functional part of the instrument. Throughout the delivery of this unit, state-of the art technology will be used as a reference model for each instrument explored. A focus on how physiological signals mainly from the nervous, circulatory, muscular and respiratory systems may be recorded using physical parameter changes (electrical, chemical, pressure, flow, volume, etc.) will be done. This unit will also deal with how recorded signals can be further used in clinical investigation, diagnosis and disease/disorder management.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Demonstrate an introductory understanding of physiological measurement.*
2. *Describe how electrical potentials are detected by biomedical instruments, and how these instruments enable treatment.*
3. *Describe how physiological pressure is measured by biomedical instruments, and how these instruments enable treatment.*
4. *Explain how mechanical waves are detected by biomedical instruments, and how these instruments enable treatment.*
5. *Describe how physiological gas variables are measured using biomedical instruments, and how these instruments enable treatment.*
6. *Explain how temperature is measured using biomedical instruments, and how these instruments enable treatment.*

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7. *Describe how brain structure and function is measured through imaging techniques.*

Research Methods in Health Science

Unit level (MQF): 5

Credits: 12

Unit Description

This unit will cover aspects of research methods used in health sciences research. The aim is to introduce students to research and develop their understanding and skills in both quantitative and qualitative research methods. Students in this module will be introduced to the research process and apply different methodologies, data collecting tools and conceptual frameworks.

In this study-unit students will cover how to methodologically adopt the appropriate research design to specific research questions using experimental, quasi-experimental, descriptive and epidemiological methods. Qualitative data collection designs to be introduced include archival studies, interviews and case studies. The syllabus also covers the challenges of various data collection techniques as well as the measurement issues of questionnaire development, reliability and validity of data, issues of sampling and of sampling size.

The quantitative part of the unit will address research questions in terms of statistical concepts. The aim is to have students confident with using descriptive statistics, estimation and confidence intervals and inferential statistical tests such as chi-square, t-tests and ANOVAS for both parametric and non-parametric data. Skills in using statistical software such as SPSS will also be developed.

Following completion of these unit students should be familiar with all parts of the research process including funding application, ethics and publication. Tools will be provided for the student to individually formulate a research question and carry out a research project.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Identify and describe the main stages of the research process.*
2. *Select the appropriate research design for a particular research question.*
3. *Apply and understand issues of reliability, validity, bias and sampling.*
4. *Demonstrate skills using qualitative methodologies.*
5. *Demonstrate skills using quantitative methodologies.*
6. *Demonstrate and respect the ethical issues and responsibilities in health sciences.*

Work-based Training in Health Science

Unit level (MQF): 5

Credits: 12

Unit Description

This unit is designed to bridge school education and the workplace, through supervised work placements in the health care setting. Students will be given the opportunity to develop and hone employability skills whilst putting what they've learnt into practice. The unit will train the learner to prepare and plan the work day, to organise information effectively and to take charge of one's own learning and progress. Group work skills will also improve as students learn to work under supervision and work as a multidisciplinary health care team. Learners will be able to develop interpersonal skills such as effective communication and listening tools. This experience will allow students the opportunity to practice interacting with patients, carrying out standard medical procedures and using medical health care instruments. The placement will provide insight into the pressures of the health care work place, hopefully motivating the learner to take charge and come up with problem solving strategies. The portfolio that students keep of this experience will permit them to reflect on their performance, evaluating their strengths and deficits and seeing which areas and skills need the most improvement. This exercise might also help determine the career path that students take, perhaps influencing subject choices, career goals and focuses.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Demonstrate comprehension of placement requisites.*
2. *Generate and hone interpersonal and transferrable skills.*
3. *Demonstrate ability to work within the dynamics of a multi-disciplinary team.*
4. *Evaluate and reflect on the work experience and its influence on career choice.*

Biophysics

Unit level (MQF): 6

Credits: 6

Unit Description

This unit covers the physics of the biological systems governing human physiology with respect to areas that are relevant to the final year of the BSc Physiological Measurement Course. The scope is to consolidate and fulfil the most relevant areas that may be encountered in the future jobs targeted by this course. It also serves as a foundation for other units in this course including *The Anatomy & Physiology of the Audio-vestibular System*, *Diagnosing testing in Audiology* and *Fundamentals of amplification, auditory implantation & rehabilitation*.

