PROGRAMME STANDARDS:
MEDICAL AND HEALTH SCIENCE

CONTENTS

FOREWORD

In its effort to ensure the quality of programmes in institutions of higher learning in Malaysia, Malaysian Qualifications Agency (MQA) has published various documents such as Malaysian Qualifications Framework (MQF), Code of Practice for Programme Accreditation (COPPA), Code of Practice for Institutional Audit (COPIA), Guidelines to Good Practices (GGP) and Programme Standards (PS). It is important that these quality assurance documents be read together with this document in developing and delivering higher education programmes in Malaysia.

The Programme Standards document outlines sets of characteristics that describe and represent guidelines on the minimum levels of acceptable practices that cover all the nine Malaysian quality assurance areas: programme aims and learning outcomes, curriculum design and delivery, assessment of students, student selection, academic staff, educational resources, programme monitoring and review, leadership, governance and administration, and continual quality improvement. The Programme Standards: Medical and Health Sciences cover all the education levels: from diploma to doctoral.

This Programme Standards document has been developed by a panel (Appendix1) in consultation with various stakeholders representing public and private Higher Education Providers (HEPs), relevant government and statutory agencies, professional bodies, related Medical and Health Sciences industry and students.

This standards do not attempt to give specific characteristics for the programmes, especially for those related to the framing of the curricula and provision of educational resources. This Programme Standards document encourages diversity and allows programme providers to be innovative and to be able to customise their programmes in order to create their own niches, while ensuring they produce graduates that meet the current needs of the profession and ensuring they fulfil their obligations to society. Some examples given in this Programme Standards document, such as the statements of programme aims and learning outcomes, are intended to give clarity to the document; they are not intended to be adopted in a verbatim manner.

I would like to express my appreciation to all the panel members, the various stakeholders who have given their input, and all the officers from MQA who have contributed to the development of this Programme Standards: Medical and Health Sciences document.

Thank you.

Dato' Prof Dr. Rujhan Mustafa
Chief Executive Officer
Malaysian Qualifications Agency (MQA)
2015

GLOSSARY

Clinical Instructor   Clinical Instructor is appointed by HEP

Compulsory module   Module that is taken to fulfil university and national requirements.

Formative assessment   A process of monitoring the achievement of the learning outcomes. It involves evaluating student learning that aids understanding and development of knowledge, skills and abilities without passing any final judgement (via recorded grade) on the level of learning.

Fundamental module   Module that is deemed common to all subgroups of Medical and Health Sciences by this Programme Standards.

Graduate   A student who has successfully completed any level of qualification within this Programme Standards.

Industrial training   A period of time within the programme where students are required to be placed in the industry to gain industrial experience and enhance soft skills. It also includes Clinical/ Professional/Supervised Professional Placement.

Local Preceptor   Local Preceptor is appointed by faculty from the relevant institution for attachment

Medical and health sciences   Disciplines that are built upon the basic sciences and fundamental biomedical sciences and deal with better understanding and improving the health of individuals and community as identified in this Programme Standards.

Module   A unit of learning and teaching also described as subject or course or unit in a programme.

Optional module   A module which is selected by a student from a group of identified modules which form part of the Minimum Graduating Credits for the programme. These may either be as free electives or field electives.

Professional module   Modules taken to fulfil the requirements within an identified/ specific subgroup of Medical and Health Sciences.

Programme   An arrangement of modules that are structured within a specified duration and learning volume to achieve the stated learning outcomes, which usually leads to an award of qualification.

Summative assessment   A process of evaluating and grading the learning of students at a point in time.

ABBREVIATIONS

A-Level	Advanced Level
APEL	Accreditation of Prior Experiential Learning
CGPA	Cumulative Grade Point Average
COPIA	Code of Practice for Institutional Audit
COPPA	Code of Practice for Programme Accreditation
CPD	Continuous Professional Development
GCE	General Certificate of Education
GGP	Guidelines to Good Practices
HEP	Higher Education Provider
IELTS	*International English Language Testing System*
MCQ	Multiple Choice Questions
MEQ	Mixed Essay Questions
MGC	Minimum Graduating Credits
MOHE	Malaysian Ministry of Higher Education
MQA	Malaysian Qualifications Agency
MQF	Malaysian Qualifications Framework
O-Level	*Ordinary Level*
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
RPL	Recognition of Prior Learning
SEQ	Short Essay Questions
SPM	Sijil Pelajaran Malaysia
STPM	Sijil Tinggi Persekolahan Malaysia
TOEFL	*Test of English as a Foreign Language*

INTRODUCTION

The Programme Standards document contains benchmark statements pertaining to the field of medical and health sciences. It provides guidelines for HEP to follow in curriculum development and minimum level of acceptable practices. The programme standards cover all education levels from diploma to doctoral in medical and health sciences.

The standards for the following disciplines have been developed by the panel for medical and health sciences in 2010 (published in the first edition of programme standards):

1. Audiology
2. Biochemistry
3. Biomedical Sciences
4. Dietetics
5. Environmental Health
6. Forensic Science
7. Genetics
8. Health Care Management
9. Health Promotion
10. Medical Imaging
11. Medical Laboratory Technology
12. Medical Social Work
13. Microbiology
14. Nutrition
15. Occupational Safety and Health
16. Occupational Therapy
17. Physiotherapy
18. Radiotherapy
19. Speech Sciences

To ensure the quality of each programme is maintained, it is the requirement of MQA to review each programme standard once in every five years. In 2015 a panel of reviewer was appointed to review and update taking cognisant of current policies and development.

The panel reviewed 11 out of 19 disciplines, they are

1. Biomedical Sciences
2. Dietetics

3. Environmental Health
4. Health Care Management
5. Medical Imaging
6. Medical Laboratory Technology
7. Nutrition
8. Occupational Safety and Health
9. Occupational Therapy
10. Physiotherapy
11. Radiotherapy

The three new disciplines (audiology, forensic and speech sciences) were introduced in 2012 and were not yet due for reviewing by the present panel. The remaining five disciplines (Health promotion, microbiology, biochemistry, medical social work and genetic) have not been reviewed because of the lack of demand. A new standard is developed for paramedical science.

In 2019, Speech Sciences discipline was revised based on stakeholder's feedback. Standards for Speech Sciences is included throughout this document.

Biomedical Science

Biomedical Sciences can be defined as the application of biology-based sciences in the field of medicine, health sciences, biomedical science research, in laboratory sciences for diagnostics and research.

The Biomedical Science program is multidisciplinary in nature and exposes students to the latest information and technology in the fields of medical and health sciences. The program covers understanding of the principles in a wide range of biomedical disciplines, including anatomy, physiology, biochemistry, molecular biology, biophysics, cell biology, cytopathology, computational biology and bioinformatics, developmental biology, epidemiology, genetics, hematology, histopathology: immunology, microbiology, neuroscience, oncology, parasitology, pathology, pharmacology, physiology and virology

Biomedical science is a continually changing and dynamic profession and it offers a variety of exciting career opportunities. Graduates are qualified to enter a variety of careers in pharmaceuticals, biomedical, agrochemicals, government service, specialist laboratory work, expert and consultant roles, research, education, management, including science policy and

enforcement agencies. Graduates also have the option to continue their studies to postgraduate studies (Masters or PhD) and pursue a career in research and teaching. Graduates are competent to establish specialised laboratories catering to DNA sequencing, peptide synthesis, protein purification and marketing various chemicals, enzymes, antibodies and other products. Those having managerial skills and financial backups can venture into business to set up clinical and research laboratories.

Medical Laboratory Technology

Medical laboratory technology can be defined as the application of technical and scientific knowledge in the health-care with strengths in clinical laboratory techniques and procedures. A medical laboratory technologist is a healthcare professional who exercises technical and scientific functions in medical laboratories. They collect samples and perform tests to analyse body fluids, tissue, and other substances. In some countries, medical laboratory technologists may be called biomedical scientists, medical laboratory scientists or clinical laboratory scientists.

These highly trained health-care professionals provide patient care through the performance of laboratory analysis and procedures in all areas of laboratory medicine. Most medical laboratory technologists are generalists, skilled in all areas of the clinical laboratory. However some are specialists, qualified by unique undergraduate education or additional training to perform more complex analyses than usual within a specific field. Specialties include clinical biochemistry, hematology, microbiology, bacteriology, toxicology, virology, parasitology, mycology, immunology, immunohematology (blood bank), histopathology, histocompatibility, cytopathology, genetics, cytogenetics, electron microscopy, molecular diagnostics and *in vitro* fertilization (IVF)

They perform a full range of laboratory tests – from simple prenatal blood tests, to more complex tests to uncover diseases such as HIV/AIDS, diabetes, and cancer. They are also responsible for confirming the accuracy of test results, and reporting laboratory findings to pathologists and other physicians. The information that a Medical Laboratory Technologist gives to the doctor influences the medical treatment a patient will receive. Medical Laboratory Technologists operate complex electronic equipment, computers, and precision instruments costing millions of dollars. Medical Laboratory technologists also assist doctors and nurses in choosing the correct lab tests and ensure proper collection methods. Medical Laboratory Technologists perform, develop, evaluate, correlate and assure accuracy and validity of laboratory information and ensures maintenance procedures in laboratory instrumentation.

Graduates are qualified to work in hospital laboratories, research laboratories, clinical laboratories, private pathology laboratories, public health laboratories, university laboratories, sales and marketing, public schools and in many other areas. Medical Laboratory Technologist also have the option to continue their studies to postgraduate studies (Masters or PhD) and to venture into business to set diagnostic laboratory, quality assurance, academia and provide consultancy.

Dietetics

Dietetics is an essential component of the health sciences emphasising on providing dietetics services in hospital, clinical setting and community.

The work of the dietitian includes prescribing medical nutrition therapy; providing dietary consultation for treatment of diseases/illnesses in both acute and chronic care.

A dietitian also assesses nutritional needs of individuals or community groups; manage food service; conduct research in nutrition, dietetics and food services.

In addition, a dietitian involves in developing policies, protocols, clinical practice guidelines, medical nutrition therapy guidelines; providing expertise in the promotion of wellness through healthy eating and health-related programme to support the healthcare needs of the population in a clinical setting.

A dietitian must understand biochemical, physiological and psychological factors that relate to human nutrition in health and disease, principles of education and communication and principles of organisation and management. Dietitians are trained to:

- understand food science
- interpret nutrition science
- assess people's nutritional needs
- conduct diet counselling
- prescribe diets for medical conditions
- implement and manage nutrition services and health promotion programmes
- undertake research
- deliver evidence-based nutrition care
- undertake development of nutrition and dietetic policies

Dietitians are employed in hospitals and clinical settings. They also serve the public as Community Dietitians.

Dietitians are able to work as food and beverage managers in food service institutions, as consultant dietitians, as well as in pharmaceutical companies as special products managers. Those with tertiary education can become academic dietitians. They can also provide their expertise in schools, homecare, airlines, hotels, sports and long term care facilities.

Environmental Health

Environmental health comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social, and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations. It comprises:

1. Epidemiology and biostatistics
2. Environmental toxicology, health impacts and risk assessment
3. Built environment and environmental technology
4. Ethics, law and enforcement of appropriate legislation to protect health
5. Occupational safety and health
6. Food hygiene and safety
7. Air and water quality
8. Vector and pest control management
9. Hazardous and municipal waste management
10. Environmental hazards, disaster and emergency management
11. Transboundary and international health issue

Development is looked at in the perspective of natural ecosystem – in saving resources and minimising adverse effects to lives and total environment. Hazards resulting from development and man-made environment are studied and monitored to promote global sustainability in consumption and production. Environmental issues like global climatic change, ozone depletion and scarcity of resources and contamination of the environment are studied.

Candidates in this field would study, among other things, basics of health sciences – chemistry, biochemistry, biology, microbiology, human anatomy and physiology, and statistics; as well as related diseases and disease control, laws, ecology, pollution, environmental

assessments, land use and housing, environmental toxicology, environmental health promotion, occupational health and industrial hygiene.

Graduates in this field should be able to work as environmental health officers; health, safety and environment practitioners; industrial hygienists; academicians; researchers; and consultants in this field.

Health Care Management

Health care management is the field relating to leadership, management and administration of health care systems, hospitals and hospital networks. Health care administrators are health management professionals who provide administrative/management support for the delivery of healthcare services.

The health care management professionals are equipped with specialized education in management disciplines taught in the health care context. They have knowledge and skills in finance, budgeting, human resource, health facilities management, organizational behaviour, quality of health care services, health information management and technology; and medical and health terminology for effective communication.

Healthcare management professional requires to respond to and support changes in healthcare delivery services. Managing facilities, services, programs, human resources, finance, quality, and relations with other organizations are some significant roles and responsibilities of healthcare management professionals. Their roles make significant contribution to community.

With growing diversity in the healthcare systems, health care management professionals may present in a variety of setting in health and other organisations including health service providers (clinics and hospitals), health support organizations, managed care organizations, consulting firms, public health departments in an organization and learning organisations.

Medical Imaging

Medical Imaging is a technique, process and art of creating visual representations of body parts for clinical analysis and medical intervention. This non-invasive technique may reveal the condition of internal structures without surgical intervention.

Modalities in medical imaging include General radiography, angiography, Computed Tomography, Ultrasound, Magnetic Resonance Imaging, Radionuclide Imaging and Mammography. Many of the medical imaging modalities are using man made radiation as a source of energy. Meanwhile Ultrasound and Magnetic Resonance Imaging are using the principle of magnet, sound and radiofrequency. Medical imaging program provides student with knowledge, skills and competencies to carry out examinations or procedures with specific modalities. Courses in the programme includes, Image recording and processing principles, patient care and safety), communication and handling issues, human anatomy and pathology, instrumentation management and handling, and radiation safety principles. Management and leadership toward appropriate attitude are compulsory in developing professionalism in this field.

Teaching approaches include theory, practical and clinical environment. Graduates from this field will be working in healthcare facilities, diagnostic centre, research laboratory and healthcare companies.

Duties of a medical imaging technologist (MIT)
Diagnostic Radiographer are responsible for preparing and ensuring safe and correct positioning of patient to get the most accurate images, assisting a radiologist in procedures and advanced preparation as well as administrative tasks, such as organizing work schedules and maintaining patient records.

A Diagnostic Radiographer may specialize in mammography, computed tomography, ultrasound and magnetic resonance imaging. The Diagnostic Radiographer may require to work shift and on-call duty.

Sonographers are Diagnostic Diagnostic Radiographer who specialise in ultrasound, to conduct imaging procedures using non-invasive sound waves to obtain images of the internal and external structures. Sonographers can further specialise in women's health, vascular technology, and echocardiography.

Nutrition

Nutrition is the science of food and nutrients, their uses, processes in the body in relation to health and disease. A nutritionist is involved in one or more of the following areas of work such as in public health, research, academia, food industry and communication and media. The

role of the nutritionist includes implementing, promoting, and evaluating nutrition programmes and projects.

The nutritionist is also involved in developing nutrition guidelines and recommendations; participating in applied or basic research activities. In addition, nutritionist also educate and empower consumers on nutrition and products, write and communicate nutrition knowledge to the community, public and policy maker through the media and other means as well as provide training and consultation in nutrition. Nutritionists also promote the nutrition wellbeing of the community and prevent nutrition related diseases.

Occupational Safety and Health

Occupational safety and health is a field which ensure safe and healthy working conditions at the workplace. This discipline safeguard that all hazardous agents and factors such as physical, chemical, ergonomics, biological as well as psychosocial in addition to occupational accidents will be avoided.

It has gradually developed from a mono-disciplinary, risk-oriented activity to a multi-disciplinary and comprehensive approach that considers an individual's physical, mental and social well-being, general health and personal development.

Occupational safety and health is a multidisciplinary activity aimed at:
  i.   the protection and promotion of the health of workers by preventing and controlling occupational diseases and accidents and by eliminating occupational factors and conditions hazardous to health and safety at work;
  ii.   the development and promotion of healthy and safe work, work environments and work organizations;
  iii. the enhancement of the physical, mental and social well-being of workers and support the development and maintenance of their working capacity, as well as professional and social development at work;
  iv.   enabling workers to conduct socially and economically productive lives and to contribute positively to sustainable development.

Students in the field would study basics of health sciences such as chemistry, biochemistry, biology, microbiology, human anatomy and physiology, psychology, epidemiology, biostatistics; as well as laws, ecology, pollution, occupational health, environmental health,

ergonomics, work place communication and health promotion, risk management, medical emergency response, safety and industrial hygiene, and occupational related diseases.

Graduates in this field should have the competency to work as occupational safety and health officers. Those with postgraduate qualifications would take the roles as safety and health manager, academicians, researchers, and consultants in this field.

Occupational Therapy

Occupational therapy is a client-centred health profession concerned with promoting health and well being through occupation. The primary goal of occupational therapy is to enable people to participate in the activities of everyday life. Occupational therapists achieve this outcome by working with people and communities to enhance their ability to engage in the occupations they want to, need to, or are expected to do, or by modifying the occupation or the environment to better support their occupational engagement. Occupational therapist able to analyse the physical, environmental, psychosocial, mental, spiritual, political and cultural factors to identify barriers that contribute to exclusion and occupational deprivation.

Occupational Therapy uses Occupational Therapy Framework to operationalize their expertise. Occupational Therapist deliver services to those who have or are at risk for developing an illness, injury, disease, disorder, impairment, disability, activity limitation or participation restriction, as well as trauma due to natural disaster.

The graduates are trained to be a registered practitioner in clinical and community setting, educator, consultant, researcher and administrator. Places of employment include schools, hospitals, skilled nursing facilities, homes, outpatient rehabilitation centres, psychiatric facilities, special schools, and long-term-care facilities.

Students are expected to be trained in the following competencies:
1. The person-occupation-environment relationship and its relationship to health
2. Therapeutic and professional relationship
3. An occupational therapy process
4. Professional reasoning and behaviour
5. The context of professional practice.

The particular knowledge, skills and attitudes in the above areas of competency will be determined by:

1. The nature of the local health needs including prevention of disability
2. The local health, welfare, disability and legislative systems
3. Locally relevant health giving occupation
4. Programme philosophy and purpose

Paramedical Sciences

The concept of Emergency Medicine and Trauma Services (EMTS) in Malaysia had existed since 1950's. While their functions and contribution to the overall healthcare system has been much appreciated globally, Emergency Medicine is relatively a new specialty rapidly expanding in Malaysia. One of the important component in Emergency Medicine is Pre Hospital Care (PHC) that has been developed, expanded and progressed over the recent years. Pre Hospital Care in Malaysia is very unique as the personnel involve in the field are from Ministry of Health Malaysia as main player supported by universities and other rescue agencies. Responder for Pre-Hospital Care will be in future called Paramedic.

First responder is a person who is certified to provide medical care in emergencies before more highly trained medical personnel arrive on the scene. Responder is a person that responds to an emergency situation or other calling. Practitioner is someone practicing a skilled profession for which special education or licensing is required.

Provider is a person or agency that supplies goods or services, particularly medical or paramedical services. Paramedic is certified healthcare personnel who is trained to provide emergency medical care out of hospital setting and transport the patient to hospital. They provide treatment ranges from basic life support to advance life support. The provision of emergency medical are regulated by local rules, policies, laws or standard practice.

The training will provide paramedic with abilities in critical thinking and problem solving skills based on current scientific evidences which are benchmarked against international standards. Paramedics are expected to work independently in a dynamic, challenging and hostile environment. Hence, training centre must be able to provide the competencies, knowledge and attributes required of paramedic to function effectively.

Emphasis on self-directed learning, e-learning, evidence based practice and problem solving skills will inculcate independent learners and critical thinkers to enable them to function in an

adaptive and challenging environments. In addition, training programme aimed to produce paramedic who are able to function as a team and have the acquisition in leadership and managerial skills to perform inter-professionally and collaboratively in providing quality service in Pre Hospital Care.

Physiotherapy

Physiotherapy is a healthcare profession providing services to individuals and population to develop, maintain and restore maximum movement and functional ability throughout the lifespan. It involves with maximizing the quality of life and movement potential through promotion, prevention and treatment in the field of rehabilitation.

There is a diversity of clinical specialties in physiotherapy to meet the unique needs of different client groups. Physiotherapists use physical interventions which include movement therapy, functional training, exercise prescription, electro-physical agents, manual therapy and assistive device prescription.

The practice of physiotherapy is client–centered incorporating assessment, interpretation and analysis of findings, planning intervention and evaluation of physical dysfunction, movement disorders and pain. Physiotherapists work independently or under direct or indirect supervision, working in isolation or within a multidisciplinary team. With the increasing demands of chronic disease particularly the ageing population, physiotherapists work as a part of the health care team to provide an integrated service. They are in primary first line health care in preventing and promoting health and wellbeing of the community.

Physiotherapy services are available in a wide variety of areas such as hospitals, health organizations, physiotherapy private practices, schools, community settings, sports, fitness clubs, health/ wellness centers, gymnasia and spas, hospices, nursing homes, occupational health centers, rehabilitation centers, education and research centers.

The physiotherapy education at undergraduate levels requires a structured programme with a mandatory supervised practice component in the clinical settings with the focus on the development of knowledge, skills and the professional attributes of a physiotherapist.

Postgraduate education offers physiotherapists the opportunity to extend their understanding of key areas and expand their professional capacity, including challenging the foundations of established treatment procedures with newly acquired scientific evidence, developing and

undertaking clinical research, learning about new and emerging treatment options and engaging in the mentorship of recognized experts in various physiotherapy specialties.

The programme standards for physiotherapy are intended to provide the internal and external stakeholders namely Higher Education Provider (HEP), Registration Board, employers, clinical educators, Malaysian Physiotherapy Association, physiotherapists and students with benchmark for the knowledge, skills and attributes of a competent and accountable physiotherapist.

Radiation Therapy

Radiation Therapy is an ionising radiation modality for the management of malignant diseases and other pathological conditions. The Radiation Therapist is responsible for the planning of safe and accurate delivery of ionising radiation therapeutic dose. The radiation therapist is also responsible for total care of the patient inclusive of physical and psychosocial wellbeing.

Radiation Therapy may be used alone or with other treatment modalities like surgery and chemotherapy. The ionising radiation used in the treatment of cancer may include X-rays, gamma rays, electrons beams and charged particles. The Radiation Therapist is a member of a multidisciplinary team who responsible for the design, planning and delivery of prescribed ionising radiation dose over a course of treatment to the patient.