Four main themes will be studied i.e. the physics of electricity which will be applied to nervous and muscular action including cardiac muscle action; the physics of pressure governing the cardiovascular and respiratory systems; the physics of sound with respect to the auditory system and the physics behind important devices or tools or procedures used in this job.

The emphasis is on student self-learning and research by encouraging the students to use their own researched material and to actively participate in critical discussions about material covered.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Understand the basic electrical principles relevant to the health sector & the electrical activity of nerves & muscles.*
2. *Correlate the physics of pressure with the normal functioning of the cardiovascular and respiratory systems.*
3. *Examine the physics of sound underlying the human auditory system.*
4. *Evaluate the function and effectiveness of some common technological devices and/or procedures used in the cardiac and audiology hospital departments.*

Clinical Practicum

Unit level (MQF): 6

Credits: 6

Unit Description

This module will provide the learner with didactic and experiential learning in the area of physiological measurements, including the application of the care process and model to simple and complex medical conditions. Learners will complete a minimum of 60 hours of theoretical and/or experiential learning. In this manner, the learner will have gained an understanding of the role of the physiological measurements practitioner in a multi-disciplinary healthcare team.

By the end of the course, learners will have to present their experiential learning in the form of a log book as indicated in the module lead.

The unit will therefore assist the learners in developing knowledge and skills that are needed to provide assessment with a variety of disorders across the life span. It will also assist to develop the relevant communication skills needed, as well as further developing professional writing skills.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Perform and observe a wide range of investigation techniques.*
2. *Present information effectively to communicate ideas clearly.*
3. *Carry out scientific research related to evidence-based practice.*
4. *Appraise and synthesise information to gain new insights into aspects of current practice.*

Ethical Issues in Decision Making

Unit level (MQF): 6

Credits: 6

Unit Description

The course is designed to provide an overall insight into concepts of ethical issues and decision making. It targets the interface of decision making and ethics, showing the consideration that must be brought to bear for decision to be an ethical one. It merges the knowledge of philosophy of ethics with the management of science of decision making and applies the result to daily decision problems in Health and Social Care. In order to be able to target this interface and to merge the philosophy of ethics with the science of decision making the course needs to cover both topics separately.

This is why the course will firstly start with an introduction of theory-based knowledge in order to provide students with basic understanding of what ethics is in everyday and professional life. The participants will also get introduced with ethical principles and types of ethics which will be explored in order to get understanding of the divine and natural law ethics, utilitarian and deontological ethics. The course will continue in explaining moral rules such as veracity, privacy, fidelity and confidentiality, and moral principles such as respect for autonomy, non-maleficence, beneficence and justice.

The ethical guidelines and professional codes of different Health and Social Care Professions shall be investigated with a particular focus on the ethical guidelines available for Health and Social Workers. Bioethics, or as it is sometimes called medical ethics will be covered more deeply through the mentioned rules, principles and guidelines, since in addition to the above mentioned this module is aimed to explore complex ethical issues and problems. Some of these include: genetic diagnostic testing, cloning and stem cell research, gene therapy and nanotechnology, patenting with respect to GMO's products, pharmaceuticals and genetic resources, beginning as well as end of life issues, issues of aging, organ transplant and ICT implants.

The students will also have the opportunity to explore the principle of double effect such as uterine cancer and ectopic pregnancy, ordinary/extraordinary treatments, fundamental human rights, absolute versus non-absolute rights, personhood versus being and the status of the human embryo.

Afterwards the first section, participants will get acquainted with different types of decisions we all make every day and will have to consider different models of decision making. The distinction between decision making and problem solving will be tackled and the process of systematic approach to methods of reaching a decision will be introduced. As well the participants will be able to learn the decision making techniques.

Finally, an evaluation of how making choices and decision can have impact on ethical issues shall be appraised. The way in which ethical issues influence decision-making strategies shall also be considered. Legal aspects and legislation related to data protection, anti-discriminatory practice, protection of vulnerable people, professional liability and indemnity shall be covered.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Demonstrate a general understanding of ethics and ethical principles.*
2. *Apply practical knowledge in decision making process.*
3. *Examine, investigate and make choices about various ethical problems.*
4. *Critically discuss various ethical issues.*

Anatomy and Physiology of the Audio-Vestibular System

Unit level (MQF): 6

Credits: 6

Unit Description

This unit aims at providing an understanding of the anatomy and physiology of the audio-vestibular system. This unit will introduce the anatomy and function of the main parts of the audio-vestibular system. Students will also be exposed to the main cellular and neurophysiological mechanisms which are involved in the hearing system. Students will be introduced to the main mechanisms of hearing loss.

The outcome of this unit is the understanding of the anatomy and physiology of the main parts of the hearing system including: the outer ear, the middle ear, the cochlea, the auditory nerve, auditory brainstem, and the auditory cortex. This unit will also focus on the auditory pathway and the physiology behind structural hearing loss. Throughout the teaching of this unit, students will be kept in close contact with latest scientific findings. Continuing evaluation of current scientific findings will allow students to develop further knowledge in the anatomy and physiology of the audio-vestibular system, and assist their development as scientific researchers.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Evaluate the basic aspects and cellular functions involved in hearing and development of the audio-vestibular system.*
2. *Understand the Anatomy and Physiology of the basic components of the audio-vestibular system.*
3. *Explain the mechanism involved in the development of the main structures of the audio-vestibular system.*
4. *Outline the anatomical and physiological changes involved in structural damage of the audio-vestibular system, resulting in temporary or permanent hearing loss.*

Diagnostic Testing in Audiology

Unit level (MQF): 6

Credits: 6

Unit Description

This unit aims at providing basic knowledge of diagnostic testing in audiology. Through this unit, students will be introduced to the common causes of hearing loss, the basic aspects of clinical examination, the requirements for diagnostic testing and interpretation of results acquired from audio logical testing. Students will also be trained in structuring an effective audio logical appointment and in effective case history taking.

The outcome of this unit is the understanding of the main concepts of diagnostic tests carried out in the field of audiology. Following this unit, students should be able to: identify the common causes of hearing loss in both adult and paediatric patients, select and administer appropriate audio logical assessments and adequately interpret these test results.

Throughout the teaching of this unit, students will be kept in close contact with latest scientific findings and speculations. Students will also be given the opportunity to apply their knowledge through the presentation of clinical case studies with various audio logical test results which they will be asked to interpret. Continuing evaluation of current scientific literature will allow students to develop further knowledge in diagnostic audiology, and assist their development as scientific researchers.

Learning Outcomes

On completion of this unit the student will be able to:

- 1. Define hearing loss in terms of: cause, type, severity, and site of impairment.*
- 2. Carry out a first appointment (initial interview, case history taking, clinical examination) and use outcomes to structure the Audiology Appointment.*
- 3. Master the administration of diagnostic audio logical tests, interpret test results, and effectively communicate outcomes.*
- 4. Understand the necessity of audio logical testing in the paediatric age group and administer required diagnostic audio logical tests.*

Fundamentals of Amplification, Auditory Implantation, and Aural Rehabilitation

Unit level (MQF): 6

Credits: 6

Unit Description

This module aims at introducing the technology options available in the rehabilitation of individuals with hearing difficulties. Through this module, students will be introduced to the various amplification opportunities which are available for individuals with hearing difficulties. Students will also be exposed to methods which enable successful rehabilitative amplification. Students will be trained in identifying the adequate option for patients with hearing difficulties.