The Radiation Therapist utilises sophisticated imaging equipment and current computer systems to create a treatment plan to deliver the optimum dose to the tumour, specific to a particular patient and the diagnosis, whilst minimising the dose delivered to healthy tissue. The Radiation Therapist needs to have professionalisme and strong interpersonal skills. The Radiation Therapist's role extends to counselling of patients regarding their diagnosis and treatment.

Radiation therapists with postgraduate qualifications (Master and Doctoral degree) will have a wider scope of responsibilities which include the determination of appropriate ionising radiation dosage, interpretation of investigation, and conducting follow up review of the patient. They are also responsible for the total patient care which include physical and psychological wellbeing.

Speech Sciences

Speech sciences is the study of human communication sciences and disorders that includes normal and disordered aspects of communication and swallowing. Areas of communication studied are language; speech i.e., voice, speech sound and fluency; and hearing. It focuses on the assessment and intervention of communication and swallowing disorders.

The curriculum provides a strong foundation in the main areas of speech sciences during the four years of study. The curriculum is designed to cover all fundamental and clinical aspects of speech sciences – sufficient for a graduate to function and perform re/habilitation services in communication disorders and swallowing problem. The courses will include a balance of both theoretical and practical components. The theoretical components comprise knowledge in interdisciplinary fields such as speech and language pathology, linguistics, psychology, medical and health sciences, education, acoustics, and research methodology. The practical components of the curriculum will provide opportunity for students to translate theory to practice and to develop their clinical skills by working with a variety of patients in a range of work settings under the supervision of qualified clinical supervisors.

Graduates are qualified to practice as Speech Language Therapists (SLTs) who manage children and adults with communication and swallowing disorders.

PROGRAMME AIMS AND EDUCATIONAL OBJECTIVES

Programme aims are guided by the vision, mission and goals of the HEP in its academic planning and implementation to strive towards excellence. "A programme's stated aims reflect what it wants the learner to achieve. It is crucial for these aims to be expressed explicitly and be made known to learners and other stakeholders alike" (COPPA, 2008, pp. 10).

Programme aims are described in a broad and general statement of learning and teaching intention, encapsulating the general contents and direction of a programme.

The aims of higher education are to produce competent graduates through the:

- provision of knowledge and practical skills based on scientific principles;
- inculcation of professional attitude, leadership quality and social responsibility;
- development of the ability to analyse, problems solving, and decisions making;
- development of the quest for knowledge and the lifelong learning skills; and
- inculcation of the awareness to the current and relevant issues related to national and international context.

"The quality of the HEP and the programme that it offers is ultimately assessed by the ability of its graduates to carry out their expected roles and responsibilities in society. This requires a clear statement of the competencies, i.e., the practical, intellectual and soft skills that are expected to be achieved by the student at the end of programme. The main domains of learning outcomes cover knowledge, practical and social skills, critical and analytical thinking, values, ethics and professionalism. The levels of competency of these learning outcomes are defined in the Malaysian Qualifications Framework (MQF)," *(COPPA, 2008,* pp. 10).

The following programmes aims are given for each level of qualification from diploma to doctoral level:

DIPLOMA (Malaysian Qualifications Framework, MQF Level 4)

The programme aims to provide graduates with the relevant skills and a broad-based knowledge. It is a mid-level qualification comprising of theory and practical components which enable them to function effectively and competently. It comprises vocational and technical components to take on appropriate jobs.

BACHELOR'S DEGREE (Malaysian Qualifications Framework, MQF Level 6)

The programme aims to provide graduates with indepth knowledge and skills. It is a higher degree qualification comprising of theory and practical components which enable them to take responsibility, make professional decision, adapt and contribute to management. It prepares graduate for entry into postgraduate studies and research.

MASTER'S DEGREE (Malaysian Qualifications Framework, MQF Level 7)

The programme aims to provide graduates with the advanced knowledge and skills in specialised areas to deal with the demands of the new developments in the field of medical and health sciences. It is an advanced level qualification comprising of theory and practical components which enable them to carry out research and function effectively at managerial level.

DOCTORAL DEGREE (Malaysian Qualifications Framework, MQF Level 8)

The programme aims to provide graduates the ability to carry out scholarly research and become experts in their fields. The programme encompasses the advancement of knowledge and the conduct of independent research in their respective field which enable them to function effectively and independently at higher level management.

LEARNING OUTCOMES

Learning outcomes are statements described in explicit terms of learners' achievement upon completion of a period of study. These learning outcomes should cumulatively reflect the eight domains of learning outcomes (MQF, 2007, Para 15, pp. 4) and are related to the various levels of taxonomy accordingly, in line with national and global developments.

The eight domains of learning outcomes are:
  i. knowledge;
  ii. practical skills;
  iii. social skills and responsibilities;
  iv. values, attitudes and professionalism;
  v. communication, leadership and team skills;
  vi. problem solving and scientific skills;
  vii. information management and lifelong learning skills; and
  viii. managerial and entrepreneurial skills.

The following are the benchmark learning outcomes of the individual programme according to the field of study:

DIPLOMA

MEDICAL LABORATORY TECHNOLOGY
Upon completion of the programme, graduates should be able to:
  1. demonstrate fundamental knowledge in medical sciences;
  2. perform medical laboratory procedures, validate and refer findings competently;
  3. assist in advanced medical laboratory procedures;
  4. perform quality control procedures competently;
  5. identify technical errors, perform basic troubleshooting and related problem-solving procedures;
  6. assist in the management of the laboratory;
  7. practise according to bio-safety and chemical safety requirements and regulations;
  8. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;
  9. adhere to the legal, ethical principles and the professional code of conduct in medical laboratory sciences;

10. communicate effectively in verbal and written forms with patients, their family /caregiver, peers, healthcare professionals and the stakeholders at large;

11. demonstrate leadership, interpersonal and social skills;

12. collaborate with other healthcare professionals;

13. formulate solutions based on critical and lateral thinking;

14. participate in research related to medical laboratory sciences and health sciences; and

15. demonstrate ICT, entrepreneurial and lifelong learning skills in their practice.

ENVIRONMENTAL HEALTH

Upon completion of the programme, graduates should be able to:

1. apply the technical and scientific knowledge of environmental and occupational health principles;

2. utilise and present information and findings coherently;

3. perform task and manage the operational unit in the environmental health field;

4. contribute to solving emerging and re-emerging environmental health issues;

5. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;

6. adhere to the legal and ethical principles, and the professional code of conduct in environmental health;

7. communicate effectively in verbal and written forms with peers, healthcare professionals, stakeholders and the community at large;

8. demonstrate leadership, interpersonal and social skills;

9. collaborate with other healthcare and other professionals;

10. demonstrate problem solving and reasoning skills;

11. participate in research related to environmental health and interdisciplinary areas; and

12. utilise information and communication technology (ICT), entrepreneurial and lifelong learning skills in their practice.

HEALTH CARE MANAGEMENT

Upon completion of the programme, graduates should be able to:

1. acquire the fundamental knowledge of healthcare management in relevant to health care system and delivery services;

2. demonstrate and apply knowledge and skills in coordinating daily activities in relevant to healthcare delivery services and management;

3. demonstrate responsibilities towards the community, culture and environment;

4. communicate effectively with patients, family/caregiver, peers, healthcare professionals, stakeholders and the community at large;

5. assist effectively as an individual and in a group with leadership and managerial capabilities;

6. utilise information communication and technology (ICT) to document findings and data appropriately;

7. use principles of lifelong learning in academic expansion; and

8. demonstrate management and entrepreneurial skills relevant to health care management in career development.

MEDICAL IMAGING

Upon completion of the programme, graduates should be able to:

1. demonstrate fundamental knowledge in imaging;

2. perform radiographic procedures competently;

3. demonstrate critical thinking and decision making related to medical imaging;

4. communicate effectively both in written and verbal at the professional and community level;

5. demonstrate social, global and environmental responsibilities in order to practice inter professional collaboration in healthcare industry;

6. adhere to the legal, ethical principles and the professional code of conduct in medical imaging;

7. engage in life-long learning; and

8. apply basic managerial and entrepreneurial skills

OCCUPATIONAL SAFETY & HEALTH

Upon completion of the programme, graduates should be able to:

1. describe, interpret and apply the knowledge and skills in occupational safety and health;

2. identify and perform various roles and responsibilities of occupational safety and health professionals in measuring safety and health of workplaces;

3. assess potential occupational safety and health problems at workplaces and the community;

4. apply knowledge and skills to ensure occupational safety and health in workplaces and the community;

5. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;

6. adhere to the legal, ethical principles and the professional code of conduct in occupational safety and health;

7. communicate in verbal and written forms with workers, other safety and health professionals, stakeholders and the community at large;

8. demonstrate leadership, interpersonal and social skills;

9. collaborate with other skills professionals;

10. coordinate daily activities of occupational safety and health;

11. demonstrate basic problem solving skills; and

12. demonstrate ICT, entrepreneurial and lifelong learning skills in their practice

OCCUPATIONAL THERAPY

Upon completion of the programme, graduates should be able to:

1. use foundational knowledge in occupational therapy;

2. use occupational therapy process to enabling occupation based on client's needs, behaviour, religion and culture;

3. perform occupational therapy assessment and intervention technique and procedure;

4. demonstrate awareness of social responsibility and the need for sustainable development in occupational therapy profession in tandem with MOH service needs;

5. demonstrate values, ethics and professionalism behaviour through role and responsibilities as described by the Allied Health Division;

6. use effective communication and collaborative approaches for safe, ethical and effective practice in meeting client's need, colleagues and public;

7. demonstrate supervisory ability, interpersonal, and social skills;

8. practice problems solving principles and evidence-based practice in decision making for safe, ethical and effective patient/client management in consultation with expert;

9. participate in research related activities in Occupational Therapy, utilising ICT and effective information management;

10. demonstrate commitment to continuing competence and career development through lifelong learning; and

11. participate in quality management and entrepreneurial skills in workplace and everyday activities.

PARAMEDICAL SCIENCE

Upon completion of the programme, graduates should be able to:

1. demonstrate medical knowledge and clinical skills in providing paramedical care to the clients competently;

2. demonstrate to utilize strategic, critical thinking and problem solving skills in a professional manner to optimize patient care;

3. demonstrate to practice professionally within the ethical and legal boundaries of the healthcare profession;

4. demonstrate effective communication skills to clients, peers, healthcare professionals and the stakeholders at large;

5. demonstrate leadership, interpersonal and social skills;

6. work effectively with others as a team member in providing effective patient care;

7. demonstrate ICT, entrepreneurial and lifelong learning skills in their practice; and

8. demonstrate to gather information for the contribution to the new knowledge through research and development in health care practice

PHYSIOTHERAPY

Upon completion of the programme, graduates should be able to:

1. acquire fundamental knowledge in physiotherapy;

2. perform assessment and treatment skills safely and effectively for various physiotherapy related conditions;

3. demonstrate sensitivities, responsibility and accountability towards the community of diverse cultural and religious differences;

4. demonstrate professionalism by complying with the legal, ethical principles and professional code of conduct in physiotherapy;

5. demonstrate effective communication, good team working and leadership skills;

6. demonstrate problem solving skill and ability in clinical reasoning using scientific skills;

7. engage in lifelong learning and information management system to enhance the physiotherapy practice in health and wellness; and

8. develop basic administrative, managerial skills and entrepreneurship relevant to health and wellness.

RADIATION THERAPY

Upon completion of the programme, graduates should be able to:

1. demonstrate fundamental knowledge in radiation therapy;
2. perform radiation therapy procedures competently;
3. perform basic quality assurance procedures;
4. adhere to radiation safety practices;
5. provide quality management of patient/client-centred care;
6. assist in the management of the radiotherapy department;
7. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;
8. adhere to the legal, ethical principles and the professional code of conduct in radiation therapy;
9. communicate effectively in verbal and written forms with patients, their family/caregiver, peers, healthcare professionals and the stakeholders;
10. demonstrate leadership, interpersonal and social skills;
11. collaborate with other healthcare professionals;
12. demonstrate problem solving and clinical reasoning skills;
13. participate in research related to radiation therapy; and
14. demonstrate ICT, entrepreneurial and lifelong learning skills in their practice.

BACHELOR DEGREE

BIOMEDICAL SCIENCE / MEDICAL LABORATORY TECHNOLOGY

Upon completion of the programme, graduates should be able to:

1. apply fundamental and advanced knowledge in medical and health sciences;
2. perform and supervise medical laboratory procedures competently and validate findings;
3. present information and findings coherently;
4. plan, manage and execute quality management system and Good Laboratory Practices (GLP);
5. evaluate and implement new medical laboratory methodologies and instrumentations;
6. demonstrate the ability to seek, adapt and provide solutions to address challenges in medical laboratory practices;
7. coordinate daily activities of medical laboratory practice;
8. adhere to biological, chemical and radiation safety requirements and regulations;
9. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;
10. adhere to the legal, ethical principles and the professional code of conduct in medical laboratory;
11. communicate effectively in verbal and written forms with patients, their family /caregiver, peers, healthcare professionals and the stakeholders at large;
12. demonstrate leadership, interpersonal and social skills;
13. collaborate with other healthcare professionals;
14. utilise relevant techniques and identify problems and solutions based on critical and lateral thinking;
15. conduct research related to medical laboratory under supervision;
16. utilise ICT and information management system to enhance their medical laboratory practices;
17. apply skills and principles of lifelong learning in academic and career development; and
18. apply broad business and real world perspectives in workplace and everyday activities and demonstrate entrepreneurial skills.

DIETETICS

Upon completion of the programme, graduates should be able to:

1. describe, interpret and apply knowledge of food, nutrition, clinical and social sciences in nutrition care process;

2. perform and evaluate the theories and methodologies of nutritional status assessment for individual and community;

3. counsel patients in a caring, empathic and culturally-sensitive manner;

4. educate the health professionals and the community on healthy diet and lifestyle;

5. apply principles of evidence-based practices;

6. manage menu planning, procurement and food service activities in hospitals or health care facilities;

7. coordinate daily activities of dietetics practice;

8. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;

9. adhere to the legal, ethical principles and the professional code of conduct in dietetics;

10. implement sanitation and safety procedures in food service management systems;

11. communicate effectively in verbal and written forms with patients, their family /caregiver, peers, healthcare professionals and the stakeholders at large;

12. demonstrate leadership, interpersonal and social skills;

13. collaborate with other healthcare professionals;

14. utilise relevant techniques and identify problems and solutions based on critical and lateral thinking;

15. conduct research related to dietetics under supervision;

16. present information and findings coherently;

17. utilise ICT and information management system to enhance their dietetics practice;

18. apply skills and principles of lifelong learning in academic and career development; and

19. apply broad business and real world perspectives in workplace and everyday activities and demonstrate entrepreneurial skills.

ENVIRONMENTAL HEALTH

Upon completion of the programme, graduates should be able to:

1. apply knowledge and skills to assess and monitor the environment, workplace and human health;

2. evaluate, prevent, control and manage environmental and occupational health problems;

3. plan, implement and evaluate environmental and occupational health programme and strategies;

4. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;

5. adhere to the legal and ethical principles and the professional code of conduct in environmental health;

6. communicate effectively in verbal and written forms with peers, healthcare professionals, stakeholders and advocacy of the community at large;

7. demonstrate professional, managerial, interpersonal and social skills;

8. demonstrate leadership and collaborating skills with healthcare and other professionals;

9. identify, analyse and interpret critically environmental health data and problems to provide solutions based on evidence;

10. conduct research related to environmental and occupational health under supervision;

11. apply information and communication technology (ICT) and information management system to enhance their environmental and occupational health practices;

12. apply skills and principles of lifelong learning in academic and career development; and

13. apply broad business and real world perspectives in workplace and everyday activities and demonstrate entrepreneurial skills.

HEALTH CARE MANAGEMENT

Upon completion of the programme, graduates should be able to:

1. describe and apply fundamental knowledge and skills of healthcare management in relevant to health care system and delivery services;

2. practice quality assurance and improvement skills in coordinating daily tasks in relevant to healthcare delivery services and management;

3. demonstrate sensitivities and responsibilities towards the community, culture and environment;

4. adhere to the legal, ethical principles and the professional code of conduct in health care;

5. communicate effectively with patients, family /caregiver, peers, healthcare professionals, stakeholders and the community at large;

6. demonstrate leadership, interpersonal, social skills and collaboration abilities with other healthcare professionals;

7. utilise information communication and technologies (ICTs) to present information and findings coherently to enhance health care management practices;

8. apply skills and principles of lifelong learning in academic and career development; and

9. demonstrate effective management and entrepreneurial skills in relevant to the healthcare management and delivery services.

MEDICAL IMAGING

Upon completion of the programme, graduates should be able to:

1. apply fundamental knowledge in the field of medical imaging;

2. demonstrate competencies in the medical imaging;

3. demonstrate critical thinking and decision making related to medical imaging and research;

4. communicate effectively both in written and verbal at the professional and community level;

5. demonstrate social, global and environmental responsibilities in order to practice inter-professional collaboration in healthcare industry;

6. perform responsibility/duties professionally, ethically and with humanity, in accordance with the medical imaging field and the healthcare industry;

7. identify the need to engage in life-long learning and management of information in the medical imaging and the healthcare industry;

8. self motivated, with entrepreneurship and managerial capabilities for career development; and

9. demonstrate effective leadership responsibility as an individual, and in a group.

NUTRITION

Upon completion of the programme, graduates should be able to:

1. describe, interpret and apply knowledge of food, nutrition and health sciences
2. identify markers of nutritional status in planning, modifying, implementing and evaluating nutritional surveillance at group, community and/or population levels
3. utilise relevant techniques and identify nutrition problems and solutions based on critical and lateral thinking at individual, group, community and/or population levels as well as educate health professionals and community on nutrition and healthy lifestyle.
4. plan, implement and evaluate nutrition promotion and intervention activities at individual and community levels.
5. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment based on professionalism, value, attitude and ethics.
6. demonstrate leadership skills and communicate effectively with peers, healthcare professionals, community and the stakeholders at large
7. utilise ICT and information management system to enhance their nutrition practices and services
8. apply skills and principles of lifelong learning in academic and career development and expansion
9. demonstrate management and entrepreneurial skills in career development.

OCCUPATIONAL THERAPY

Upon completion of the programme, graduates should be able to:

1. critically use foundational and advanced knowledge in occupational therapy;
2. critically use Occupational Therapy process to enabling occupation based on client's needs, behaviour, religion and culture;
3. perform effective use of Occupational Therapy assessment and intervention technique and procedure;
4. demonstrate awareness of social responsibility and the need for sustainable development in occupational therapy profession in tandem with MOH service needs;
5. demonstrate values, ethics and professionalism behavior through role and responsibilities as described by the Allied Health Division;
6. use effective communication and collaborative approaches for safe, ethical and effective practice in meeting client's need, colleagues and public;
7. demonstrate managerial attributes, interpersonal, and social skills;
8. adhere to problems solving principles and evidence-based practice in decision making for safe, ethical and effective patient/client management;

9. demonstrate ability in conducting research in occupational therapy, utilising ICT and information management;

10. demonstrate commitment to continuing competence and career development; and

11. participate and lead quality management and entrepreneurial skills in workplace and everyday activities.

OCCUPATIONAL SAFETY AND HEALTH

Upon completion of the programme, graduates should be able to:

1. describe, interpret and apply knowledge and skills in occupational safety and health;

2. assess and analyse issues of occupational safety and health in workplaces and the community;

3. interpret, analyse, synthesise and recommend preventive and corrective measures in occupational safety and health;

4. educate and train employees, employers and the community on occupational safety and health;

5. apply evidence-based scientific principles in discussing ideas of improvement in occupational safety and health;

6. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;

7. adhere to the legal, ethical principles and the professional code of conduct in occupational safety and health;

8. communicate in verbal and written forms with workers, other safety and health professionals, stakeholders and the community at large;

9. demonstrate leadership, interpersonal and social skills;

10. collaborate with other skills professionals;

11. identify and analyse critically occupational safety and health problems to provide solutions based on evidence;

12. conduct research related to occupational safety and health under supervision;

13. utilise ICT and information management system to enhance their occupational safety and health practices;

14. apply skills and principles of lifelong learning in career development; and

15. apply broad business and real world perspectives in workplace and demonstrate entrepreneurial skills.

PARAMEDICAL SCIENCE

Upon completion of the programme, graduates should be able to:

1. demonstrate fundamental knowledge in paramedical sciences and has the competence to increase/expand knowledge;

2. demonstrate the understanding and the competency in selecting and performing the assessment and treatment techniques;

3. demonstrate the sense of responsibility and accountability with social skills in dealing with the clients;

4. develop the professional attitude of a paramedic adhering to legal and ethical principles;

5. demonstrate the ability in team working characterised by leadership and good communication skills;

6. possess intellectual skills and is competent in reasoning, reflecting and forming a judgement in clinical decision using scientific evidences;

7. demonstrate lifelong learning skill through systemic approach and information management for career development; and

8. demonstrate effective managerial and entrepreneurial skills in the planning, organisation of a facility and/or practice.

PHYSIOTHERAPY

Upon completion of the programme, graduates should be able to:

1. apply fundamental knowledge in physiotherapy and has the competence to increase and expand knowledge;

2. develop the competency in selecting and performing the assessment and treatment techniques;

3. demonstrate the sense of responsibility and accountability with social skills in dealing with the clients;

4. develop the professional attitude of a physiotherapist adhering to legal and ethical principles;

5. demonstrate the ability in team working characterized by leadership and good communication skills;

6. possess intellectual skills and is competent in reasoning, reflecting and forming a judgement in clinical decision using scientific evidences;

7. conduct research related to physiotherapy under supervision and demonstrate lifelong learning skill through systemic approach and information management for career development; and

8. demonstrate effective managerial and entrepreneurial skills in the planning and organization of a facility and /or practice.

RADIATION THERAPY

Upon completion of the programme, graduates should be able to:

1. demonstrate comprehensive knowledge in radiation therapy;
2. perform radiation therapy procedures competently;
3. perform patient assessment throughout the course of radiation therapy and provide adequate care;
4. evaluate procedures and institute corrective actions, including implementation of quality assurance programme;
5. demonstrate the ability to seek, adapt and provide solutions to address challenges in radiation therapy practices;
6. coordinate daily activities of radiation therapy practices;
7. demonstrate sensitivities and responsibilities towards the community, culture, religion and environment;
8. comply to the legal, ethical principles and the professional code of conduct in radiation therapy;
9. adhere to radiation safety requirements and regulations;
10. communicate effectively in verbal and written forms with patients, their family / caregiver, peers, healthcare professionals and the stakeholders at large;
11. demonstrate leadership, interpersonal and social skills;
12. collaborate with other healthcare professionals;
13. utilise relevant techniques and identify problems and solutions based on critical and lateral thinking;
14. conduct research related to radiation therapy under supervision;
15. present information and findings coherently;
16. utilise ICT and information management system to enhance their radiation therapy practice;
17. apply skills and principles of lifelong learning in academic and career development; and
18. apply broad business and real world perspectives in workplace and everyday activities and demonstrate entrepreneurial skills.

SPEECH SCIENCES

Upon completion of the programme, graduates should be able to:

1. demonstrate adequate knowledge of speech, language, hearing and swallowing disorders including principles and methods of the assessment, intervention and prevention; as well as the human biological sciences; linguistics; human psychology; research methodology and analysis;

2. provide assessment and intervention to individuals with speech, language, hearing and swallowing disorders;

3. demonstrate sensitivities to diversity (e.g. language, culture, religion, disability, gender, etc.) and responsibilities towards the community;

4. adhere to the professional code of conduct and ethics of speech-language therapy profession;

5. demonstrate leadership, positive interpersonal and communication skills, and synergy in multidisciplinary team;

6. apply critical thinking in reasoning and solving problems in speech-language therapy scope of practice;

7. engage in continuous professional development and research activities, and utilize ICT for the management of information in speech-language therapy service provision; and

8. apply basic managerial and entrepreneurial skills for speech-language therapy service provision.

MASTER'S DEGREE

Master's Degree (Adapted from Standards: Masters and Doctoral)

Upon completion of the programme, graduates should be able to:

1. demonstrate mastery of knowledge in the relevant field;
2. apply practical skills in the relevant field;
3. relate ideas to societal issues in the relevant field;
4. conduct research with minimal supervision and adhere to legal, ethical and professional codes of practice;
5. demonstrate leadership qualities through communicating and working effectively with peers and stakeholders;
6. generate solutions to problems using scientific and critical thinking skills; and
7. manage information for lifelong learning

PHYSIOTHERAPY

Upon completion of the programme, master graduates should be able to:

1. demonstrate mastery of knowledge in physiotherapy
2. apply and adapt physiotherapy skills leading to innovative idea in the relevant specialties
3. relate ideas to societal issues and needs in the chosen field with sense of responsibilities and accountabilities
4. develop the professional attitude of a physiotherapist adhering to legal and ethical principles
5. demonstrate leadership qualities with effective communication and working effectively with peers and stakeholders linking to international organizations
6. conduct research independently and generate solutions to problems using scientific and critical thinking skills
7. manage information for lifelong learning for the advancement of clinical practice, education and research in physiotherapy
8. demonstrate effective managerial and entrepreneurial skills to evaluate and implement best practices

DOCTORAL DEGREE

Doctoral Degree (Adapted from Standards: Masters and Doctoral)

Upon completion of the programme, graduates should be able to:

1. synthesise knowledge and contribute to original research that broadens the frontier of knowledge in the relevant field;
2. adapt practical skills leading to innovative ideas in the relevant field;
3. provide expert advice to society in the relevant field;
4. conduct research independently and adhere to legal, ethical and professional codes of practice;
5. display leadership qualities through communicating and working effectively with peers and stakeholders;
6. appraise problems in the relevant field critically using scientific skills; and
7. integrate information for lifelong learning.

PHYSIOTHERAPY

Upon completion of the programme, graduates should be able to:

1. synthesize knowledge and contribute to original research that broadens the frontier of knowledge in the relevant specialties;
2. apply and adapt practical skills leading to innovative ideas in the relevant specialties
3. provide expert advice to society in the relevant specialties
4. conduct research independently and adhere to legal, ethical and professional codes of practice;
5. display leadership qualities through communicating and working effectively with peers and stakeholders
6. appraise problems in the relevant specialty critically using scientific skills
7. integrate information for lifelong learning for the advancement of clinical practice, education and research in physiotherapy

8. display managerial and entrepreneur skills to formulate, evaluate and implement policies, regulations and guidelines for best practices

CURRICULUM DESIGN AND DELIVERY

This section of the Programme Standards contains benchmark statements pertaining to the structure and delivery of a programme within the field of medical and health sciences.

The curriculum structure is divided into 3 main components which are Compulsory Modules (General and HEP modules), Core Module (fundamental, professional and industrial training/clinical pla) and Optional Module. The proposed body of knowledge in the various level of the discipline is stated in **Appendix 2.** The recommended modes of delivery are included.

The proposed structures are only guidelines, HEPs are encouraged to develop the programme to reflect current best practices, achieve higher standards and develop specialisations.

Industrial training/ clinical placement / field work is crucial in the development of students' maturity and experience. Hence, HEPs need to allocate the number of credits based on the formula of 1 credit = 40 hours of training.

Reference for COPPA
"For the purposes of this code of practice for accreditation of programmes offered by higher education providers, the term 'curriculum design and delivery' is used interchangeably with the term 'programme design and delivery'. "Programme" means an arrangement of courses that are structured for a specified duration and learning volume to achieve the stated learning outcomes and usually leading to an award of a qualification," *(COPPA, 2008,* pp. 12).

<u>DIPLOMA</u>
- Minimum Graduating Credits are given in the respective tables below and it ranges between 90 and 105 with minimum 3 years programme.
- Upon completion of the programme, graduates are recommended to spend minimum of 1000 hours (25 credits) for industrial / clinical placement, subject to the requirement of their subfields.

CURRICULUM STRUCTURE

1) MEDICAL LABORATORY TECHNOLOGY

<table>
<tr><th colspan="4">Minimum Graduating Credit- 90</th></tr>
<tr><th colspan="2">Component</th><th>Credit</th><th>Percentage</th></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td>9 – 14</td><td>10 – 15</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td>18 – 23</td><td>20 – 25</td></tr>
<tr><td>2. Professional Modules</td><td>41 – 48</td><td>45 – 53</td></tr>
<tr><td>3. Industrial Training**</td><td>12 - 15</td><td>13 – 16</td></tr>
<tr><td colspan="2">Optional Modules</td><td>4 – 8</td><td>4 – 9</td></tr>
</table>

2) ENVIRONMENTAL HEALTH

<table>
<tr><th colspan="4">Minimum Graduating Credit - 90</th></tr>
<tr><th colspan="2">Component</th><th>Credits</th><th>Percentage</th></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td>9 – 11</td><td>10 – 12</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td>13 – 20</td><td>15 –23</td></tr>
<tr><td>2. Professional Modules</td><td>31 – 37</td><td>35 –42</td></tr>
<tr><td>3. Industrial Training**</td><td>25 – 28</td><td>28 –32</td></tr>
<tr><td colspan="2">Optional Modules</td><td>3 – 4</td><td>4 – 5</td></tr>
</table>

3) HEALTH CARE MANAGEMENT

<table>
<tr><td colspan="4">Minimum Graduating Credit – 90</td></tr>
<tr><td colspan="2">Component</td><td>Credits</td><td>Percentage</td></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td>9 – 14</td><td>10– 15</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td>14 – 25</td><td>15 – 28</td></tr>
<tr><td>2. Professional Modules</td><td>36 – 45</td><td>40 – 50</td></tr>
<tr><td>3. Industrial Training**</td><td>6 – 11</td><td>7 – 12</td></tr>
<tr><td colspan="2">Optional Modules</td><td>9 – 12</td><td>10 – 13</td></tr>
</table>

4) MEDICAL IMAGING

<table>
<tr><td colspan="4">Minimum Graduating Credit - 100</td></tr>
<tr><td colspan="2">Component</td><td>Credit</td><td>Percentage</td></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td>9 – 21</td><td>9 – 20</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td>8 – 20</td><td>8 – 20</td></tr>
<tr><td>2. Professional Modules</td><td>35 – 40</td><td>35 – 40</td></tr>
<tr><td>3. Industrial Training**</td><td>30 – 35</td><td>30 – 35</td></tr>
<tr><td colspan="2">Optional Modules</td><td>5 – 10</td><td>5 – 10</td></tr>
</table>

5) **OCCUPATIONAL SAFETY AND HEALTH**

<table>
<tr><td colspan="4" align="center">Minimum Graduating Credit - 90</td></tr>
<tr><td colspan="2">Component</td><td align="center">Credits</td><td align="center">Percentage</td></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td align="center">9 – 14</td><td align="center">10 – 15</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td align="center">14 – 25</td><td align="center">15 – 28</td></tr>
<tr><td>2. Professional Modules</td><td align="center">36 – 45</td><td align="center">40 – 50</td></tr>
<tr><td>3. Industrial Training**</td><td align="center">25 – 28</td><td align="center">28 – 31</td></tr>
<tr><td colspan="2">Optional Modules</td><td align="center">9 – 12</td><td align="center">10 – 13</td></tr>
</table>

6) **OCCUPATIONAL THERAPY**

<table>
<tr><td colspan="4" align="center">Minimum Graduating Credit - 105</td></tr>
<tr><td colspan="2">Component</td><td align="center">Credits</td><td align="center">Percentage</td></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td align="center">9 – 13</td><td align="center">8 –13</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td align="center">17 – 21</td><td align="center">17 – 20</td></tr>
<tr><td>2. Professional Modules</td><td align="center">38 – 44</td><td align="center">37 – 42</td></tr>
<tr><td>3. Industrial Training**</td><td align="center">28 – 35</td><td align="center">27 – 33</td></tr>
<tr><td colspan="2">Optional Modules</td><td align="center">3 – 9</td><td align="center">3 – 9</td></tr>
</table>

:

7) PARAMEDICAL SCIENCE

Minimum Graduating Credit – 102			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		9 – 13	9 - 15
Core Modules	*1. Fundamental Modules include Basic Sciences and clinical sciences*	9 – 13	10 – 15
	2. Professional Modules	27 – 40	30 – 45
	*3. Industrial Training**	34 – 45	45 – 50
Optional Modules		0 – 4	0 – 5

8) PHYSIOTHERAPY

Minimum Graduating Credit - 105			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)**		10 – 15	10 – 14
Core Modules	*1. Fundamental Modules include Basic Sciences*	20 – 25	19 – 24
	2. Professional Modules	38 – 42	36 – 40
	*3. Industrial Training**	25 – 30	24 – 29
Optional Modules		2 – 3	2 – 3

9) **RADIATION THERAPY**

Minimum Graduating Credit - 96			
	Component	**Credit**	**Percentage**
	Compulsory Modules (General and HEP modules)*	9 - 14	9 – 14
Core Modules	1. *Fundamental Modules include Basic Sciences*	11-14	11 – 15
	2. *Professional Modules*	37 - 40	34 – 39
	3. *Industrial Training**	40 - 44	38 – 41
	Optional Modules	0 - 4	0 – 3

Note:

* *9-11 credits as prescribed by the Malaysian Ministry of Education (MOE) (Refer to Buku Panduan Mata Pelajaran Pengajian Umum Institut Pengajian Tinggi, MPU).*

**Includes Clinical or Professional Placement or Supervised Professional Placement*

Recommended delivery methods:

i. Lectures

ii. Tutorials

iii. Case study

iv. Problem-based learning

v. Self-directed learning

vi. Blended learning

vii. Field visits (e.g. business organisations, universities, non-governmental organisations, government-related corporations etc.)

viii. Industrial experience training (accredited centres e.g. business organisations, universities, non-governmental organisations, government-related corporations etc.)

Training Instrument

i) Syllabus-Theory and Clinical

ii) Procedural Booklet (for classroom teaching-learning)

iii) Clinical Learning Package

a. Guideline of Clinical Practice

b. Clinical Record Practice (To record clinical learning experience)

- Logbook   (Checklist of task)

- Competency Booklet   (Core Skill Practice)

- Assignment/Reflective Diary   (Learning/Thinking Process)

BACHELOR DEGREE

- Minimum Graduating Credits are given in the respective tables below and it ranges between 120 and 145 credits.
- Upon completion of the programme, graduates are recommended to spend minimum of 1000 hours (25 credits) for industrial / clinical placement, subject to the requirement of their subfields.

CURRICULUM STRUCTURE

1) BIOMEDICAL SCIENCE

Minimum Graduating Credit - 136			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		12 – 20	8 – 15
Core Modules	1. Fundamental Modules include Basic Sciences	20 – 34	10 – 16
	2. Professional Modules	68 – 79	50 – 56
	3. Industrial Training**	9 – 25	13 – 22
Optional Modules		5 – 10	5 – 8

2) MEDICAL LABORATORY TECHNOLOGY

Minimum Graduating Credit - 136			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		12 – 20	8 – 15
Core Modules	1. Fundamental Modules include Basic Sciences	14 – 34	10 – 25
	2. Professional Modules	68 – 79	50 – 58
	3. Industrial Training**	5 – 11	4 – 8
Optional Modules		14 – 18	10 – 13

3) DIETETICS

<table>
<tr><th colspan="4">Minimum Graduating Credit - 136</th></tr>
<tr><th colspan="2">Component</th><th>Credits</th><th>Percentage</th></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td>12 – 14</td><td>8 – 10</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td>16 – 25</td><td>12 –18</td></tr>
<tr><td>2. Professional Modules</td><td>65 – 70</td><td>48 –51</td></tr>
<tr><td>3. Industrial Training**</td><td>28 – 30</td><td>21 –22</td></tr>
<tr><td colspan="2">Optional Modules</td><td>6 – 8</td><td>5 – 6</td></tr>
</table>

4) ENVIRONMENTAL HEALTH

<table>
<tr><th colspan="4">Minimum Graduating Credit - 129</th></tr>
<tr><th colspan="2">Component</th><th>Credits</th><th>Percentage</th></tr>
<tr><td colspan="2">Compulsory Modules (General and HEP modules)*</td><td>12 – 15</td><td>9 – 12</td></tr>
<tr><td rowspan="3">Core Modules</td><td>1. Fundamental Modules include Basic Sciences</td><td>19 – 34</td><td>15 – 26</td></tr>
<tr><td>2. Professional Modules</td><td>52 – 62</td><td>40 – 48</td></tr>
<tr><td>3. Industrial Training**</td><td>25 – 28</td><td>20 – 22</td></tr>
<tr><td colspan="2">Optional Modules</td><td>5 – 8</td><td>4 – 7</td></tr>
</table>

ENVIRONMENTAL, OCCUPATIONAL SAFETY AND HEALTH

Below are the recommended structure for combination of Environmental Health and Occupational Safety and Health:

Minimum Graduating Credit - 129			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		12 – 19	9 – 15
Core Modules	1. *Fundamental Modules include Basic Sciences*	17 – 35	13 – 27
	2. *Professional Modules*	52 – 62	40 – 48
	3. *Industrial Training**	25 – 28	19 – 22
Optional Modules		4 – 6	3 – 5

5) HEALTHCARE MANAGEMENT

Minimum Graduating Credit - 129			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		12– 19	9– 15
Core Modules	1. *Fundamental Modules include Basic Sciences*	19 – 37	15 – 29
	2. *Professional Modules*	52 – 62	40 – 48
	3. *Industrial Training**	9 – 15	7 – 12
Optional Modules		9– 12	7– 9

6) MEDICAL IMAGING

Minimum Graduating Credit - 136		
Component	**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*	12 – 22	8 – 16
Core Modules — *1. Fundamental Modules include Basic Sciences*	16 – 26	12 – 26
Core Modules — *2. Professional Modules*	54 – 68	40 – 50
Core Modules — *3. Industrial Training** *	25 – 35	19 – 26
Optional Modules	5 – 18	4 – 13

7) NUTRITION

Minimum Graduating Credit - 136		
Component	**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*	12 – 20	8 – 15
Core Modules — *1. Fundamental Modules include Basic Sciences*	14 – 31	10 – 23
Core Modules — *2. Professional Modules*	68 - 79	50 – 58
Core Modules — *3. Industrial Training** *	14 – 18	10 – 13
Optional Modules	14 – 18	10 – 13

Note: The minimum number of credit hours required for the "must have" courses is two-thirds (67%) of the total credit hours.

8) OCCUPATIONAL SAFETY AND HEALTH

Minimum Graduating Credit - 129			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		12 – 19	9 – 15
Core Modules	*1. Fundamental Modules include Basic Sciences*	19 – 37	15 – 29
	2. Professional Modules	52 – 62	40 – 48
	*3. Industrial Training**	25 – 28	19 – 21
Optional Modules		13 – 17	10 – 13

9) OCCUPATIONAL THERAPY

Minimum Graduating Credit - 136			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		12 - 20	8 – 15
Core Modules	*1. Fundamental Modules include Basic Sciences*	18-26	13-19
	2. Professional Modules	50-58	37-43
	*3. Industrial Training**	30-44	22-32
Optional Modules		6-10	4-7

10) PARAMEDICAL SCIENCE

Minimum Graduating Credit - 132			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		12 – 15	9 - 15
Core Modules	1. *Fundamental Modules include Basic Sciences*	10 – 15	10 – 15
	2. *Professional Modules*	55 – 60	30 – 45
	3. *Industrial Training**	40 – 45	45 – 50
Optional Modules		0 – 4	0 – 5

11) PHYSIOTHERAPY

Minimum Graduating Credit – 136			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		13 -16	10 – 12
Core Modules	1. *Fundamental Modules include Basic Sciences*	30 – 36	22 – 26
	2. *Professional Modules*	53 – 56	39 – 41
	3. *Industrial Training**	30 – 32	22 – 24
Optional Modules/ *Elective Placement*		2 – 4	1 - 3

12) RADIATION THERAPY

Minimum Graduating Credit - 130			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		13 – 20	10 – 15
Core Modules	1. *Fundamental Modules include Basic Sciences*	13 – 26	10 – 20
	2. *Professional Modules*	52 – 65	40 – 50
	3. *Industrial Training**	30 – 40	23 – 30
Optional Modules		0 – 4	0 – 3

SPEECH SCIENCES

Minimum Graduating Credit - 128			
Component		**Credits**	**Percentage**
Compulsory Modules (General and HEP modules)*		13 – 20	10 – 15
Core Modules	1. *Fundamental Modules include Basic Sciences*	20 – 33	15 – 25
	2. *Professional Modules*	52 – 65	40 – 50
	3. *Clinical Modules****	20 – 33	15 – 25
Optional Modules		5 – 10	4 – 8

Note:

* 12-14 credits as prescribed by the Malaysian Ministry of Education (MOE) (Refer to *Buku Panduan Mata Pelajaran Pengajian Umum Institut Pengajian Tinggi, MPU*).

**Includes Clinical or Professional Placement or Supervised Professional Placement.

Recommended delivery methods:

    i.   Lectures

    ii.   Tutorials

    iii.   Case study

    iv.   Problem-based learning

    v.   Interactive learning

    vi.   self-directed learning

    vii.   blended learning

    viii.   Guest lecture series (prominent speakers from the industry and academic)

    ix.   Experiential learning

Training Instrument

    i.   Syllabus-Theory and Clinical

    ii.   Procedural Booklet (for classroom teaching-learning)

    iii.   Clinical Learning Package

        a.   Guideline of Clinical Practice

        b.   Clinical Record Practice (To record clinical learning experience)

            - Logbook   (Checklist of task)

            - Competency Booklet   (Core Skill Practice)

            - Assignment/Reflective Diary   (Learning/Thinking Process)

Speech Sciences

***Includes Clinical Practicum and Supervised Professional Placement (Industrial Training).

350 clinical hours with a minimum of 200 direct student-client contact hours

Supervised Professional Placements:

• Use notional credits units with 80% effective learning time with full supervision.

• 4 credit unit = full, 5 days a week for 4 weeks.

***Note: What to count as direct student-client hours

- Direct student-client contact hours earned in clinical practice.

- Partially participation clock hours which include student time as assistant in data collection and/or in therapy.

- Hours earned for counselling clients, or counselling and/or training caregivers.

- Hours spent in obtaining or giving assessment and management information (including taking a case history, interviewing the clients and the client's family, discussing diagnosis and recommendations with the clients or the client's family).

- Hours spent in speech screening clinic either on campus or off campus.

- Preparation time does not count as direct student-client contact hours (including time for calibrating and preparing equipment, writing reports and developing therapy plans).

- Hours spent in parents training with a close supervision from supervisor.

MASTER'S DEGREE

<table>
<tr><th colspan="3">MASTER'S DEGREE by RESEARCH</th></tr>
<tr><td>Component</td><td>Credits</td><td>Percentage (%)</td></tr>
<tr><td>Dissertation</td><td>No given credit value</td><td>100</td></tr>
</table>

Note:

i.   Students are required to undertake research in a related field of study and submit a dissertation.

ii. The programme must include appropriate training in research methodology.

iii. The HEP must have a set of procedures and guidelines pertaining to:

   a) Minimum and maximum periods of candidature.

   b) Format of the dissertation.

   (Refer to the Standards: Master's and Doctoral Degree).

<table>
<tr><th colspan="3">MASTER'S DEGREE by COURSEWORK
Minimum Graduating Credits - 40</th></tr>
<tr><td>Components</td><td>Credits</td><td>Percentage (%)</td></tr>
<tr><td>Core</td><td>8 - 16</td><td>20 - 40</td></tr>
<tr><td>Specialisation</td><td>14 - 18</td><td>25 - 45</td></tr>
<tr><td>Electives</td><td>4 - 6</td><td>10 - 15</td></tr>
<tr><td>Research Projects</td><td>6 - 14</td><td>15 - 35</td></tr>
<tr><td>Total</td><td>40</td><td>100</td></tr>
</table>

Note:Coursework components must include research methodology.(Refer to the Standards: Master's and Doctoral Degree).

For **physiotherapy** Master degree by coursework programme:

MASTER'S DEGREE by COURSEWORK		
Minimum Graduating Credits – 40		
Components	**Credits**	**Percentage (%)**
Core	5 -11	13 – 28
specialization	14 - 16	35 - 40
Electives / practicum	8 - 9	20 – 23
Research Projects	6 - 11	15 – 28
Total	40	100

Note:Coursework components must include research methodology.(Refer to the Standards: Master's and Doctoral Degree).

MASTER'S DEGREE by MIXED MODE		
Minimum Graduating Credits - 40		
Components	**Credits**	**Percentage (%)**
Core	12 – 20	30 – 50
Electives	0 – 4	0 – 10
Dissertation*	20 – 28	50 – 70
Total	40	100

  i. Coursework components must include research methodology.
  ii. Ratio of coursework to dissertation is within the range of 50:50 or 40:60 or 30:70.