The outcome of this module is to introduce the various technologies used in the treatment of hearing loss including hearing aids and implantable devices. Following this module, students should be able to identify ideal technology for assisting individuals with hearing difficulties, whilst also establishing a framework of rehabilitation which tackles the hearing impaired individual's clinical needs in a holistic manner.

During this module, students will be kept in close contact with the latest technological advances in treating hearing difficulties, and scientific findings. Students will also be given the opportunity to apply their knowledge through the presentation of clinical case studies. Continuing evaluation of current scientific literature will allow students to develop further knowledge in amplification and rehabilitative audiology, and assist their development as scientific researchers.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Understand the various treatment options for individuals with hearing loss, including; hearing instruments, implantable devices, aural rehabilitation techniques and Assistive Listening Devices (ALDs).*
2. *Understand the selection criteria, verification and validation procedures involved in the amplification/implantation route.*
3. *Describe a framework of aural rehabilitation which holistically treats hearing impaired individuals and their communication partners.*
4. *Create awareness on counselling tools which enhance perception and deal with emotional impacts of hearing impairment.*

Introduction to Vestibular Disorders

Unit level (MQF): 6

Credits: 6

Unit Description

This unit will provide students with a general understanding of the vestibular system, system dysfunction and the options available to a clinician with regards to functional measurement and treatment. There are four learning outcomes, encompassing the whole spectrum required for working in this field of study. The first two outcomes deal with how the system functions (normally and abnormally) and the different conditions that may be encountered. Later on, students will be taken through vestibular functional measurement and treatment options.

In outcome one, students will be introduced to the anatomy of the human balance system. This section shall initially discuss the balance system in general, however emphasis will then be placed on the peripheral vestibular sensory system, which is of interest to the Audiology stream. Physiology shall be emphasised so that students will be able to explain the function of each part of the anatomy.

In outcome two, abnormal function shall be examined in detail. This will be linked to anatomy, so that students can explain what is happening during dysfunction. This will be discussed in terms of the most common vestibular disorders. Students shall be expected to define these disorders and also explain their main characteristics.

In outcome three, bedside and laboratory vestibular tests shall be identified and discussed in detail. Each test shall be discussed in terms of what it measures and how it measures it. Students will then be taught how to choose which test to use when faced with a patient. At the end of the course, students will be expected to know how to choose a battery of tests for a vestibular patient.

In outcome four, possible treatment options for the treatment of vestibular patients shall be examined. Although students will not be expected to skilfully administer treatment themselves, they will be expected to evaluate potential treatment options for particular vestibular disorders.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Identify and describe the different components in the human balance system, explaining their role and function.*

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2. *Define the most common vestibular disorders and explain their main characteristics.*
3. *Develop a battery of tests based on patient symptoms using bedside and laboratory vestibular tests.*
4. *Evaluate different treatment options available for vestibular patients.*

Psychosocial Aspects of Health Care

Unit level (MQF): 6

Credits: 6

Unit Description

This unit introduces students to the psychosocial aspect of health and well-being. Understanding health as more than biological wellness has been a challenge in the medical community. However, there is now increasing recognition of health as a result of the interaction of biological, psychological and social influences. For this reason, a holistic approach including the biopsychosocial aspect of health and well-being will be adopted throughout the unit. Different psychological approaches and relevant aspects within Health Psychology will be explored.

The Unit focuses on different definitions of health and on understanding the patient in a holistic way. The focus is on how the biological, psychological and social aspects interact to influence a person's health and well-being. A deeper analysis of the psychological influences on health will then be carried out, with focus on mental health conditions, particularly those where physical and psychological symptoms interact to affect the patient's health and well-being. Possible explanations for these effects will be examined using the Psychodynamic, Biological, Cognitive and Social perspectives within psychology. An outline of available treatments will be provided. Psychological factors affecting the course of the disease and the effectiveness of treatment will also be discussed.