(Refer to the Standards: Master's and Doctoral Degree).

Recommended delivery methods:

  i. Lectures
  ii. Industrial visits
  iii. Case study
  iv. Supervision of dissertation
  v. Problem-based learning
  vi. Guest lecture series (prominent speakers from the industry and academic institutions)
  vii. Interactive learning
  viii. Research seminars/workshops

DOCTORAL DEGREE

DOCTORAL DEGREE by RESEARCH		
Component	**Credits**	**Percentage (%)**
Dissertation	No given credit value	100

DOCTORAL DEGREE by COURSEWORK Minimum Graduating Credits - 80		
Components	**Credits**	**Percentage (%)**
Core	8 – 16	20 – 40
Specialisation	14 – 18	25 – 45
Electives	4 – 6	10 – 15
Research Projects	6 – 14	15 – 35
Total	40	100

DOCTORAL DEGREE by MIXED MODE Minimum Graduating Credits - 80		
Components	**Credits**	**Percentage (%)**
Core	24 – 40	30 – 50
Thesis*	40 – 56	50 – 70
Total	80	100

Note:

i. Coursework components must include research methodology.

ii. Ratio of coursework to research is within the range of 50:50 or 40:60 or 30:70.

(Refer to the Standards: Master's and Doctoral Degree).

Recommended delivery methods:

i. Lectures

ii. Supervision of theses

iii. Problem-based learning

i. Guest lecture series (prominent speakers from the industry and academic institutions)

iv. Research seminars/workshops/conference

v. Interactive learning/publication

ASSESSMENT OF STUDENT LEARNING

Assessment is important to drive student learning and to measure the achievement of learning outcomes. Although there are many assessment methods, specific method of assessment will depend on the requirement of each module.

The following guidelines should be used for assessment:

- both summative and formative assessments;
- knowledge and understanding (the cognitive domain) tested through written, oral or any suitable means
- practical skills tested by practical examinations;
- practical examination is compulsory (**A pass** implies that the examiner is satisfied with the candidates competency to practise safely, meeting the expectations of the professions);

The following types of assessments are merely examples. HEPs are encouraged to use a variety of methods and tools appropriate for the learning outcomes and competencies. **For undergraduate and postgraduate by coursework programmes, shall be evaluated where appropriate through:**

- Examination - Final examination, test, viva voce, closed/open book.
- Coursework - Assignments, quiz, laboratory report
- Project - Individual / Group, final year project, dissertation
- Others - Class participation, group activities, seminar/colloquium and presentation

For Master's and PhD by Research only:

i. Continuous assessment must include:

   a) Monitoring of research progress periodically (for example, through a progress report, a proposal defence). This will assess the candidate's knowledge, critical thinking, practical, technical, professional, scientific and problem solving skills.

   b) Research presentation / colloquium / seminar / workshop. This will enhance the candidate's communication skills, teamwork, leadership, organisational skills, lifelong learning and professionalism.

ii. Summative assessment is used to assess all learning outcomes of a master's programme, and must include:

   a) completion of prescribed courses;
   b) dissertation;

c) peer-reviewed journal; and

d) viva voce. (if required by HEPs).

iii. Summative assessment is used to assess all learning outcomes of a doctoral programme, and must include:

a) completion of prescribed courses;

b) thesis;

c) in peer-reviewed journal and

d) viva voce.

The following are the assessment descriptions of different qualification levels:

| QUALIFICATIONS | MODULES (candidates required to fulfil both assessment criteria) | | SUGGESTED METHODS OF ASSESSMENT |
	CONTINUOUS ASSESSMENT (%)	FINAL ASSESSMENT* (%)	
DIPLOMA Minimum passing CGPA is 2.00.	30-60%	40-70% (all core courses require final examination)	• Theory – Objectives Questions: • Multiple Choice Questions (MCQ), • Short Essay Questions (SEQ), • Mixed Essay Questions (MEQ) • Project report/s • Skills – Practical examination, case study presentations, • Objective Structured Clinical Examination (OSCE) • Objective Structured Practical Examination (OSPE) • Final clinical examination (where relevant) – examined by 2 suitably qualified examiners with one external examiner
BACHELOR'S DEGREE Minimum passing CGPA is 2.00	30-60%	40-70%	• Theory – Objectives Questions • Multiple Choice Questions (MCQ), • Short Essay Questions (SEQ), • Mixed Essay Questions (MEQ) • Skill – Practical examination, case study presentations, • Objective Structured Clinical Examination (OSCE) • Objective Structured Practical Examination (OSPE) • Final clinical examination (where relevant) – examined by 2 suitably qualified examiners with one external examiner • Final Year Project with dissertation – not more than

			20,000 words and examined by 2 examiners
MASTER'S DEGREE BY RESEARCH			• Thesis of 40,000-50,000 words
MASTER'S DEGREE BY COURSEWORK Minimum passing CGPA is 3.00			• Projects/dissertation of 20,000–30,000 words
MASTER'S DEGREE BY MIXED MODE Minimum passing CGPA is 3.00			• Projects/dissertation of 30,000–40,000 words
DOCTORAL DEGREE BY RESEARCH			• Thesis of 60,000 – 80,000 words and viva voce • One article accepted for publication in peer-reviewed journal
DOCTORAL DEGREE BY COURSEWORK			• Projects/dissertation of 40,000 – 50,000
DOCTORAL DEGREE BY MIXED MODE Minimum passing CGPA is 3.00			• Dissertation of 50,000 – 60,000 words and viva voce

For paramedical science, the above standard must be complied with the requirement below:

| QUALIFICATIONS | MODULES (candidates required to pass both) | |
	CONTINUOUS ASSESSMENT (%)	FINAL ASSESSMENT* (%)
DIPLOMA Minimum passing CGPA is 2.00.	30-60%	40-70% (all core courses require final examination)
BACHELOR'S DEGREE Minimum passing CGPA is 2.00	30-60%	40-70%
Diploma/Bachelor Clinical Paramedical Course	1. 30-40% (non clinical placement module) 2. 60-70% (clinical placement module)	1. 60-70% (non clinical placement module) 2. 30-40% (clinical placement module)

Industrial Training

Responsible	Practicum assessment	Percentage (%)
Student	• Attendance (by hours) • Log book/ work records • Self-reflective diary/journal / personal files • Personality assessment	20 - 30
Field supervisor / Local preceptor	• Qualitative • Rubric • Practical competency assessment	30 - 40
Academic supervisor / Clinical instructor / visiting lecturer	• Report and presentation • Practical competency assessment • End of posting assessment*	40 – 50

* Student must pass end of posting assessment

Training assessment tools:

- Attendance (by hours)
- Log book
- Supervisor / Preceptor / Instructor Reports (over a period of time)
    - Summative

- - - Qualitative
  - Quantitative
  - Formative
  - Rubric
- Case study write-up/report and presentation
- Clinical/Practical competency assessment
- Self-reflective diary/journal
- Professionalism

Method:
- Observation
- Practicum
- Examination
- Report and presentation

Compositions of dissertation/thesis examiners as prescribed in the MQA Standards: Master's and Doctoral Degree are as follows:

a. Master's Degree by Mixed Mode

The dissertation is to be examined by at least two examiners.

b. Master's Degree by Research

The dissertation is to be examined by at least two examiners, one of whom is an external examiner.

c. Doctoral Degree by Coursework

The thesis is to be examined by at least two examiners, one of whom is an external examiner.

d. Doctoral Degree by Mixed Mode

The thesis is to be examined by at least two examiners, one of whom is an external examiner.

e. Doctoral Degree by Research

The thesis is to be examined by at least three examiners, two of whom are external examiners.

HEPs should have a clear policy on the appointment of external examiners.

STUDENT SELECTION

This section of the Programme Standards concerns the recruitment and selection of students into the individual programme of study.

The selection policy must be in compliance with Ministry of Higher Education minimum benchmark standards. The following are the criteria for different level of qualifications:

Ref:
"In general, admission policies of the programme need to comply with the prevailing policies of the Malaysian Ministry of Education (MOE). There are varying views on the best method of student selection. Whatever the method used, the higher education provider (HEP) must be able to defend its consistency. The number of students to be admitted to the programme is determined by the capacity of the HEP and the number of qualified applicants. HEP admission and retention policies must not be compromised for the sole purpose of maintaining a desired enrolment. If an HEP operates geographically separated campuses or if the programme is a collaborative one, the selection and assignment of all students must be consistent with national policies," *(COPPA, pp. 17)*.

DIPLOMA[1]
For all subfield except Occupational Safety and Health and Health Care Management
i) SPM or equivalent with PASS in Bahasa Malaysia and English and 5 credits in the following subjects:

- Mathematics;
- ONE science subject (Biology/Physics/Chemistry/General Science/Applied Science); and
- Any other THREE subjects (including Bahasa Malaysia and/or English).

OR

ii) GCE/O Level or equivalent with PASS in Bahasa Malaysia or English and 5 Grade C in the following subjects:

- Mathematics;
- ONE science subject (Biology/Physics/Chemistry/General Science/Applied Science); and

---

[1] Amendments as in MQA Circular Letter No. 1/2018 with reference no. MQA.100-1/7/2 (3) dated January 26th, 2018.

- Any other THREE subjects (including Bahasa Malaysia and/or English).

   OR

iii) Certificate related to Health Sciences with minimum CGPA 2.75

For Occupational Safety and Health and Health Care Management[2]

i) SPM or equivalent with PASS in Bahasa Malaysia and English and 3 credits in the following subjects:
- Mathematics or ONE science subject (Biology/Physics/Chemistry/General science); and
- Any other TWO subjects (including Bahasa Malaysia and/or English).

   OR

ii) GCE/O Level or equivalent with PASS in Bahasa Malaysia and English and 3 credits (Grade C) in the following subjects:
- Mathematics or ONE science subject (Biology/Physics/Chemistry/General science); and
- Any other TWO subjects (including Bahasa Malaysia and/or English).

   OR

iii) Certificate related to Health Sciences with minimum CGPA 2.50

BACHELOR DEGREE

i) Obtained MUET Band 3 or IELTS (5.5)/TOEFL (550)

   AND

   a) PASS Matriculation/Pre-University/STPM programme or equivalent qualification with minimum **GPA 2.33** in TWO of the following subjects:
   - Biology
   - Physics/Mathematics
   - Chemistry

   OR

   b) A-Level programme or equivalent qualification with minimum **Grade D** in TWO of the following subjects:
   - Biology
   - Physics/Mathematics

---

[2] Amendments as in MQA Circular Letter No. 1/2018 with reference no. MQA.100-1/7/2 (3) dated January 26th, 2018.

- Chemistry

OR

c) Recognised Diploma with minimum CGPA of 2.75 in related field;

OR

d) Recognised Diploma with CGPA less than 2.75 in related field and a minimum of 3 years (36 months) working experience in the related field.

English proficiency for foreign student

Candidate should obtain IELTS (5.5)/TOEFL (550) paper-based or equivalent.

MASTER DEGREE

Master Degree by Research

i) A bachelor degree or equivalent with minimum CGPA of 2.75 in related field, as accepted by the HEP Senate; or

ii) A bachelor degree or equivalent with CGPA between 2.50 and 2.75, can be accepted subject to rigorous internal assessment; or

iii) A bachelor degree or equivalent in related field with CGPA of less than 2.50 and a minimum of 5 years working experience in the related field

Master Degree by Coursework

i) A bachelor degree or equivalent with minimum CGPA of 2.50 in related field, as accepted by the HEP Senate; or

ii) A bachelor degree or equivalent in related field with CGPA of less than 2.50 and a minimum of 5 years working experience in the related field

Master Degree by Mixed Mode

i) A bachelor degree or equivalent with minimum CGPA of 2.75 in related field, as accepted by the HEP Senate; or

ii) A bachelor degree or equivalent with CGPA of between 2.50 and 2.75, can be accepted subject to rigorous internal assessment; or

iii) A bachelor degree or equivalent with CGPA of less than 2.50 in related field and a minimum of 5 years working experience in the related field

DOCTORAL DEGREE

Doctoral Degree by Research

i) A master's degree accepted by the HEP Senate; or

ii) Other qualifications equivalent to a master's degree that are accepted by the HEP Senate.

Note:

   i.   No direct entry from bachelor's degree level to doctoral degree level.

  ii.   Candidates with bachelor's degree who are registered for master's degree programmes may apply to convert their candidacy to the doctoral degree programmes within ONE (1) year after master's degree registration, subject to:

     a) having shown competency and capability in conducting research at doctoral degree level

     b) rigorous internal evaluation by the HEP

     c) approval by the HEP Senate.

PhD by Published Work

The applicant must have publications that contribute to the scholarship of knowledge in the field and are acknowledged by academic peers. A formal application must be submitted to the Office of the Registrar and must include:

     i. minimum of 5 publications in alignment with the theme of the specialization;

    ii. an executive summary of the above publications to demonstrate the applicant's contribution to knowledge in the field; and

    iii. a list of scholarly published work.

A Selection Committee must be established to review the formal application of the PhD by published work, and recommend to the Senate the admission to candidature.

Doctoral Degree by Coursework and Mixed Mode

i) A master's degree accepted by the HEP Senate; or

ii) Other qualifications equivalent to a master's degree that are accepted by the HEP Senate.

ACADEMIC STAFF

The quality of the academic staff determines of quality of teaching and learning. It is important to select and recruit qualified academic staff.

All academic staff are required to undergo continuous professional development, including pedagogical training, for a minimum of 7 days in a year. Academic staff are encouraged to participate in research, consultancy and community activities.

Work and its equitable distribution is one of the ways the HEP recognises meritorious contribution for the purpose of promotion, salary determination or other incentives. It is crucial for the HEP to provide training for its academic staff. The equitable distribution of work helps ensure that such training can be done systematically and fairly," *(COPPA, 2008,* pp. 21).

The following are the criteria for the academic staff according to the level of qualifications:

DIPLOMA

Academic staff qualification
1. Minimum qualification of academic staff:
   ▪ Bachelor's Degree in related field with 3 years working experience or equivalent in related field;
   OR
   ▪ Diploma in related field with minimum of 8 years working experience or equivalent in related field.

   Minimum academic staff qualification for Paramedical Science:
   1.1. Basic Medical Science Lecturer
      ▪ Bachelor's Degree in related field with 3 years working experience or equivalent in related field.
   1.2. Professional Subject Lecturer
      ▪ Bachelor's Degree in related field with 3 years working experience or equivalent in related field and still active in clinical practice; **OR**
      ▪ Diploma in related field with minimum of 8 years working experience or equivalent in related field and still active in clinical practice.

Minimum qualification of:

➢ Local Preceptors:
- Diploma in related field with at least 5 years working experience or equivalent in related field.
- Bachelor degree in related field with at least 3 years working experience or equivalent in related field.

➢ Clinical instructor:
- Diploma in related field with at least 5 years working experience or equivalent in related field
- Bachelor degree in related field with at least 3 years working experience or equivalent in related field.

Academic staff ratio

1. The ratio between full time and part time teaching faculty is 4:1.
2. At least one of the permanent faculty members is qualified in the respective field.
3. For paramedical science, there must be a minimum one (1) practising Emergency Medicine Specialist registered with National Specialist Register in Malaysia as an academic staff.
4. Minimum number of academic staff for each programme – 6*

Staff-student ratio

1. Academic staff-student ratio is 1:20.
2. Clinical training with suitably qualified local preceptor and clinical instructor:
➢ Local Preceptors -student ratio is 1:8
➢ Clinical/field instructor in service-student ratio is 1:6

BACHELOR DEGREE

Academic staff qualification

1. Minimum qualification of academic staff:
   - Master Degree in related field with at least 1 year working experience or equivalent in related field; **OR**
   - Bachelor Degree in related field with 5 years working experience or equivalent in related fields (in situation where there is a lack of master degree holders).

2. Minimum qualification of:
   - Local Preceptors:
     - Bachelor degree with 3 years professional experience or equivalent; **OR**
     - Diploma with 5 years professional experience or equivalent in related field. (in situation where there is a lack of bachelor degree holders)

   - Clinical Instructor:
     - Bachelor degree with 3 years professional experience or equivalent
     - Diploma with minimum 8 years professional experience or equivalent in related field. (in situation where there is a lack of bachelor degree holders)
     - Additional qualification for paramedical science: Diploma with post basic in related field and 5 years experience in related field

Academic staff ratio

1. The ratio between full time and part time teaching faculty is 4:1.
2. At least one of the permanent faculty members is qualified in the respective field.
3. Minimum number of academic staff for each programme – 10*

Staff-student ratio

1. Academic staff-student ratio is 1:20.
2. Clinical training with suitably qualified local preceptor and clinical instructor:
   - Local Preceptor -student ratio is 1:8
   - Clinical/field instructor in service-student ratio is 1:6

MASTER DEGREE

Academic staff qualification

1. Minimum qualification of academic staff:
   - Doctoral Degree
   - Master's Degree with at least 5 years experience:

     a) in teaching and research; or

     b) as a co-supervisor.
   - Master degree by research must be supervised by holder of master degree by research
   - The additional criteria are subjected to the approval of the HEP Senate

Academic staff ratio

1. The ratio between full time and part time teaching faculty is 1:1.
2. Minimum number of academic staff for coursework/mixed mode programme: 5*

Staff-student ratio

1. Maximum academic staff-student ratio (coursework/mixed mode) is 1:10.
2. Maximum academic staff-student ratio (research) is 1:5

DOCTORAL DEGREE

Academic staff qualification

1. Minimum qualification of academic staff:
   - Doctoral Degree with 3 years working experience including supervision at Master Degree level.

Academic staff ratio

1. The ratio between full time and part time teaching faculty is 1:1.
2. Minimum number of academic staff for coursework/mixed mode programme:10*

Staff-student ratio

1. Maximum academic staff-student ratio is 1:4.

Note:

*Refer to Surat Makluman MQA Bil. 7/2014 – Garis Panduan Beban Staf Akademik.

EDUCATIONAL RESOURCES

Sufficient educational resources are required to support the teaching learning of a programme. Resources such as finance, expertise, physical infrastructure, information and communication technology, and research facilities must be made available to the students according to the specific field of study.

Other faciliites which support effective teaching and learning include dormitories, transport, security, recreation and counselling should be available.
(COPPA, 2008, pp. 23-24).

The following are the generic educational resources. Resources specific to the field and/or level of qualification are provided in **Appendix 3**.

1. **Physical**
    a. Lecture hall and seminar/tutorial rooms
    b. Basic sciences laboratories e.g. anatomy laboratories and physics laboratories.
    c. Computer laboratories
    d. Library/resource centre
    e. Skill/simulation laboratories.

2. **Clinical training / field work / industrial training**
    - hospitals
    - healthcare facilities
    - industries
    - health and fitness centre

3. **Relevant online educational database and e-learning facilities**

LEADERSHIP, GOVERNANCE AND ADMINISTRATION

The success of managing a programme depends on good academic leadership. The leader of the programme should demonstrate knowledge, leadership skills and good ethical values.

This document will not raise issues pertaining to the governance and administration, as these are the responsibility of the institution but it focuses on qualified individual to carry out the necessary curriculum monitoring and review of medical and health sciences development. The leaders of the programme should meet the requirement based on the level of qualifcations. The following are the criteria of the programme leadership *(e.g., Coordinator, Head of Department or Head of Programme*) qualification:

 "There are many ways of administering an educational institution and the methods of management differ between HEPs. Nevertheless, governance that reflects the leadership of an academic organisation must emphasise excellence and scholarship. At the departmental level, it is crucial that the leadership provides clear guidelines and direction, builds relationships amongst the different constituents based on collegiality and transparency, manages finances and other resources with accountability, forge partnership with significant stakeholders in educational delivery, research and consultancy and dedicates itself to academic and scholarly endeavours. Whilst formalised arrangements can protect these relationships, they are best developed by a culture of reciprocity, mutuality and open communication," (*COPPA*, 2008, pp. 28).

DIPLOMA

1. Master degree in related professional field;
   OR
2. Bachelor degree in related professional field with 5 year teaching experience; **AND** 5 years related professional practice experience.

BACHELOR DEGREE

Master degree in related professional field; **AND** 5 years teaching experience; **OR** 3 years related professional practice experience.

MASTER DEGREE

1. Doctoral in related professional field; **AND** 3 years teaching experience; **OR** 3 years related professional practice experience;
   OR
2. Master degree in related professional field; **AND** 10 years teaching and research experience; **OR** 5 years related professional practice experience.

DOCTORAL DEGREE

Doctoral in related professional field; **AND** 5 years teaching and research experience; **OR** 5 years related professional practice experience.

PROGRAMME MONITORING AND REVIEW

Quality enhancement calls for programmes to be regularly monitored, reviewed and evaluated. This includes the monitoring, reviewing and evaluating of institutional structures and processes (administrative structure, leadership and governance, planning and review mechanisms), curriculum components (syllabi, teaching methodologies, learning outcomes) as well as student progress, employability and performance.

Feedback from multiple sources – stakeholders, students, alumni, academic staff, employers, professional bodies, parents – assist in enhancing the quality of the programme. Feedback can also be obtained from an analysis of student performance and from longitudinal studies.

Measures of student performance would include the average study duration, assessment scores, passing rate at examinations, success and dropout rates, students' and alumni's report about their learning experience, as well as time spent by students in areas of special interest. Evaluation of student performance in examinations can reveal very useful information. If student selection has been correctly done, a high failure rate in a programme, indicates something amiss in the curriculum content, teaching-learning activities or assessment system. The programme committees need to monitor the performance rate in each course and investigate if the rate is too high or too low.

Student and industry feedback, for example, through questionnaires and representation in programme committees, is useful for identifying specific problems and for continual improvement of the programme.

One of the various methods that can be employed to evaluate programme effectiveness is the longitudinal study of the graduates. The department should have mechanisms for monitoring the performance of its graduates and for obtaining the perceptions of society and employers on the strengths and weaknesses of the graduates and to respond appropriately. (COPPA, 2008 pp. 27).

CONTINUAL QUALITY IMPROVEMENT

The HEPs are expected to provide evidence of ability to keep pace with changes in the field and requirements of stakeholders. These may be demonstrated by, but not limited to:

1. curriculum review, conducted at least once every 3 - 5 years;
2. appointment of external reviewer/examiner for quality assessment processes;
3. linkages with industry;
4. continuous review of industrial/clinical attachment/ posting practices and records;
5. dialogue sessions with stakeholders at least once every 2 years;
6. active participation of academic staff at relevant conferences, seminars, workshops and short courses;
7. presentations by invited speakers, local or international; and
8. organisation of conferences, seminars and workshops.

"Increasingly, society demands greater accountability from the higher education providers (HEPs). Needs are constantly changing because of the advancements in science and technology, and the explosive growth in global knowledge, which are rapidly and widely disseminated. In facing these challenges, HEPs have little choice but to become dynamic learning organisations that need to continually and systematically review and monitor the various issues so as to meet the demands of the constantly changing environment," *(COPPA, 2008,* pp. 30-31).

APPENDIX 1: PANEL MEMBERS

No.	Name	Organisation
1.	**Prof. Dato Sri Dr Abu Hassan Asaari Abdullah -CHAIRMAN-**	Hospital Kuala Lumpur
2.	**Prof. Norimah A. Karim**	Nutrition Society of Malaysia
3.	**Prof. Fatimah binti Arshad**	International Medical University
4.	**Prof. Jamal Hisham Hashim**	United Nations University-International Institute for Global Health UKM Medical Centre
5.	**Prof. Dr. M. K. Vidyadaran a/l M.P.K. Menon**	University Tunku Abdul Rahman (UTAR)
6.	**Prof. Madya Dr. Zafir Khan Mohamed Makhbul** Alternate member: Dr. Siti Noorsuriani Ma'on	Universiti Kebangsaan Malaysia Universiti Teknologi Mara (UiTM)
7.	**Prof. Madya Chan Sook Chin**	MAHSA University
8.	**Dr. Ahmad Fitri bin Abdullah Hair**	Department of Occupational Safety and Health (DOSH)
9.	**Dr. Mohd Hanafi Ali**	Universiti Teknologi MARA
10.	**Puan Roslina Ibrahim**	Kementerian Kesihatan Malaysia
11.	**Encik Zulkifli Abdul Ghani**	Kolej Sains Kesihatan Bersekutu
13.	**Prof. Madya Dr. Rahayu Mustaffa Kamal**	Universiti Islam Antarabangsa
14.	**Dr. Yazmin Ahmad Rusli**	Universiti Kebangsaan Malaysia
15.	**Dr. Shobha Sharma**	Universiti Kebangsaan Malaysia
16.	**Dr. Hasherah Mohd Ibrahim**	Universiti Kebangsaan Malaysia
17.	**Encik Khairy Anuar Mohd Khairuddin**	Universiti Sains Malaysia
18.	**Puan Azlinda Abd Ghani**	Universiti Sains Malaysia
19.	**Dr. Nor Azrita Mohamed Zain**	Universiti Islam Antarabangsa

APPENDIX 2: BODY OF KNOWLEDGE

<u>**DIPLOMA**</u>

The proposed body of knowledge within the programme structure is a **GUIDE** in the delivery of medical and health sciences programmes. Teaching in the classroom is theory based whilst practical teaching includes lab-based teaching, demonstrations, site visits/field trips, and simulated clinical/practical training, which exclude clinical placement, industrial attachments and professional development training.

1. Diploma in Medical Laboratory Technology

Component	Body of knowledge
Fundamental Modules include Basic Sciences	- Introduction to Human Anatomy & Physiology - Introduction to Biochemistry - Biostatistics and Epidemiology - Laboratory Sciences & Instrumentation - Introduction to Health Informatics
Professional Modules	- Clinical Biochemistry - Clinical Microbiology - Hematology - Immunology - Pathology - Parasitology - Transfusion Science & Blood Banking - Histopathology - Cytopathology - Genetics & Molecular Biology - Research Methodology
Industrial Training	Practicum / Clinical Attachment

2. Diploma in Environmental Health

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	• Introduction to Human Anatomy and Physiology • Chemistry • Mathematics • Microbiology and Parasitology • Physics
Professional Modules	• Introduction to Environmental Health • Introduction to Soil and Hydrogeology • Sewage and Wastewater Disposal • Water Supply and Quality • Food Technology • Organisational Management • Food Hygiene and Safety • Introduction to Health Risk Assessment • Introduction to Environmental and Industrial Toxicology • Vector and Pest Control • Epidemiology and Biostatistics • Introduction to Solid and Hazardous Management • Environmental and Occupational Health Legislation • Disease Control • Land use and Housing • Health Promotion and Ethics • Introduction to Research Methodology • Occupational Safety and Health • Pool and Recreational Water • Enforcement and Legal Procedures • Built Environment and Technology • Partial Data and Disease Mapping • International Health

Component	Body of Knowledge		
Industrial training (25 weeks - practicum log book is compulsory)		**Modules**	**Description**
		International Health and Entry Points (airport, sea port and border) – 1 week	i. Inspection of ships/aircraft ii. Manifest inspection iii. Inspection of health documentation iv. Water and food sampling v. Fumigation vi. Screening of international travellers vii. Pest and vector control activities (rodent and Aedes free perimeters)
		Environmental health practical training with MOH – minimum 6 weeks	i. Food sampling and premise inspection ii. Pest and vector control activities iii. Water sampling and monitoring activities (public and private) iv. Disease control activities v. Occupational health and safety activities vi. Health risk assessment of water supply vii. Disease outbreak and disaster management viii. Health promotion activities ix. Legal procedure • Investigation procedures • Court procedures • Investigation files • Prosecution procedures

Component	Body of Knowledge		
	Environmental health experience in local government authorities – minimum 6 weeks	i. Solid waste and waste water management	
		ii. Inspection of public facilities (hotel, market, theatre, amusement park etc.)	
		iii. Nuisance investigation and abatement.	
		iv. Food premise inspection (industry, food court, eating house, stall, etc	
		v. Legal procedures and related law.	
		vi. Health promotion activities	
	Industrial training in the private sector with relevant industries - minimum 4 weeks	i. Introduction to the organisation	
		ii. Occupational safety and health management	
		iii. Industrial hygiene practices	
		iv. Emergency and response	
		v. Food safety and quality	
		vi. Pest and vector control activities	
		vii. Waste management and water quality	
		viii. Air and water pollution control	

3. Diploma Healthcare Management

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	• Introduction to Human Anatomy and Physiology • Introduction to Health Care and Disease Prevention • Introduction to Psychology • Terminology in Health Care Management
Professional Modules	• Introduction to Accounting • Principles of Management and Its Application in Health Care Services Management • Introduction to Organisational Behaviour • Principles of Health Care System, Service and Management • Introduction Medico legal and Bio Ethics • Principles of Health Finance and Economy • Health Care Programme Planning and Evaluation • Organisational Development and Transformation • Emergency and Disaster Management • Introduction to Health Education and Promotion • Health Care System – Rural/Urban, Private / Public • Health Safety and Risk Management - should be a basic at this level. • Human Resource, and its Application in Hospital & Health Care Management • Leadership and Conflict Resolution in Health Care Institutions • Assist in Planning, Designing and Management of Clinical Services Departments – Wards Units, OPDs, ICU, A & E, OT* • Supportive Services – Laboratory, CSSD, Dietary, Linen &Laundry, Utility – Sanitation & Hospital Waste Disposal * • Quality Management & Hospital Accreditation System • National Health Policy • Communication Skills • Socio-Cultural Aspect of Health and Health Care • Epidemiology • Biostatistics • Health Informatics and Health Information Management (Record Management, Medical Coding) • Industrial Training***

Industrial Training	*A health management professional is an individual who provides administrative/management support for the delivery of healthcare services. Therefore, the students will not involve directly in clinical aspects and do not have direct contact with the patients. The main employers are hospitals, nursing care and residential care facilities and doctors' offices. Industrial training supervision does not require specific preceptors.*

* **exposure to the real practices such as industrial visits**

4. Diploma in Medical Imaging

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	• Human Anatomy and Physiology • General Physics • Radiation Physics • General Pathology • Systemic Pathology • Basic Human Psychology (Behavioral Science)
Professional Modules	• Patient Care in Radiography • Radiographic Instrumentation • General Radiographic Technique • Advanced Radiographic Technique • Conventional and digital Image Processing • Radiographic Anatomy • Radiographic Image Evaluation • Radiographic Pathology • Sectional Anatomy • Introduction to Other Imaging Modalities (MRI, US, RNI) • Computed Tomography (Physics, Instrumentation & Technique) • Professionalism and Ethics in Radiography / medical Imaging • Radiobiology and Radiation Safety • Introduction to Healthcare Management • Introduction to Quality Assurance in Radiography • Basic Pharmacology

Component		
Industrial Training	**Modules**	**Description**
	Clinical I	• Chest and upper airways • Abdomen • Shoulder girdle • Pelvic girdle • Upper and lower extremities • Bony thorax • Vertebral column radiography

Component	Body of Knowledge	
	Clinical II	• Skull
		• Facial bones
		• Urinary system
		• Digestive system
		• Biliary system
		• Paediatric radiography
		• Geriatric radiography
		• Mobile radiography
		• Forensic radiography
		• The use of contrast media for radiographic procedures
		OSPE will be conducted at the end of the clinical block
	Clinical III	• Mammography
		• Hysterosalpingography
		• Arteriography
		• Dental radiography
		• Revision Topics:
		○ general X-ray department
		○ operating theatres,
		○ ward trauma/accident
	Clinical IV	Advanced radiographic experiences in:
		• Operating theatres
		• Ward
		• Trauma/accident
		• Emergency radiography
		• Specialized procedures
		• Computed Tomography unit
		OSPE will be conducted at the end of the clinical block.

5. Diploma in Occupational Safety and Health

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Human Anatomy and Physiology - Chemistry - Basic psychology - Microbiology - Physics
Professional Modules	- Principles in Occupational Safety and Health - Occupational Safety and Health Laws - OSH Management System - OSH Risk Management - Emergency Response and Planning - Hazardous Substances - OSH Communication - Fire Safety - Machinery Safety - Principles of Toxicology - Introduction to Occupational Epidemiology - Principles of Ergonomics - Industrial Hygiene - OSH Services - Occupational Diseases - Behavioural Based Safety - OSH Promotion - Personal Protective Equipment - Rehabilitation and Fitness -to-Work - Organizational Leadership - OSH Audit - OSH Surveillance and Monitoring - Accident Investigation
Industrial Training(practicum log book is compulsory)	- Legal requirement - OSH management system - Conduct HIRARC (*Hazard Indentification, Risk Assessment and Risk Control*) - A case study and report

6. Diploma in Occupational Therapy

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	• Behavioral science • Anatomy • Physiology • Neuroscience • Biomechanics / kinesiology • Medical • Orthopaedic and Surgical • Neurology • Mental health • Geriatric • Ergonomic • Basic Patient Care
Professional Modules	• Foundation in Occupational therapy • Occupational Analysis • Professional development • Occupational therapy assessment (physical*) • Occupational therapy assessment (psychosocial) • Occupational therapy assessment (paediatric) • Occupational therapy Intervention (physical) • Occupational therapy Intervention (psychosocial) • Occupational therapy Intervention (paediatric) • Occupational therapy application (physical) • Occupational therapy application (psychosocial) • Occupational therapy application (paediatric) • Occupational therapy – Project/Proposal
Industrial Training	• Occupational therapy practice (physical, psychosocial, paediatric) (Refer **)

*Physical consist of medical, orthopaedic, neuro, surgical, geriatric.

**Refer to Clinical Training Guideline

CLINICAL TRAINING GUIDELINE (**)

All knowledge, skill and attitude learned are integrated via graded clinical exposure in the following various context of professional practice:

No	OT Competencies	The person-occupation environment relationship and its relationship to health	Therapeutic and professional relationship	An occupational therapy process	Professional reasoning and behavior	The context of professional practice
	PERFORMANCE CRITERIA	1) Philosophies Theories & Principles 2) OT Models & Frame of References for Occupational Participation 3) Standard Procedures & Safety	1) Community participation/ engagement/networking 2) Code of Ethics 3) Effective Communication &Teamwork 4) Interpersonal skill, social skill & Supervisory skill	1) Philosophies Theories & Principles 2) OT Models & Frame of References for Occupational Participation 3) Standard Procedures & Safety 4) Problem Solving & Evident Based Practice	1) Code of Ethics 2) Problem Solving&Evident Based Practice 3) Research methodologies & Information management 4) Effort for continuing competence 5) QualityService& entrepreneurial skill	Integration of all performance criteria for developing clinical competencies
DIMENSION OF CLINICAL COMPETENCIES						
1	Task Skills	Use ass &tx technique/ procedures for ethical, safety and effective practice	Assist in managing cases	Follow through procedures of isolated Assessment	Follow through scientific procedures and principles of isolated techniques	Introduction Physical & Psychosocial aspect

				& Treatment technique		
2	Task Management Skill	Explain the application of theory and philosophy of OT to enabling occupation	Works Independently in managing cases	Follow through procedures of Assessment, Planning and Treatment techniques	Follow through scientific procedures and principles of OT Process	Managing Physical & Psychosocial aspect
3	Contingency management skills	Predict the effectiveness of tx outcome to enabling occupation	Assume Teamwork/ Collaboration	Follow through complete Assessment, Planning and Treatment and Evaluation process	Adapt/ adjust behavior to suit changes	Managing Physical, Psychosocial and Pediatric aspect
4	Job role/ environment skills	Suggestion for modification/ Changes to enabling occupation	Participate In Supervisory Responsibility	To effectively and efficiently complete OT process in various context	Adheres to research methodologies to assist in arrangement/ creation/ formulation of action to solve issues	Dept Management

To effectively and efficiently use OT Process |

7. Diploma in Paramedical Science

Component	Body of Knowledge
Fundamental Modules including Basic Sciences	- Human Anatomy/Functional & Applied Anatomy - Human Physiology - Pathology - Pharmacology - Microbiology
Professional Modules	- Personality & Professional development - Behavioural Science/Psychology - Psychiatry - Surgical - Orthopaedic - Paediatric - Obstetrics and gynaecology - Medical - Community Health (Primary Health Care) - Public Health - Emergency Medicine - Disaster Medicine - Pre-Hospital Care
Industrial / Clinical Training	- Pre-Hospital Care - Emergency Medicine - Emergency Medical Dispatch - Orthopaedic - Labour room - Paediatric - Primary Health Care - Disaster Medicine

8. Diploma in Physiotherapy

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Human Anatomy - Human Physiology - Behavioral Science - Pathology - Kinesiology - Biomechanics
Professional Modules	- Professional development - Movement, handling & exercises - Electro-physical agent - Physiotherapeutic Skills - Physiotherapy in Musculoskeletal - Physiotherapy in Cardiorespiratory - Physiotherapy in Neurology - Physiotherapy in Geriatric - Physiotherapy in Paediatric - Physiotherapy in Sports - Physiotherapy in Women's Health - Physiotherapy in Occupational Health
Industrial Training	Musculoskeletal, Cardiorespiratory, Neurology Client specific: Paediatrics, sports, Women's Health, Geriatric, Occupational Heath Primary care, outpatient and inpatient
	Elective Placement: Disable Children Homes, Sport Clubs, Nursing Homes, Elderly Homes, Spastic Children, Special Need Schools, Hospices, Rehabilitation Centres

9. Diploma in Radiation Therapy

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Human Anatomy and Physiology - General Physics - Radiation Physics - General Pathology - Systemic Pathology - Basic Human Psychology - Basic Pharmacology
Professional Modules	- Patient Care in Radiation Therapy - Radiation Therapy Instrumentation (I and II) - Radiation Therapy Technique (I, II, III and IV) - Radiation Therapy Physics - Oncology (I and II) - Imaging in Radiation Therapy - Sectional Anatomy - Introduction to Advanced Radiotherapy Techniques. - Radiobiology - Professionalism and Ethics in Radiotherapy - Quality Assurance in Radiotherapy - Basic Management
Industrial Training	Radiation Therapy Practice (I, II, III, IV and V) The clinical component could be designed to complement the academic programme and runs throughout the course. The placements could be designed so that the students will be able to observe the practical application of the academic course wherever possible. Content can be tailored to meet either HEP or National needs as is deemed to be most appropriate. Phases can be introduced into a course at an appropriate time depending on the overall duration of the final programme. Assessment can be linked with academic assessment to demonstrate practical application of knowledge.

Component	Body of Knowledge	
	Modules	**Description**
	Radiation Therapy Practice I	**Introduction to the general hospital setting** To be completed very early in the training. The purpose of this phase is for the students to become familiar with some of the practical applications of the academic course to: 1. introduce the wider hospital setting. 2. help the students to identify the various disciplines within a hospital, their role and the importance of cooperation. 3. introduce patients in a clinical setting and begin to assimilate basic communication skills. The following procedures will be demonstrated to the students who will be expected to observe or participate as appropriate: • General procedures to be observed when patients attend for appointment. • Lifting and moving techniques. • Administration of bedpans, vomit bowls, etc. • Care and management of drugs in the hospital setting. • Correct procedures when dealing with patients with infectious diseases. • Universal precautions. • Correct procedures when dealing with immuno-compromised patients. • Hygiene practices. • Simple dressings. • Sterile procedures, • Oxygen administration. • Care of patients with:

Component	Body of Knowledge	
		- o breathing difficulties. - o terminal illness. - o mental impairment. - o physical disability. - Special care of the geriatric and paediatric patient. - Stoma care. - Handling of patients with bone metastases. - Care of the patient following an anaesthetic. - Care of lines in the intubated patient.
	Radiation Therapy Practice II	**Introduction to the Radiotherapy Department**. Time will be spent on each unit within the department. The purpose of this phase is to: 1. Familiarize the students with the different units within the department and the procedures carried out on each unit; 2. Enable the student to recognize and relate to the basic terminology introduced in the academic programme; 3. Help to establish a sense of identity within the student group and to understand the role of the Radiation Therapist in the management of cancer; 4. Introduce the students to the staff of the department; 5. Help the student to understand team roles; 6. Familiarize the students with written QA programmes within the department.

Component	Body of Knowledge	
	Radiation Therapy Practice III	The purpose of this phase is for the students to:
		• Begin to become competent in the manipulation of the radiation therapy equipment;
		• Be able to communicate effectively with patients;
		• Begin to integrate into the department as part of the radiotherapy and multidisciplinary teams;
		• Begin to empathize with patients and to appreciate their own feelings in the clinical situation.
		To achieve the competency level substantial time will be spent with on the following aspects:
		1. Identifying the functions on the pedestal/handset and safely operating these on the treatment units;
		2. Identifying the functions on a control panel, indicating their purpose and safely using these when appropriate;
		3. Safely using the accessory equipment in the correct context;
		4. Correctly and safely using equipment related to patient immobilization;
		5. Identifying, locating, understanding and safely using the radiation protection features incorporated in the treatment areas, e.g. door interlocks, visible and audible warning signs, primary and secondary barriers, etc;
		6. Setting up single and parallel opposed fields under supervision;

Component	Body of Knowledge
	7. Assisting in the set-up of multi field techniques;
	8. Identifying the cassettes and films commonly used for localization and verification on the simulator and treatment units;
	9. Demonstrating the correct procedure for developing films (daylight processing and dark room practice) and correctly unloading and reloading cassettes.
Radiation Therapy Practice IV	The purpose of this phase is for the students to:
	1. Demonstrate competence in the manipulation of radiation therapy equipment;
	2. Demonstrate an ability to anticipate the physical and psychological needs of the cancer patient and respond to them;
	3. Demonstrate the ability to communicate multidisciplinary treatment of the cancer patient;
	4. Increasingly participate as a team member in all aspects of the patient's management in radiation therapy in preparation to work as a qualified radiation therapist;
	5. Demonstrate competence in simulator procedures;
	6. Acquire basic computer skills;
	7. Participate in the development/revision of formal written quality assurance procedures/programme;
	8. Set up a patient on their first visit.
	To achieve final competency substantial time will be spent:

Component	Body of Knowledge
	• Setting up multi field techniques under supervision; • Participating in the quality control procedures in the department in accordance with the protocols; • Simulating and localizing a target volume; • Describing the purpose of health and safety and ionising radiation regulations; • Discussing the role of local rules and outline those in place in the different departments.

BACHELOR DEGREE

The proposed structures are merely **examples** provided as a guide in the delivery of medical and health sciences programmes. They contain a breakdown of core modules, divided into basic sciences and professional modules. The matrices also contain a suggested breakdown in relation to the weightage between theoretical and practical teaching.

Theoretical teaching is classroom based delivery of theory whilst practical teaching includes lab- based teaching, demonstrations, site visits/field trips, and simulated clinical training, but does not include postings, industrial attachments and professional development training.