The last part of the Unit will focus on patient centred care and on the importance of holistic health care delivery. The best ways of supporting patients while considering their psychosocial well-being will be discussed. These include communication skills and values relevant to health settings. A Humanistic perspective will be adopted in examining how patients can best be supported. The issues of referral and burnout in relation to the health care provider will also be discussed.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Adopt a holistic approach when examining a patient's health based on the biopsychosocial perspective.*
2. *Explain psychological influences on health, including mental health.*
3. *Analyse how psychological factors affect the course of disease and the effects of treatment.*
4. *Explain how patients' psychosocial well-being should be supported.*

Respiratory Investigations-Basic Interpretation & Test Modalities

Unit level (MQF): 6

Credits: 6

Unit Description

This unit covers the diversity of tests used for diagnosing the most common disorders of the respiratory system. It serves as a consolidating study of the respiratory system in which the students finally integrate the knowledge they have gathered from other units throughout their course and to prepare them fully for their future jobs in the health care sector.

The first theme includes a detailed revision of the anatomy and physiology of the respiratory system together with a classification of the main pathologies. The next three themes include the various respiratory investigations and test modalities including spirometry, blood gas measurements and other related tests.

The emphasis is on student self-learning and research by encouraging the students to use their own researched material and to participate and build the lessons through PowerPoint presentations and discussions.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Establish a detailed relationship between the structure and function of the respiratory system including the identification of the common related pathologies.*
2. *Evaluate the use of spirometry testing in respiratory investigations.*
3. *Examine the relationship between blood gas measurements and respiratory function both normal and abnormal.*
4. *Appraise the need for other Lung Function tests for the proper diagnosis of respiratory disorders.*

Cardiology Investigations-Basic Interpretation & Test Modalities

Unit level (MQF): 6

Credits: 6

Unit Description

This unit builds on the skills and knowledge acquired in previous units covering cardiac anatomy and physiology as well as in the spectrum of cardiology investigations and instrumentation. Students will explore the principles and practice of a range of non-invasive and invasive cardiac investigations.

The outcome of this unit is the understanding of the principles of a range of physiological measurements cardiac investigations, to critically analyse the acquired data and construct provisional diagnosis related to the Pathophysiology related to Chronic Ischemic Heart Disease; Acute coronary syndromes; congenital heart disease and structural heart disease and Cardiac arrhythmias which is to be presented constructively to Senior officers and Cardiologists.

Learning Outcomes

On completion of this unit the student will be able to:

- 1. Understand the objectives for various diagnostic and investigational physiological measurement procedures.*
- 2. Describe the methodology of acquiring diagnostic and investigational data. Instrumentation process and calibration techniques for basic physiological measurement procedures.*
- 3. Process and critically analyse the acquired data to attain a differential diagnosis.*
- 4. Understand the process of procedures and investigations and the different roles of the team members.*

Neurophysiological Investigations-Basic Interpretation & Test Modalities

Unit level (MQF): 6

Credits: 6

Unit Description

This unit aims to provide a basic knowledge in human neurology and neurophysiology allowing one to grasp a basic understanding of the subject matter and to use it as a base for learning other medical subjects.

An introduction will be provided into the neurophysiological functioning of basic body units and systems, and on applied neurology/pathology of these systems.

The outcome of this course is to lead one to understanding the function of human neurology and its application as a whole, and some pathologies affecting these systems. The complexities of the cells, tissues, major organs and systems comprising human neurology will be covered in areas related to physiology, anatomy and pathology of the respective systems and disorders. The focus will comprise clinical neurology, electroencephalography, evoked potential studies and electromyography.

Comprehensive and up-to-date information will be provided allowing for advanced human neurophysiology and neuropathology knowledge, giving students the opportunity to apply this understanding to other related fields as well as for aiding in diagnostic assessment and treatment.

Learning Outcomes

On completion of this unit the student will be able to:

1. *Describe the foundation of neurological examination and some main pathologies seen in clinical neurology.*
2. *Identify normal patterns and pathological use and interpretation of electroencephalography.*
3. *Understand the uses of evoked potential studies.*
4. *Identify normal patterns and pathological use and applications of electromyography.*