1. Bachelor of Biomedical Science

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Anatomy & Physiology I - Biochemistry and Basic Genetics - Psychology and Behavioral Science - Anatomy & Physiology II - Fundamentals of Health Informatics - Biostatistics - Human Biochemistry - Epidemiology - Basic Immunology - Human Genetics - Basic Microbiology - Basic Haematology - Basic Pharmacology - Basic Pathology - Toxicology
Professional Modules	- Advanced Health Informatics - Case Study/Problem Solving - Special topics in Biomedical Sciences - Advanced Immunology - Clinical Biochemistry - Medical Microbiology - Medical Parasitology

	• Research Methodology
	• Systemic Pathology & Cytology
	• Transfusion Science & Blood Banking
	• Advanced Hematology
	• Molecular Biology Techniques
	• Laboratory Science
	• Intellectual properties, Bioethics, Biosafety and Biosecurity
	• Laboratory Management
	• Final Year Research Project
Industrial Training	• Biomedical Practicum (Log Book is required)
	• Industrial Training (Log Book is required)
	Organisation profile
	Services available
	Medical Laboratory Diagnostic procedures
	MS/IEC ISO 15189 Procedures
	Rotation schedule
	-Sample reception, reports and databases
	-Hematology & Blood Bank
	-Biochemistry / Chemical Pathology
	-Histopathology & Cytology
	-Microbiology & Parasitology
	-Molecular diagnostic (optional)

2. Bachelor of Medical Laboratory Technology

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Anatomy & Physiology I - Anatomy & Physiology II - Biostatistics - Basic Biochemistry - Basic Genetics & Molecular Biology Techniques - Basic Microbiology - Basic Immunology & Serology Basic Pathology Basic Hematology - Basic Pharmacology & Toxicology - Introduction to Research Methodology
Professional Modules	- Laboratory Sciences - Laboratory Instrumentation - Clinical Biochemistry - Medical Microbiology - Medical Parasitology & Entomology - Clinical Hematology - Advanced Pathology - Cytopathology - Transfusion Science & Blood Banking - Advanced Hematology - Virology & Mycology - Genetic Diseases - Integrative Diagnosis - Special Topics in Biomedical Sciences* - Case Study/Problem Solving - Principles of Lab. Animal Sciences
Industrial Training	- Final Year Research Project - Introduction to Laboratory Management - MLT Practicum

3. Bachelor of Dietetics

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Anatomy and Physiology - Biochemistry /Clinical Biochemistry - Pathophysiology - Genetics - Microbiology/Food microbiology - Immunology - Pharmacology - Nutrition and Health - Nutrition in Lifecycle - Food Science / food analysis - Biostatistics/Epidemiology
Professional Modules	- Applied nutrition - Nutrigenomics - Community nutrition / Health promotion - Food Preparation - Assessment of Nutritional Status - Catering and Food Service Management - Behavioural Psychology - Food culture and nutrition - Nutrition Education and counselling - Medical Nutrition Therapy - Therapeutic Diet Preparation - Exercise Fitness and sports nutrition - Quality control and assurance - Research Methodology - Research Project
Industrial training (40 hours per credit)	- Clinical Placement (800 hours OR 20 credits); AND - Community Dietetics Placement (160 hours or 4 credits); AND - Food Service Placement (160 hours) = 4 credits

4. Bachelor of Environmental Health

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	• Human Anatomy and Physiology • Introduction to Environmental Health and Safety • Biochemistry • Environmental Microbiology and Parasitology • Epidemiology • Biostatistics • Research Methodology • Psychology and Behaviour
Professional Modules	• Applied Ecology • Diseases Related to Environment and Occupation • Disease Management and Control • Environmental Chemistry • Environmental and Industrial Toxicology • Water Supply and Quality Control • Food Hygiene and Safety • Vector and Pest Management • Solid Waste Management • Domestic and Industrial Wastewater Management • Toxic and Hazardous Waste Management • Outdoor and Indoor Air Quality • Environmental Measurement and Monitoring • Environmental Health Analytical Instrumentation • Environmental and Occupational Health Risk Assessment • Engineering Perspectives of Environmental and Occupational Health • Pollution Control Technology • Built Environment and Technology • Occupational Safety and Health • Industrial Hygiene • Ergonomics • Occupational Safety and Health Management • Emergency Response and Crisis Management • Environmental Health Promotion and Risk Communication

Component	Body of Knowledge		
	• Environmental Ethics		
	• International and Global Health		
	• Environmental and Occupational Noise Control		
	• Disease Mapping and Modelling		
	• Environmental and Occupational Health Legislation		
	• Environmental Management		
		o Environment Impact Assessment (EIA)and Auditing	
		o Environment Health Impact Assessment (EHIA)	
		o Chemical Health Risk Assessment (CHRA)	
		o Quality Assurance Management System	
	• Final Year Research Project		
Industrial training			
	Practical training (practicum log book is compulsory)		
	Private agency practicum (minimum of 10 weeks)	i. Introduction to organisational profile	
		ii. Framework of environmental and occupational safety and health management (EMS, OSHMS, HACCP, HIRARC, GMP, CHRA)	
		iii. Prevention, control and mitigation of accidents	
		iv. Industrial process and human resource management	
		v. Production process and services	
		vi. Emergency and contingency planning	
		1. Emergency and response	
		2. Control of industrial major accident and hazard (CIMAH)	
		vii. Industrial hygiene, safety and health monitoring	
		viii. Data management and analysis	
		ix. Health and safety audit	
		x. Toxic and hazardous waste management	
	Public agency (Ministry of	i. Investigation procedures	
		ii. Case management	

Component	Body of Knowledge	
	Health/Local Government) practical (minimum of 10 weeks)	iii. Prosecution and court procedures
		iv. Analysis of law cases
		v. Quality assurance and quality control
		vi. Management of international and global health
		a. International travellers
		b. Disease surveillance
		c. International health issues
		d. International food issues/crisis
		vii. Trans border health management
		viii. Food sampling and premise inspection
		ix. Vector control activities
		x. Water sampling activities
		xi. Disease control activities
		xii. Occupational safety and health activities
		xiii. Health risk assessment of water sources
		xiv. Waste management
		xv. Inspection of public facilities (hotel, market, food court, theatre, amusement park etc.)
		xvi. Nuisance investigation and abatement
		xvii. Urban health management (Local Agenda 21, healthy setting)
		xviii. Environmental disaster management

Below are the body of knowledge for combination of **Environmental, Occupational Health and Safety**:

Bachelor of Environmental, Occupational Health and Safety

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	• Human Anatomy and Physiology • Chemistry • Microbiology • Epidemiology • Biostatistics • Psychology and Behaviour • Physics • Laboratory and Analytical Sciences

Professional Modules	• Principles in Environmental, Occupational Health and Safety
	• Research Methodology
	• Risk Assessment and Management
	  ○ HIRARC
	  ○ EHIA (Environmental Health Impact Assessment)
	  ○ CHRA
	• Vector and Pest Management
	• Water Supply and Quality Control
	• Food Hygiene and Safety
	• Solid Waste Management
	• Wastewater Management
	• Toxic and Hazardous Waste Management
	• Environmental Measurement and Monitoring
	• Environmental Management
	• Outdoor and Indoor Air Quality
	• Laws Related to Occupational Safety and Health (OSH) and Environment Health
	• Pollution Control Technology
	• Environmental and Occupational Audit
	• Emergency Response and Planning
	• Fire Safety
	• Chemical Safety

Component	Body of Knowledge
	- Machinery Safety - Construction Safety - Electrical Safety - Confined Space - Environmental and Industrial Toxicology - Ergonomics and Human Factor - Industrial Hygiene - Diseases Related to Environment and Occupation - Health, Safety and Environment Promotion Fitness to Work and Rehabilitation - Personal Protective Equipment - Accident Investigation

Industrial training	**Practical Training (practicum log book is compulsory)**
	
	i. Introduction to organisational profile
	
	ii. Framework of environmental, occupational safety and health management (EMS, OSHMS, HACCP, HIRARC, GMP, CHRA)
	
	iii. Prevention control and mitigation of accidents
	
	iv. Industrial process and human resource management
	
	v. Emergency and contingency planning
	  a) Emergency and response
	  b) Control of industrial major accident and hazard (CIMAH)
	
	vi. Industrial hygiene, safety and health monitoring
	
	vii. Health and safety audit
	
	viii. Toxic and hazardous waste management
	
	ix. Investigation procedures
	
	x. Return to work assessment
	
	xi. Fitness to work assessment
	
	xii. Prosecution and court procedures
	
	xiii. Analysis of law cases
	
	xiv. Quality assurance and quality control
	
	xv. Management of international and global health
	  a. International travellers
	  b. Disease surveillance

Component	Body of Knowledge
	c. International health issues
	d. International food issues/ crisis
	e. Trans border health management
	xvi. Food sampling and premise inspection
	xvii. Vector control activities
	xviii. Water sampling activities
	xix. Disease control activities
	xx. Occupational safety and health activities
	xxi. Health risk assessment
	xxii. Waste management
	xxiii. Inspection of public facilities (hotel, market, food court, theatre, amusement park etc.)
	xxiv. Nuisance investigation and abatement
	xxv. Urban health management (Local Agenda

5. Bachelor of Health Care Management

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Human Anatomy and Physiology - Principles of Health Care and Disease Prev ention - Introduction to Psychology - Terminology in Health Care Management
Professional Modules	- Principles of Accounting - Principles of Management and its Application in Health Care Services Management - Organisational Behaviour - Principles to Health Care System, Service and Management - Medical and Bio Ethic - Principles of Health Finance and Economy - Health Care Programme Planning and Evaluation - Organisational Development and Transformation - Emergency and Disaster Management - Health Education and Promotion - Health Care System – Rural/Urban, Private / Public - Health Safety and Risk Management - Human Resource, and its Application in Hospital & Health Care Management - Leadership & Conflict Resolution in Health Care Institutions - Planning, Designing and Management of Clinical Services Departments – Wards Units, Opds, ICU, A & E, OT* - Supportive Services – Laboratory, CSSD, Dietary, Linen &Laundry, Utility – Sanitation & Hospital Waste Disposal * - Quality Management & Hospital Accreditation System - National Health Policy - Communication Skills - Socio-Cultural Aspect of Health and Health Care - Epidemiology - Health care system research methodology - Biostatistics - Health Informatics and Health Information Management (Record Management, Medical Coding)

	• Industrial Training**
Industrial training	*A health management professional is an individual who provides administrative/ management support for the delivery of healthcare services. Therefore, the students will not involve directly in clinical aspects and they do not have direct contact with the patients. The main employers are hospitals, nursing care and residential care facilities and doctors' offices. Industrial training supervision doesn't require specific preceptors*

* *exposure to the real practices such as industrial visits*

6. Bachelor of Medical Imaging

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Human Anatomy and Physiology - General Physics - General Pathology - Systemic Pathology - Radiation Biology and Safety - Basic Human Psychology - Basic Pharmacology - Biostatistics
Professional Modules	- Patient Care in Medical Imaging - Medical Imaging Instrumentation - Medical Imaging Procedures - Specialized Medical Imaging Procedures - Conventional and digital Image Processing - Radiographic Anatomy - Image Evaluation - Radiographic Pathology - Sectional Anatomy - Comparative Imaging - Evidence Based Practice in Medical Imaging - Cardiovascular Imaging Computed Tomography (Physics, Instrumentation & Technique) - Magnetic Resonance Imaging (Physics, Instrumentation & Technique) - Ultrasonography (Physics, Instrumentation & Technique) - Radionuclide Imaging (Physics, Instrumentation & Technique) - Breasts Imaging - Oral Maxilofacial Imaging - Bone densitometry - Forensic radiography - Hybrid modality - Professionalism and Ethics in Radiography/medical Imaging

Component	Body of Knowledge	
	• Fundamental in Management	
	• Quality Assurance in Medical Imaging	
	• Research Methodology	
	• Research Project	
	• Healthcare Information System	

Industrial Training	Modules	Description
	Clinical I (Radiography)	• Chest and upper airways
		• Abdomen
		• Shoulder girdle
		• Pelvic girdle
		• Upper and lower extremities
		• Bony thorax
		• Vertebral column
	Clinical II (Radiography and contrast study)	• Urinary system
		• Digestive system
		• Biliary system
		• Skull
		• Facial bones
		• The use of contrast media for radiographic procedures
	Clinical III	• Mammography
		• Hysterosalpingography
		• Pediatric radiography
		• Geriatric radiography
		• Operating theatres
		• Mobile radiography
		• Forensic radiography
	Clinical IV	• Trauma/accident
		• Computed Tomography
		• General Angiography
		• The use of contrast media for radiographic procedures.

Component	Body of Knowledge	
	Clinical V	• Breasts Imaging • Ultrasound • Catheterization Procedures • Maxillofacial and Dental Imaging • Bone Densitometry
	Clinical VI	• MRI • Computed Tomography • Radionuclide Imaging • Hybrid Modalities • General radiography • Operating theatres • Mobile radiography

7. Bachelor of Nutrition

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Anatomy and Physiology - Basic Pathology - Pharmacology - Immunology/Nutritional Immunology - Nutrition and Genetics - Biochemistry - Nutrition and Health - Nutrition in Lifecycle - Food Science - Developmental Psychology - Food Microbiology - Biostatistics/Epidemiology
Professional Modules	- Principles of food preparation - Food Analysis - Assessment of Nutritional Status - Nutrition Education/Promotion - Catering and Food Service Management - Nutrition Programme Planning and Assessment - Community Nutrition Project - Nutrition Policy and Food Security - Nutrition for Sports and Physical Activity - Techniques in Nutrition Research/Research Methodology - Advanced Nutrition - Health care Management - Medical Nutrition Therapy/Diet and Chronic Diseases - Nutritional Anthropology - Research in Nutrition/Nutrition Research - Seminar - Scientific Communication - Communication Skills - Special Topics in Nutrition - Behavior and Health

Component	Body of Knowledge
Industrial Training	Industrial training/placement (720 hours)
	Community placement, nutrition education and promotion placement in the community and within the university (280 hours)

8. Bachelor of Occupational Safety and Health

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	• Human Anatomy and Physiology • Chemistry • psychology • Microbiology • Physics • Biostatistics • Laboratory Sciences
Professional Modules	• Principles in Occupational Safety and Health • Occupational Safety and Health Laws • Occupational Injury and Disease Compensation • OSH Management System • OSH Risk Management • Emergency Response and Planning • Hazardous Substances • OSH Communication • Fire Safety • Chemical safety • Machinery Safety • Industrial Toxicology • Occupational Epidemiology • Ergonomics and Human Factor • Industrial Hygiene • OSH Services • Occupational Diseases • Behavioural Based Safety • OSH Promotion • Business Operations Management • Personal Protective Equipment • Rehabilitation and Fitness -to-Work • Organizational Leadership • OSH Audit • OSH Surveillance and Monitoring

Component	Body of Knowledge
	• **Accident Investigation**
	• Indoor air quality monitoring
	• Chemical health risk assessment
	• Research Methodology
	• Research project
Industrial Training	Industrial Training (with log book)
	• Legal Requirement
	• OSH Management System
	• Conduct HIRARC and produce reports
	• Conduct CHRA and produce reports
	• Investigate OSH issues and produce report
	• Emergency response system report

9. Bachelor of Occupational Therapy

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Behavioral science - Anatomy - Physiology - Neuroscience - Biomechanics / kinesiology - Medical - Orthopaedic and Surgical - Neurology - Mental health - Gerontology - Ergonomic - Basic Pathology - Pharmacology - System Pathology - Neuropsychology and health psychology - Biostatistics and research methodology - Basic Patient Care Skill
Professional Modules	- Foundation in Occupational therapy - Professional development - Occupational therapy assessment (physical*) - Occupational therapy assessment (psychosocial) - Occupational therapy assessment (paediatric) - Occupational therapy Intervention (physical) - Occupational therapy Intervention (psychosocial) - Occupational therapy Intervention (paediatric) - Occupational therapy application (physical) - Occupational therapy application (psychosocial) - Occupational therapy application (paediatric) - Occupational therapy in Work and Education - Occupational therapy in Community - Research project

Industrial training	• Occupational therapy practice (physical, psychosocial, paediatric)
	• Occupational therapy practice in at least ONE special area (eg. special school, NGOs, nursing home, work rehabilitation centre) (**) & (***)

1. *Physical consist of medical, orthopaedic, neuro, surgical, geriatric.
2. ** Should be at least 2 credits.
3. *** Refer Clinical Training Guideline

CLINICAL TRAINING GUIDELINE (***)

All knowledge, skill and attitude learned are integrated via graded clinical exposure in the following various context of professional practice:

No	OT Competencies	The person-occupation environment relationship and its relationship to health	Therapeutic and professional relationship	An occupational therapy process	Professional reasoning and behavior	The context of professional practice
	PERFORMANCE CRITERIA	1) Philosophies Theories & Principles 2) OT Models & Frame Of References for Occupational Participation 3) Standard Procedures & Safety	1) Community Participation/ engagement/ networking 2) Code Of Ethics 3) Effective Communication &Teamwork 4) Interpersonal skill, social skill & managerial skill	1) Philosophies 2) Theories & Principles 3) OT Models & Frame Of References for Occupational Participation 4) Standard Procedures & Safety 5) Problem Solving & Evident Based Practice	1) Code Of Ethics 2) Problem Solving&Evident Based Practice 3) Research methodologies & Information management 4) Effort for continuing competence 5) QualityService& entrepreneurial skill	Integration of all performance criteria for developing clinical competencies

		DIMENSION OF CLINICAL COMPETENCIES				
1	Task Skill	Select and use ass & tx technique/ procedures for ethical, safety and effective practice	Assist in managing cases	Demonstrate procedures of Isolated Assessment & Treatment technique	Follow through scientific procedures and principles of isolated techniques	Introduction Physical & Psychosocial aspect
2	Task Management Skill	Justify and defend the application of theory and philosophy of OT to enabling occupation	Works Independently manage cases	Demonstrate procedures of Assessment, Planning and Treatment	Follow through scientific procedures and principles of OT Process	Managing Physical & Psychosocial aspect
3	Contingency management skills	Evaluate the effectiveness of tx outcome to enabling occupation	Assume Teamwork/ Collaboration	Demonstrate complete Assessment, Planning and Treatment and Evaluation Process	Adapt/ adjust behavior to suit changes	Managing Physical, Psychosocial and Pediatric aspect
4	Job role/ environment skills	Plan for modification/ Changes to enabling occupation	Participate in Managerial responsibility	Effectively and efficiently demonstrate complete OT process in various context	Uses research skills to arrange/ Create/ formulate action to solve issues	Dept Management Effectively and efficiently complete OT Process

10. Bachelor in Paramedical Science

Component	Body of knowledge
Fundamental Modules including Basic Sciences	• Human Anatomy/Functional & Applied Anatomy • Human Physiology • Pathology • Pharmacology • Biochemistry • Microbiology
Professional Modules	• Personality & Professional development • Behavioural Science/Psychology • Psychiatry • Surgical • Orthopaedic • Paediatric • O&G • Medical • Community Health (Primary Health Care) • Public Health • Emergency Medicine • Disaster Medicine • Pre-Hospital Care
Industrial / Clinical Training	• Prehospital Care • Emergency Medicine • Emergency Medical Dispatch • Orthopaedic & Sports Medicine • Surgery • Labour room • Paediatric • Anaesthesia & Critical Care • Primary Health Care • Psychiatry • Disaster Medicine

11. Bachelor of Physiotherapy

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Human Anatomy / Functional and Applied Anatomy - Human Physiology - Behavioral Science - Pathology - Kinesiology - Biomechanics - Pharmacology - Research methodology - Biostatistics - Exercise Physiology - Neuroscience
Professional Modules	- Professional development - Movement, handling & exercises - Electro-physical agents - Physiotherapeutic Skills - Physiotherapy in Musculoskeletal - Physiotherapy in Cardiorespiratory - Physiotherapy in Neurology - Physiotherapy in Geriatric - Physiotherapy in Paediatric - Physiotherapy in Sports - Physiotherapy in Women's Health - Physiotherapy in Occupational Health - Clinical Reasoning - Research Project / Dissertation - Evidence Based Practice
Industrial training	- Musculoskeletal, Cardiorespiratory, Neurology - Client specific: Paediatrics, sports, Women's Health, Geriatric, Occupational Heath - Primary care, outpatient and inpatient,
	Elective Placement Disable Children Homes, Sport Clubs, Nursing Homes, Elderly Homes, Spastic Children, Special Need Schools, Hospices

12. Bachelor of Radiation Therapy

Component	Body of Knowledge
Fundamental Modules include Basic Sciences	- Human Anatomy and Physiology - General Physics - Radiation Physics and Radiation Protection - General Pathology - Systemic Pathology - Basic Human Psychology - Biostatics - Pharmacology
Professional Modules	- Patient Care in Radiation Therapy - Radiation Therapy Instrumentation (I and II) - Radiation Therapy Planning and Delivery (I, II, III and IV) - Radiation Therapy Physics - Imaging Procedures in Radiation Therapy - Sectional Anatomy - Advanced Radiation Therapy Techniques - Brachytherapy - Professionalism and Ethics in Radiation Therapy - Radiobiology - Oncology (I and II) - Quality Assurance in Radiation Therapy - Research Methodology - Research Project - Management
Industrial Training	Radiation Therapy Practice (I, II, III, IV and V) <table><tr><td>**Modules**</td><td>**Description**</td></tr><tr><td>Radiation Therapy Practice I</td><td>This module aims to provide the student with an introduction to clinical experience. The student is expected to gain experience and confidence in communication with patients and set the patients up for simulation and radiation treatment, under the close supervision of a clinical supervisor.</td></tr></table>

	Radiation Therapy Practice II	This module aims to help the student to develop the understanding required to be able to undertake radiation therapy treatment planning and set-up which are tailored to meet the needs of individual patients.
	Radiation Therapy Practice III	The student will be expected to support the work of other team members, and demonstrate understanding of the role of various external beam procedures. The student will be expected to be able to recognise when a treatment varies from the usual departmental routine, show initiative in determining the reasons and the possible variations required to provide the best management of diseases.
	Radiation Therapy Practice IV	The main emphasis of this module is to complete the range of clinical experience on various radiation therapy modalities. The student should develop, consolidate and be able to evaluate the previously acquired skills in treatment planning and set-up procedures so that they can function independently as a junior staff member upon graduation.
	Radiation Therapy Practice V	The main emphasis of this module is to complete and strengthen the skills of the students on the whole range of clinical experience on various radiation therapy modalities and to appreciate the various aspects of quality assurance in radiation therapy.

13. Bachelor of Speech Sciences / Speech-language Pathology

Component	Module	Total	Theory	Practical	Clinical
Compulsory Module (10-15%)	Knowledge Scope: 1. Country Needs – Malay Language, Malaysian Study, Islamic/ Moral Study 2. University Needs – Option of Social Science/Humanity, Co-curriculum 3. Self-Development - Language, Communication Skills	15	0	0	0
		15	**15**	**0**	**0**
Fundamental Module (15-25%)	Human Structure and Function	3	3	0	0
	Psychology • Developmental Psychology • Abnormal Psychology	5	5	0	0
	Language Development	3	3	0	0
	Language and Cognition • Neurolinguistics • Neuropsychology • Psycholinguistics	2	2	0	0
	Basic Linguistics	2	2	0	0
	Applied Linguistics • Sociolinguistics • Multilingualism and Colloquial Language • Dialects	3	3	0	0
	Research Statistics • Biostatistics • Research Methodology	6	4	2	0
		24	**22**	**2**	**0**
Professional Module (40-50%)	Anatomy and Physiology for Speech and Hearing	3	3	0	0
	Medical Bases for Communication Disorders • Neurology (Neurology for Speech) • Otolaryngology (Otology) • Paediatric (Paediatric for Speech) • Geriatric	4	4	0	0
	Acoustics and Phonetics	3	2	1	0
	Clinical Linguistics	2	1	1	0
	Clinical Orientation	3	2	1	0
	Introduction to Communication Disorders	2	2	0	0
	Childhood Language Disorders	3	2.5	0.5	0

	Adult Language Disorders	3	2.5	0.5	0
	Speech Sound Disorders • Articulation and Phonological Disorders • Childhood Apraxia of Speech • Developmental Dysarthria	3	2.5	0.5	0
	Resonance Disorders	2	1.5	0.5	0
	Motor Speech Disorders	2	1.5	0.5	0
	Fluency Disorders	2	1.5	0.5	0
	Voice Disorders • Dysphonia • Alaryngeal Speech	3	2.5	0.5	0
	Feeding and Swallowing Disorders	3	2.5	0.5	0
	Aural Rehabilitation	3	2.5	0.5	0
	Alternative and Augmentative Communication	2	1	1	0
	Professional Issues	2	2	0	0
	Basic Audiology Techniques for Speech Sciences	2	1	1	0
	Learning Processes and Special Needs	2	2	0	0
	Counselling for Communication Disorders	2	1.5	0.5	0
	Research Project	6	0	6	0
		57	**41**	**16**	**0**
Clinical Module (15-25%)	Clinical Practicum	22	0	0	22
	Supervised Professional Placement (Industrial Training) (1 month)	4	0	0	4
		26	**0**	**0**	**26**
Elective Module (4-8%)	Elective Courses (Modules)	6	6	0	0
		6	**6**	**0**	**0**
	Total Credits	**128**	**84**	**18**	**26**

APPENDIX 3: RESOURCES SPECIFIC TO THE FIELD OF STUDY

This section contains the resources specific to the fields of study which are essential that will enhance effective teaching and learning. The information is displayed in a non-standardised manner to capture the demand and essence of the individual subgroup.

1. MEDICAL LABORATORY TECHNOLOGY

The table contains the benchmarked resources estimate based on 50 students per intake.

No.	Items	Minimum Unit
1.	Autoclave (Mid range)	1
2.	Automatic pipette (adjustable volumes)	5 of each
	Pipette - fixed volume (various volume)	5 of each
3.	Bench top centrifuge	1
4.	Blood mixer/rotator	2
5.	Blood pressure monitor	5
6.	Bunsen burner	25
7.	Spectrophotometer	2
8.	Deep freezer	2
9.	Electrophoresis system	2
10.	Electronic balance	2
11.	Hazardous chemical cabinet	2
12.	Immunohematology gel card system (Semi-auto)	2
13.	Incubator	2
14.	Laminar flow hood (Clean bench)	1
15.	Microhematocrit centrifuge	2
16.	Microtome rotary	2
17.	Microfuge/serofuge	2
18.	Microscope (student)	30
19.	Oven (Hot air)	2
20.	Platform shaker	1
21.	Safety cabinet	1
22.	Slide warmer	1
23.	Float bath	1
24.	Stethoscope	5
25.	Refrigerated centrifuge	1
26.	Refrigerator	2

No.	Items	Minimum Unit
27.	pH meter	2
28.	Fume cupboard	1
29.	Hotplate/stirrer	3
30.	Vortex mixer	2
31.	Water distiller	2
32.	Water bath	1
33.	Water deioniser	1
34.	Safety goggles/glasses	25
35.	Timers	10
36.	Power Lab plus accessories	10
37.	Freeze dryer	1
38.	Organ bath	2
39.	Treadmill	1
40.	Snellen chart	1
41.	Ishihara chart	1
42.	Tuning fork	2
43.	Hot plate	2
44.	Sonicator	2
45.	Dissecting set	10
46.	Animal restrainer (rat)	2
47.	TV	1
48.	Animal cages (rats and mice)	10
49.	Dissecting board	10
50.	Animal rotary	2
51.	First aid box	1
52.	Shaver	1
53.	Punch-biopsy tool	1
54.	Tissue culture media / chamber	1
55.	Top pan balance	2
56.	UV-Visible spectrophotometer	1
57.	Video microscope	1
58.	Network computer	5
59.	Water Purification System (Ultra pure)	1
60.	Growth media for microbe	1

No.	Items	Minimum Unit
61.	ELISA	1
62.	Thermal cycler (PCR)	1
63.	Gel Electrophoresis	1
64.	Gel Documentation	1
65.	Stereomicroscope	1
66.	Microscope-dissecting	1
67.	Microwave oven	1
68.	Gas chromatograph	1
69.	Analytical balance (High end)	1

ADVANCED ANALYTICAL LABORATORY - (STRONGLY RECOMMENDED) (Biomedical Science)

No.	Items	Total Unit
1.	Chemistry analyser system	1
2.	Immunoassay system	1
3.	Atomic absorption meter (AA)	1
4.	Comparison microscope with closed circuit TV	1
5.	Fourier transform infrared (FITR)	1
6.	High performance liquid chromatograph	1
7.	High speed centrifuge	1
8.	Solid phase extractor apparatus	1
9.	Thin layer chromatograph	1
10.	Sequencer	1
11.	Hybridizer	1
12.	Flowcytometer	1
13.	Metabolic Cages	2
14.	Spirometer	1
15.	Mass Spectrometry	1

SMALL & MISCELLANEOUS ITEMS (Adequate quantities for each practical session)

No.	Items
1.	Alcohol burner
2.	Autoclavable carboys
3.	Autoclavable pipette filler
4.	Autoclaving basket
5.	Bag Sealer
6.	Balance
7.	Basin
8.	Beaker
9.	Biohazard bags
10.	Biohazard container
11.	Biohazard - Sharps container
12.	Bottle - aspirator with spigot
13.	Bottle - wash (polythene)
14.	Bunsen burner
15.	Biuret set
16.	Callipers
17.	Counter - Hand tally
18.	Counter - Laboratory counter
19.	Face shields (Chemical)
20.	Face shields (UV-absorbing)
21.	Flask – Conical/Erlenmeyer
22.	Flask - Filtering (Small)
23.	Flask – volumetric (100ml – 1 litre)
24.	Forceps
25.	Laboratory Blenders
26.	Funnel - Analytical 30mm diameter
27.	Goggles (Chemical resistant)
28.	Goggles (UV-absorbing)
29.	Hair Dryers
30.	Hemocytometer set
31.	Holder - test tube
32.	Holder - wire loop
33.	Jar – Desiccator

No.	Items
34.	Kettle – Electric
35.	Measuring cylinder (100ml – 1 litre)
36.	Micro centrifuge tube racks
37.	Mixer – Hand
38.	Pasteur Pipette Containers/Cans
39.	Pipette
40.	Pipette - Micropipette adjustable volume
41.	Pipette - Micropipette fixed volume
42.	Pump – Aspirator
43.	Rack - Sample storage cup
44.	Rack - Test tube
45.	Reader - Microhematocrit tube
46.	Refractometer
47.	Safety bottle carriers
48.	Scalpel handle
49.	Scissors
50.	Slide – Microscope
51.	Spatula
52.	Retort Stand
53.	Table lamps for laboratory use
54.	Thermometer
55.	Timer - Stop watch
56.	Tube - centrifuge

TEACHING AIDS - (ANATOMICAL MODELS)

(Clinical Biochemistry/Microbiology/Biomedical Science/Genetics) - (Minimum of 2 units for each practical session)

No.	Items		
1.	Arm skeleton	31.	Lung, heart & diaphragm
2.	Artery and vein model (Enlarged)	32.	Male muscles figure
3.	Corpuscles of kidney	33.	Male reproductive system
4.	Digestive tract	34.	Muscles of the arm model
5.	Ear (Enlarged)	35.	Muscles of the hand model
6.	Ear Model (Functional)	36.	Nephron (Enlarged)
7.	Elbow Joint (Functional)	37.	Ovary (Enlarged)
8.	Embryo (Human)	38.	Pancreas, spleen & duodenum
9.	Eye (Enlarged)	39.	Pelvic skeleton (Male)
10.	Eyeball with part of orbit.	40.	Pelvic skeleton (Female)
11.	Female genital organ	41.	Pelvic skeleton with ligaments
12.	Female pelvis with ligaments.	42.	Physiology laboratory systems (Computerised)
13.	Female pelvis with pelvic floor	43.	Shoulder joint
14.	Female reproductive system	44.	Skeleton (Half human)
15.	Foot and ankle	45.	Skeleton (Human) c/w stand
16.	Hand showing muscles	46.	Skin (Bisected)
17.	Head and neck	47.	Skull (Human) - Adult
18.	Head and neck with muscles	48.	Skull (Human) - Baby
19.	Head with brain (Base)	49.	Spinal cord (Section of)
20.	Heart (Life form)	50.	Stomach (Entire anatomy)
21.	Hip joint	51.	Teeth - Complete Set
22.	Kidney (Dissected)	52.	Teeth (Enlarged)
23.	Knee joint (Flexible)	53.	Thorax with diaphragm

No.	Items		
24.	Larynx (Enlarged)	54.	Tongue showing muscles
25.	Larynx, trachea & bronchus	55.	Torso with head
26.	Leg showing muscles	56.	Urinary organ
27.	Leg skeleton	57.	Vertebrae column with pelvis
28.	Liver & gall bladder	58.	Histology and Histopathology teaching slides
29.	Lung lobule and alveolus set	59.	Cytology teaching slides

TEACHING AIDS - (ANATOMICAL CHARTS)

(Clinical Biochemistry/Biomedical Science) - (Minimum of 2 units for each practical session)

No.	Items
1.	Circulatory system
2.	Digestive system
3.	Human skeleton
4.	Human musculature
5.	Nervous system
6.	Reproductive system
7.	Respiratory system
8.	Urinary system

2. DIETETICS

i. Food Preparation Laboratory

No.	Items	Benchmarked (B)/ Enhanced (E)
1.	Measuring equipment	B
2.	Slicing and Cutting Tools	B
3.	Mixing tools	B
4.	Baking equipment	B
5.	Cooking tools and cookware	B
6.	Kitchen aids	B
7.	Cutlery and serving dishes	B
8.	Cleaning equipment	B
9.	Storage facility	B
10.	Fridge & Freezer	B
11.	Table top with sink	B
12.	Oven / stove / microwave	B
13.	Basic cooking ingredients	B
14.	Waste disposal system	B

ii. Nutrition Assessment Laboratory

No.	Items	Benchmarked (B)/ Enhanced (E)
1.	Computers - connected to network system	B
2.	Dietary Analysis software	B
3.	Statistical analysis software	B
4.	Anthropometric equipments	
	• Stadiometer	B
	• recumbent length board	B
	• weight, height scale with precision	B
	• infant weighing scale	B
	• infantometer	B
	• skinfold calipers	B
	• wheel-chair weight measurement	E
	• Hand-grip dynamometer	E
5.	Food models & measuring utensils	B

No.	Items	Benchmarked (B)/ Enhanced (E)
6.	Bioelectrical Impedance Analyser	E
7.	Sphygmomanometer	E
8.	Hemocues, portable hemoglobin photometers	E
9.	Indirect Calorimetry	E
10.	Biochemical Test Kits for blood and urine	E

iii. Food Science Laboratory

No.	Items	Benchmarked (B)/ Enhanced (E)
1.	Universal Oven (105°C) for moisture determination	B
2.	Furnace (600°C) for ash determination	B
3.	Kjeldahl System for crude protein determination	B
4.	Soxhlet System for crude fat determination	B
5.	Fiber determination system	B
6.	Determination System	B
7.	Electronic Balances	B
8.	Water Baths	B
9.	Light meter	B
10.	pH Apparatus	B
11.	Rotary Evaporator	B
12.	UV/VIS Spectrophotometer	B
13.	Calorimeter	E
14.	High Performance Liquid Chromatograph	E
15.	Gas Chromatograph	E
16.	Atomic Absorption Spectroscopy	E
17.	Water Activity Meter	E
18.	Viscometer	E
19.	Food Testing Instrument	E
20.	Lab Mills	E
21.	Melting Point Apparatus	E
22.	Refractometer	E

3. ENVIRONMENTAL HEALTH

Generic requirement for programmes within this sub-group are:

a. Basic facilities

Basic Generic Facilities include classroom suited for teaching and learning, in buildings, with CF (Certification of Fitness to stay) appropriate to the Uniform Building By-Laws, in particular sections related to School Premises; with proper BOMBA certification. Space should be sufficient to the number of students taken in. Premises must be well-furnished with appropriate fittings, furniture and equipment which are safe, according to health standards and well-maintained.

In addition there will be resources relating to physical resources such classrooms and computer labs. Library books and reference material are also part of the resources dedicated to the program. All health care management programs must refer to Private Healthcare Facilities and Services Act 1998

b. Laboratories and other facilities

Labs should be sufficient to meet the training needs of the students:
a. Basic science lab
b. Chemistry and toxicology labs
c. Environmental Health and Science laboratory

Most of the laboratory work can be conducted in groups.

c. Placement in various related premises and centres
a. Access to clinical set-ups such as – wards, clinics, clinical laboratories, radiology and imaging facilities.
b. Access to water catchment areas, water treatment facilities, sewage treatment facilities and garbage disposals facilities system including scheduled waste treatment and disposals.
c. Access to multiple industries and plants.
d. Access to multiple related government agencies.

CRITERIA FOR SELECTION OF PLACEMENT CENTRES
a. Detail of the registered enterprise or professional practitioner
- name
- registration number
- address

- working experience
- current APC and PNC
- qualification/CV
- continuous professional development (CPD) record
- disciplinary record

b. Type of services offered

- Primary Care
- Specialty Care – occupational or environmental health services.

c. Operation hours

Workload (sufficient workload to benefit trainees, but not too much as for productivity to be affected by the students presence); would continuously accept students for placement; valid Business Registration or related accreditation.

Specific Requirements

The proposed list of equipment is equivalent for 20 students. The institutions must take necessary steps to ensure that the equipment is sufficient enough and up to date with the progress of the profession.

NO.	EQUIPMENT
1	Microscope for Insects/larvae identification
2	Water sampling kit (pH, turbidity, chlorine and color)
3	Food sampling kit (solid, semi-solid and liquid)
4	Sound level meter
5	Lux meter
6	Air sampling equipment (Hi-volume sampler, gas sampler, personal sampling pumps)
7	Fumigation kit (using cyanide and methyl bromide)
8	Enforcement activity kit (closure of food or unsanitary premises under the Food Act 1983)
9	Model of pests (Order anoplura; sucking lice, Order hemiptera, Acarology, Suborder - ticks, chiggers, mites and rodent etc.)
10	Outbreak investigation kit (food and waterborne diseases, sexually transmitted diseases, vector borne, airborne and immunizable diseases).

11	Disinfection kit (concurrent, terminal)
12	Residual spraying kit
13	Fogging equipments (thermal, aerosol)
14	Entomological survey equipment (adult and larvae: mosquito and housefly)
15	Cleaning and sanitizing and their agents
16	Food packaging material (compatibility, requirement, safety, labeling requirements of food packages)
17	Model for solid waste disposal in the rural and urban areas (storage, collection and transportation and final disposal site)
18	Sampling, testing and analysis kit of sewage for effluent standard
19	Mock court (preparing and conduct of mock trial, preparing investigation paper and investigation files, affidavit, complaint to magistrate, summon and charge sheets, fact of case)
20	Plumbing and sanitary fittings

Note: Please ensure that all chemicals used must be accompanied with MSDS/CSDS.

4. MEDICAL IMAGING

No.	Modules	Ratio	Benchmarked (B) /Enhanced (E)
1	Human Anatomy & Physiology (1 &11) Standard anatomy & physiology models, phantoms/ mannequin , apparatus and teaching aids for theory and demonstration session	1:20	B
2.	General Physics Basic experimental model/apparatus for laboratory sessions	1:20	B
3.	General Pathology - Anatomical models, charts and posters for teaching aids	1:20	E
4.	Radiation Physics (including radiation protection) Basic experimental apparatus and radiation protection accessories/lead gowns for laboratory sessions	1:20	B
5.	Patient Care in Radiography For Basic Nursing care procedures to be equipped with: - bed, mattress, pillow, linen, - bed-pan & urinal, - thermometer – conventional & digital Set of Sphygmomanometer, - CPR phantom/mannequin – adult & baby - Emergency trolley, - Wheelchair, - Patient trolley, transfer board and other relevant apparatus.	1:20	B
6.	Radiographic equipment and accessories for radiographic technique: - X-ray equipment with x-ray table and/erect bucky - Screen/films/cassette of various sizes - X-ray accessories – lead gown / apron, immobilisation devices, cassette holder etc.	1:20	B

No.	Modules	Ratio	Benchmarked (B) /Enhanced (E)
	• Radiographic phantoms/mannequin with various models Image Processing Equipment: • Dark room with automatic processor in a specific darkroom layout • Illuminators • Integrated Computed Radiography System / Digital Radiography With Image Reader & Monitor Console/Workstation • Imaging Plate For Computed Radiography System (CR)		
7.	Radiographic Anatomy Image Analysis Sectional Anatomy • Sectional anatomical models/ cadaver slices • Radiographic images • Computer terminals • Illuminators	1:10	B
8.	Quality Assurance in Radiography/Medical Imaging *Sets of QA tools for Processing and radiographic equipment*	1: 10	B

Additional equipment for degree program

No.	Modules	Ratio	Benchmarked (B) /Enhanced (E)
1	Ultrasound machine and accessories	1:20	B
2	Mammography machine and accessories	1:20	B

CRITERIA FOR SELECTION OF CLINICAL PLACEMENTS

The Imaging department in hospitals chosen for clinical placements should have:

a. At least two General X-ray rooms; for general radiography and one Special/Contrast Examination room.

b. Larger hospitals for other special Imaging Modalities, such as Angiography, CT, MRI, US and RNI.

c. Workload (at least 30 patients/per day during their clinical placements).

5. NUTRITION

i. Food Preparation Laboratory

No.	Items	Benchmarked (B)/ Enhanced (E)
1.	Measuring equipment	B
2.	Slicing and Cutting Tools	B
3.	Mixing tools	B
4.	Baking equipment	B
5.	Cooking tools and cookware	B
6.	Kitchen aids	B
7.	Cutlery and serving dishes	B
8.	Cleaning equipment	B
9.	Storage facility	B
10.	Fridge & Freezer	B
11.	Table top with sink	B
12.	Oven / stove / microwave	B
13.	Basic cooking ingredients	B
14.	Waste disposal system	B

ii. Nutrition Assessment Laboratory

No.	Items	Benchmarked (B)/ Enhanced (E)
1.	Computers - connected to network system	B
2.	Dietary Analysis software	B
	• Dietary Analysis Apps	E
3.	Statistical analysis software	B
4.	Anthropometric equipments	
	• Stadiometer	B
	• recumbent length board	B
	• weight, height scale with precision	B
	• infant weighing scale	B
	• infantometer	B
	• skinfold calipers	B
	• wheel-chair weight measurement	B
	• Hand-grip dynamometer	B

	• Accelerometer	E
	• Pedometer	E
	• Physical activity Apps	E
5.	Food models & measuring utensils	B
6.	Bioelectrical Impedance Analyse	B
7.	Electronic portable BP set	B
8.	Hemocues, portable haemoglobin photometers	B
9.	Indirect Calorimetry	E
10.	Biochemical Test Kits for blood and urine	B

iii. Food Science Laboratory

No.	Items	Benchmarked (B)/ Enhanced (E)
1.	Universal Oven (105°C) for moisture determination	B
2.	Furnace (600°C) for ash determination	B
3.	Kjeldahl System for crude protein determination	B
4.	Soxhlet System for crude fat determination	B
5.	Fiber determination system	B
6.	Determination System	B
7.	Electronic Balances	B
8.	Water Baths	B
9.	Light meter	B
10.	pH Apparatus	B
11.	Rotary Evaporator	B
12.	UV/VIS Spectrophotometer	B
13.	Calorimeter	B
14.	High Performance Liquid Chromatograph	B
15.	Gas Chromatograph	B
16.	Atomic Absorption Spectroscopy	B
17.	Water Activity Meter	B
18.	Viscometer	B
19.	Food Testing Instrument	B
20.	Lab Mills	B
21.	Melting Point Apparatus	B
22.	Refractometer	B

6. OCCUPATIONAL SAFETY AND HEALTH (OSH)

Generic requirement for programmes within this sub-group are:

a. Basic facilities

Basic Generic Facilities include classroom suited for teaching and learning, in buildings, with CF (Certification of Fitness to Stay) appropriate to the Uniform Building By-Laws, in particular sections related to School Premises; with proper BOMBA certification. Space should be sufficient to the number of students taken in. Premises must be well-furnished with appropriate fittings, furniture and equipment which are safe, according to health standards and well-maintained.

In addition there will be resources relating to physical resources such classrooms and computer labs. Library books and reference material are also part of the resources dedicated to the program. All health care management programs must refer to Private Healthcare Facilities and Services Act 1998

b. Laboratories and other facilities

Labs should be sufficient to meet the training needs of the students:
   i. Basic science lab
   ii. Chemistry and toxicology labs
   iii. Environmental Health and Science laboratory

Most of the laboratory work can be conducted in groups.

c. Placement in various related premises and centres
   i. Access to clinical set-ups such as – wards, clinics, clinical laboratories, radiology and imaging facilities.
   ii. Access to water catchment areas, water treatment facilities, sewage treatment facilities and garbage disposals facilities system including scheduled waste treatment and disposals.
   iii. Access to multiple industries and plants.
   iv. Access to multiple related government agencies.

CRITERIA FOR SELECTION OF PLACEMENT CENTRES

a. Detail of the registered enterprise or professional practitioner
   - Name
   - Registration Number

- Address
- Working Experience
- Current Apc And Pnc
- Qualification/Cv
- Continuous Professional Development (Cpd) Record
- Disciplinary Record

b. Type of services offered
- Primary Care
- Specialty Care – occupational or environmental health services.

c. Operation hours

Workload (sufficient workload to benefit trainees, but not too much as for productivity to be affected by the students presence); would continuously accept students for placement; valid Business Registration or related accreditation.

Specific Requirements

The proposed list of equipment is equivalent for 40 OSH students. The institutions must take necessary steps to ensure that the equipment available is in keeping with the progress of the profession.

No	Equipment
1	Airborne particle sampler
2	Airborne air sampler
4	Sound level meter
5	Vibration Level Meter
6	Welding Set
7	Portable multi gas meter
8	Portable VOC meter
9	Microbial Sampler
10	Anemometer
11	Mannequin for First aid courses
12	CPR simulation chest pressure detector
13	Fire extinguishers – cut opened, demo set
14	Fire extinguisher – intact ABC

No	Equipment
15	Teaching fire panels
16	Hose reels for courses
17	Safety shoes – construction
18	Safety shoes – chemicals
19	Hard hat
20	Climbing set
21	Wet And Dry Bulb Temperature Monitoring
22	Audiometer
23	Audiometry booth
24	Personal monitoring air sampler
	Weighing scale (for air filter)
25	Air sampler cyclones
26	Air sampler cassettes
27	Ventilation System Demo Set With Fan
28	Ergonomic Time study Portable Camera System
29	Goniometers
31	Different sets of ergonomic chairs
32	Demo set ergonomic computer tables
33	Demo set ergonomic work station
36	Demo lab coats – normal khaki
37	Demo lab coats – chemical resistant
38	Demo non slippery homogenous heavy duty floor tiles
39	Demo emergency eye wash
40	Demo emergency lighting
41	Demo set - fire (warmth) detector, with different glass bulbs
42	Demo set – fire smoke detector
43	Demo emergency shower sets or set in labs
44	Demo easy to fix- home DIY smoke detector sets
45	Demo small car fire extinguisher set
46	Anatomy models set
47	Skull, Spines and skeleton set
48	Safety goggles – all types
49	Computer anti-glare spectacles
50	First Aid Box

No	Equipment
51	First Aid Mobile Set
52	Traffic controller Reflector Suit
53	Different types of specialty work gloves
54	Different specific respirator sets
55	Different types of Ear muffs
56	Face shields
57	Welding face shields
58	Construction Fall protection suits and harnesses
59	Emergency hammer
60	Emergency torch lights
61	Emergency forehead torch
62	Sphygmomanometer
63	Stethoscopes
64	Snellen Chart
65	Stop watch
66	walkie-talkie
67	Stretchers
68	Bandage sets – triangular
69	Safety Ladders
70	Current meter
71	EMF Volt test meter
72	Sets of demo safety labels
73	Sets of Chemical Labels – GHS (Global Harmonized System)
74	Lock-out/tag-out
75	Safety Levels for disabled people
76	Safety patios/tiles for the blind
77	Thermo-hygrometers
78	Thermometers
79	Light meters
87	Back belts
89	Masks, regulators, cannula
90	Emergency Whistles
91	Fire buckets

7. OCCUPATIONAL THERAPY

a. Laboratories and other facilities

Labs should be sufficient to meet the training needs:

a. Activity Of Daily Living
b. Work/Vocational
c. Pediatric/Play/Preschool/School
d. Creative/Leisure
e. Splinting/Pressure Garment/Aids & adaptation/Assistive Device
f. Cognitive & Perceptual Function/Sensory Room
g. Motor Function
h. Basic science laboratory.

Most of the occupational therapy skills can be conducted in groups and the apparatus/equipment ratio to students is 1:5. This is to ensure students are able to practise necessary skills.

b. In-house training centre/hospital training

Either the in-house training centre/hospital for clinical training should have the following disciplines:

a. Traumatology and Orthopaedics
b. Medical
c. Neurology& Neurosurgery
d. Surgical
e. Paediatrics
f. Psychiatry/Mental Health
g. Community/Hospices/Gerontology/School/Industries

c. Criteria for selection of clinical placements

- Hospital/health centre having all the disciplines mentioned above.
- Type of services offered:
  a. Inpatient department
  b. Outpatient department
a. Workload (at least 5 patients/per day during their clinical placement)
b. Supervisor to supervise student.
c. Placement of students in hospitals and private practice must be included in the programme and each placement must not be less than 4 weeks in duration.
d. Students must be provided the placement that meets the clinical learning outcomes

e. The proposed list of equipment is necessary for 25 students in the occupational therapy programme. The quantity of the equipment is in tandem with the increase number of students.

d. Facilities

Space should be sufficient to the number of students taken in. Premises must be well-furnished with appropriate fittings, furniture and equipment which are safe, according to health standards and well-maintained.

e. Laboratories

Space should be sufficient to the number of students taken in. Premises must be well-furnished with appropriate fittings, furniture and equipment which are safe, according to health standards and well-maintained.

f. Clinical Practice Facilities

HEP should provide opportunities for the student to access or training in the following area

a. Traumatology and Orthopaedics
b. Medical
c. Neurology& Neurosurgery
d. Surgical
e. Paediatrics
f. Psychiatry/Mental Health
g. Community/Hospices/Gerontology/School/Industries

OCCUPATIONAL THERAPY EQUIPMENT

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
	Activities of Daily Living		
1.	Feeding Evaluation Kit	1:10	B
2.	Assure Safety Transfer Belt	1:20	B
3.	ADL Lap Tray	1:20	B
4.	Foldable Two Wheel Walker with Seat	1:20	B
5.	Refrigerator - Freezer	1:20	B
6.	Wardrobe	1:20	B
7.	Make-up desk + stool	1:20	B
8.	Door Refrigerator (Panasonic)	1:20	B
9.	Tool Box	1:20	B
10.	Electrical cooker oven *(balang gas, kepala tiub gas, kuali elektrik, periuk kukusan)*	1:22	B
11.	Face towel	1:20	E
12.	Set of Mangkok (set of 4)	1:20	E
13.	ADL Low Vision Aids (goggles, magnifying glass, etc)	1:20	E
14.	Feather Duster	1:20	E
	Motor Function		
15.	Purdue Pegboard	1:10	B
16.	Hand Evaluation Kit	1:10	B
17.	Parallel Bars	1:20	B
18.	Posture Mirror with Mobile Stands	1:20	B
19.	Minnesota Manual Dexterity Test	1:10	B
20.	Touch-Test Sensory Evaluators	1:20	B
21.	Shoulder Wheel	1:20	B
22.	Microcomputer Upper Limb Exerciser	1:20	E
23.	Standing Frame	1:20	B
24.	Fluido DHT 230 Volt Double Extremity	1:20	B
25.	Goniometer - 6 3 / 4"	2:23	B
26.	Goniometer - 8 " (C7512)	2:23	B
27.	Goniometer - 8" (C7509)	2:23	B

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
28.	Goniometers 12 1 / 2 " International Std	2:23	B
29.	Digiband Yellow (25M)	1:23	B
30.	Digiband Green (24M)	1:23	B
31.	Digiband Orange (25M)	1:23	B
32.	Medium Soft Red Therapy Putty	1:23	B
33.	Medium Green Therapy Putty	1;23	B
34.	Medium Soft Yellow Therapy Putty	1:23	B
35.	Super Skeleton Sam on 5 ft stand	1:20	B
36.	Muscle Skeletal Max + Stand	1:20	B
37.	Deluxe Arm skeletal	1:20	B
38.	Deluxe Leg Skeleton	1:20	B
39.	Hand Function Test	1:10	B
40.	Pegboards And Pegs-100 holes (292mm)	1;23	B
41.	Exercise Bikes	1:20	B
42.	Minnesota Manual Dexterity Test	1:10	B
43.	Kinetic Maestra Hand &Wrist CPM Machine	1:22	E
44.	Kinetic Centura Shoulder CPM Machine	1:22	E
45.	Tridex Tube Light R (1.2M)	10:23	E
46.	Tridex Tube Medium G (1.2M)	10:23	E
47.	Tridex Tube Strong BL (1.2M)	10:23	E
48.	Tridex Tube X-Strong BK (1.2M)	10 unit	E
49.	Roeder Manipulative Aptitude Test	1:20	E
50.	Rowing Machine	1:20	E
51.	Multi Gyms	1:20	E
52.	Reebok Active Runner Treadmill	1:20	E
53.	Bowflex Select Tech Dumbbells and Stand	1:20	E
Cognitive Function / Perception			
54.	Rivermead Perceptual Assessment Battery - Complete set	1:10	B
55.	LOTCA Battery Lowenstein Occ. Therapy	1:20	B
56.	LOTCA Battery Lowenstein Occ. Therapy (Child)	1:20	B

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
57.	Neuro Scanner 97.4 + Professional, Level 1 Training	1:20	B
58.	COTNAB	1:20	B
59.	Brain 8-parts	1:20	B
60.	LOTCA Battery 2nd Edition	1:10	B
61.	LOTCA-G Cognitive Battery (Geriatric)	1:10	B
62.	Stroke Driver Screening Assessment	1:23	B
63.	Computer-Aided Cognitive rehabilitation	1:10	E
64.	Brain Injury Visual Assm. Batery for adult	1:20	E
65.	Vienna Test System / Cognitive rehabilitation software.	1:20	E
Aids and adaptation / Assistive device			
66.	Wheelchair detachable Armrest & Detachable Footrest	1:05	B
67.	Foldable Commode Wheelchair	1:20	B
68.	Elevating Adult Wheelchair	1:20	B
69.	Exercise Steps for Adults	1:20	B
70.	Table Adapta with Switch	1:20	B
71.	Chrome Plated Reclining Wheel Chair	1:20	E
72.	PVI Wheel Chair Ramp	1:20	B
73.	Tadpole Multiuse	1:20	B
74.	Pillow Perfect (heel, leg, elbow, knee, body, cervical)	1:20	B
75.	Patient Lifter Complete with Sling	1:22	E
76.	JAW Professional – Software	1:20	E
77.	D-Braille Embosser	1:20	E
78.	VNBT / QT VoicenoteM power ^Braille Keyboard	1:20	E
79.	BR- 24 Brailliant-24 Braille Cells display.	1:20	E
80.	Folding Mobility Cane - 48"L	1:20	E
81.	Folding Mobility Cane - 50"L	1:20	E
82.	Folding Mobility Cane - 52"L	1:20	E

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
Developmental			
83.	Tumble Forms Rools set (C 2794 C, C 2794 G, C 2794 E, C 2794 D, C 2794 H, C 2794J	1:20	B
84.	Bruininks Oseretsky Test of Motor Proficiency: 2nd Edition	1:20	B
85.	Ball Pool + 500 Balls	1:20	B
86.	Corner Seat Large Base	1:20	B
87.	Trampoline	1:20	B
88.	Paint brush set of 3	1:01	B
89.	PDMS-2 Peabody Developmental Motor Scales 2nd edition	1:20	B
90.	High Speed Overedge Machine	1:10	B
91.	Portage Early Education Programme	1;20	B
92.	Deluxe Vestibulator 11 Set	1:20	B
93.	Play House Set	1:22	B
94.	Ball Bath (small)	1:22	B
95.	Foam Board	1:23	B
96.	Coloured Foam Tubing	1:23	B
97.	Puzzle; a) Fruit b) Vegetable c) Toys d) Baby Items	1:23	B
98.	Giant Knob Puzzle: Animals	1:23	B
99.	Stacking Ring Switch	1:23	B
100.	Multilid Sorting Box	1;23	B
101.	Easy Grip Scissors	1:23	B
102.	Rivermead Perceptual Assessment Battery, Complete	1:10	B
103.	Peabody Development Motor Scales 2nd Edition	1:20	B
104.	Geo-Lastic Art	1:23	B
105.	Plasticine set of 5	1:10	E
106.	Rock &Rody	1:23	E
107.	Hop 45 cm	1:23	E
108.	Hop 55 cm	1;23	E

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
109.	TheraBolly	1:23	E
110.	Mitt (pair)	1:23	E
111.	Booties (pair)	1:23	E
112.	Round table	1:08	E
113.	Wooden trolley	1:10	E
114.	Paint roller with tray	1:20	E
115.	Super Sound Sorter	1:23	E
116.	Rotating Disc Puzzle	1;23	E
117.	Wooden Ball Run	1:23	E
118.	Balance-beam	3:23	E
119.	PEDI Scoring Forms ISBN:076-1617	1:20	E
120.	PEDI Software_ISBN:015-8010-37x	1:20	E
121.	PEDI Manual	1:20	E
122.	Laptop for PEDI software	1:20	E
123.	DOTCA-CH Battery	1:20	E
124.	Clown Box	1;23	E
125.	Balance-Pad Plus	5:22	E
126.	Movin' Step	5:23	E
127.	Magic Professional with Speech	1:20	E
Preschool / School			
128.	Portable Early Education Programme	1:20	B
129.	Preschool Visual Motor Integration (PVMIA)	1:23	B
130.	8439-7 Complete Writing Kit	1:20	E
	8448-6 Practical Guide to Handwriting-Manuscript	1:20	E
	8449-4 Practical Guide to Handwriting-Cursive	1:20	E
	Evaluation Tools of Children's Handwriting (ETCH)	1:20	E
	School Function Assessment (SFA) Complete Kit	1:20	E
131.	Preschool Visual-Motor Integration Assessment (PVMIA)	1:20	E

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
Work / Vocational			
132.	Multifunctional workstation	1:20	B
133.	Adaptive Height Adjustable Therapy Work Table	1:20	B
134.	TPAL (Valpar Therapist's)	1:20	B
135.	VALPAR (Functional Capacity Evaluation System)	1:30	E
136.	FCE Software System	1:30	E
137.	Maltron BF-916 Body Composition Analyzer	1:20	E
Compression			
138.	Heavy Duty Zig zag Sewing Machine	1:02	B
139.	Volumeter Hand Edema Assessment Set	1:10	B
140.	Satinet material (per meter)	1:01	B
141.	Edema Control:		
	- Foam Arm Support	1:20	B
	-Waterproof Support	1:20	B
142.	Scar & Hypersensitivity:		
	- Mini Massager	1:20	B
	- Vibrator	1:20	B
143.	Edema Control (material)		
	a) Satinet Material – 50 m / roll / Lycra (per meter)	1:1m	B
	b) Coban 1"x 5yd - 30 roll / box	1:1yard	B
144.	a) Stokinette 1'	1:1yard	B
	b) Stokinette 3"	1:1yard	B
	c) Stokinette 5'	1:1yard	B
145.	a) Bandage 2"	1:1m	B
	b) Bandage 5"	1:1m	B
146.	Scissors	1:04	B
147.	Threads	1:1roll	B
148.	Sewing Machine Portable	1:02	B
149.	Measuring tape	1:23	B

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
150.	Crepe Bandage 7.5cmx4.5Mperbox of 12 rolls	1:23	B
151.	Satinette Material for Pressure Garments	1:23	B
152.	Heavy Duty Needle Nose pliers 6" L	1:23	B
153.	Tredle Lockstitch Machine + 4 drawers + 1 pocket	1:20	B
154.	Pressure Garments Accessories (*benang, gunting, kain, brown paper, kertasminyak, kertas, geometric box, velcro, minyakmesin*)	1:20	E
Sensory			
155.	Multisensory System	1:20	B
156.	Sensory Stimulation Activities Kit	1:22	B
157.	Sensorimotor Performance Analysis (SPA)	1:23	B
158.	Para-Care Parafin Bath	1:23	B
159.	Wax Remover	1;23	B
160.	Wax Refill (Unscented)	1:23	B
161.	Sensory Profile School Companion Complete Kit	1:20	E
	Adolescent / Adult Sensory Profile Complete Kit	1:20	E
	Infant / Toddler Sensory Profile Complete Kit	1:20	E
	Sensory Profile Complete Kit	1:20	E
162.	Sensory Stimulation Activities Kit	1:20	E
Splint and Orthotic			
163.	Water Suspan For Heating Thermos (Small)	1:08	B
164.	Splinting tools & Accessories	1:05	B
165.	Fiskars Heavy-Duty Shears L 9"	1:23	B
166.	Thermoplastic perforated Non-Bond (2 sheets / cs)	1:04	B
167.	Thermoplastic		
	1 / 8" x 18" x 24 " (4 sheets / cs)	1:04	B
	b) Perforated Non-Bond	1:04	B
	1 / 8" x 24" x 36" (2 Sheets / cs)	1:04	
168.	Padding		

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
	a) Firm Foam Padding	1:10	B
	b) Luxafoam (soft Sponge)	1:10	B
169.	Hook & Loop Kit		
	a) Hook – Plain 25 yd 1" (per yard	1:1yard	B
170.	Heat Pan (small)	2:22	B
171.	Heat Pan (large)	4:22	B
172.	Wedge Hand positioner	1:23	B
173.	Heavy -Duty Wire Cutters: 22 cm	1:23	B
174.	Cutting Mat 45.5.x 61 cm	1:23	B
175.	Static Progressive Splinting Up Close and Personal	1:23	B
176.	Tendon Hammer dia. 5cm flexible plastic handle 30cm	1:23	B
177.	Sets of Splinting Tools (in tool box)	1:20	B
178.	I Thermoplastic Splinting Material	1:23	B
Creative Therapy			
179.	Art and craft material	1:20	E
180.	Audio visual equipment		
Play / Leisure			
181.	Music Instrument System (Yamaha Keyboard,	1:22	E
	Cordless Mic, Conga Drum, Yamaha Folk		E
	Guitar (bag,string) JD folk guitar, Guiro, Ratchet,		E
	Tamborine, Kompang, Casternet, Wooden		E
	Shaker, Bell set, Hand symbal, Bongo, Maracas		E
	Woodblock, wooden claves		E
182.	PA Karaoke Power Mixer & 2 unit Beta 3 speaker with stands, monitor, Hi-Fi radio DVD / CD player	1:22	E
183.	Plasma TV 42"	1:50	E
184.	Activity Ball	1:23	E

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
Psychological / Relaxation			
185.	Stress Management Neurofeedback Package (BOSLAB), Notebook & DLP Projector	1:20	B
186.	Biofeedback Computer Game	1:20	E
187.	Behavioral Inattention Test Complete Kit	1:20	E
Teaching aid			
188.	Digital Camera	1:20	B
189.	LCD Projector (per lecture room)	1:01	B
190.	Screen (per lecture room)	1:01	B
191.	Whiteboard (per lecture room)	1:01	B
192.	Notice board	1:50	B
193.	Spinal Cord Model	1:20	B
194.	Glucometer + Glucostrips	1:20	B
195.	Accuchek Advantage Glucose strips x 25 pcs	1:23	B
196.	Stethoscope	1:20	B
197.	Thermometer : Digital	1:10	B
198.	Patella Hammer	1:01	B
199.	Lumbar Vertebra with prolapsed disc. flexibility mounted & Brain Ventrical	1:20	B
200.	Lumbar Spinal Column, Deluxe Osteoporosis (model 3 vertebrae & Cervical collar (adult)	1:20	B
201.	Cervical Spinal Column & Thoracic Spinal Column	1:20	B
202.	Classic Torso with Open Back, 21-parts	1:22	B
203.	Neck Roll Cervical 20"x3", Night roll & Pillow perfect-cervical roll	1:20	B
204.	Nervous System, 1 / 2 life-size	1:23	B
205.	Internal Hand Structure Model 3 parts	1:23	B
206.	Stethoscope adult	1:05	B
207.	BP Set Sphygmomameter Mercurial	1:05	B
208.	Heavy Duty Table / Trolley	1:08	B

No	Equipment	Ratio	Benchmarked (B) / Enhanced (E)
209.	Trolleys 3 tiers VS 124-C	1:20	B
210.	Dressing Trolleys with 2 drawers	1:20	B
211.	Foal BP set (Child)	1:10	B
212.	Child PCR Mannequin	1:20	B
213.	Clinical Trolley	1:20	
	a) VS 129-B + (2 drawers)	1	B
	b) VS 124-C3	1	B
214.	Disk-Criminator (set of 2 disc)	1:10	B
215.	Body Fat Monitor (Omron)	1:20	E
216.	Body Fat Analyser	1;20	E
217.	Glucometer	1:20	E
218.	Digital Thermometer	1:10	E
219.	Tangent Screen	1:20	E
220.	Research Power Lab system	1:10	E
221.	Hard Disk Drive Handycam	1:20	E
	Memory Stick 4 GB	1:20	E
	VNP-FH100 Battery (Superhigh Capacity)	1:20	E
	Bag VA30	1:20	E
	ECM HW1 Microphone	1:10	E

8. PARAMEDICAL SCIENCE

DIPLOMA & BACHELOR DEGREE

Generic requirements for this subgroup are:

A. Facilities

Space should be sufficient to the number of student taken in. Premises must bewell furnished with appropriate fittings, furniture and equipment which are safe, according to health standard and well-maintained.

In addition, there will be resources relating to physical resources such class rooms and computer labs. Library books and reference material a real so part of the resources dedicated to the program. All health care management programs must refer to Private Healthcare Facilities and Services Act 1998

B. Skill/Clinical Laboratory

Space should be sufficient to the number of student taken in. Minimum space per student for clinical skill laboratory should be $1m^2$/student. Premises must be well- maintained and furnished with appropriate fittings, furniture and equipment which are safe, according to health standard, building code and safety standard.
- Anatomy Laboratory.
- Clinical skill or simulation laboratory.

Most of the paramedic skills can be conducted in groups and the apparatus/equipmentratiotostudentis1:5. This to ensure students are practise the necessary skills.

C. Clinical Practice Facilities

HEPshouldprovideopportunitiesforthestudenttoaccessortraininginthefollowing area:
- Medical
- Orthopaedic, Surgery and Trauma
- Labour Room
- Paediatrics
- Psychiatry
- Emergency Medicine
- Pre-Hospital Care Services

- Primary Health Care
- Anaesthesia & Critical Care

CRITERIA FOR SELECTIONOFCLINICALPLACEMENT IN ACCREDITED CENTRE

- Hospital/Health facilities having following disciplines:
    a) Medical
    b) Orthopaedic, Surgery and Trauma
    c) Labour Room
    d) Paediatrics
    e) Psychiatry
    f) Emergency Medicine
    g) Pre-Hospital Care Services
    h) Primary Health Care
    i) Anaesthesia & Critical Care
- Type of services offered:
    a) In patient services
    b) Outpatient services
- Criteria for Pre-Hospital Care services placement require the following:
    a) Pre-Hospital Care Unit leads by Emergency Physician.
    b) Pre hospital Care service provider with establish organisation and clear medical direction under Emergency Physician.
    c) Active in core Pre-Hospital Service
        - Ambulance service
        - Major incident management
        - Medical stand by
        - Emergency Despatch Service.
    d) For primary health clinic placement, the facility must have ambulance services.
- Student must be provided with the placement that meets the clinical learning outcomes.

The proposed list of equipment is necessary for 25 students in the programme. The quantity of the equipment is in tandem with the increase number of students.

No		Equipment	Minimum requirement
A		FUNDAMENTAL	
	i.	Auditorium - c/w chairs, side table, projector and audio visual system	1
	ii.	Lecture Halls- c/w chairs, side table, projector and audio visual system	1
	iii.	Tutorial room - c/w chairs, table, audio visual system	2
	iv.	Consultation room	1
	v.	Conference room - meeting bench with chairs	1
	vi.	Library and information centres - c/w internet accessibility	1
	vii.	Student Social Spaces	1
	viii.	Skill lab	1
	ix.	Simulation lab - c/w simulator as listed in C & D	1
	x.	Ambulance simulator or ambulance use for training (1)	1
	xi.	In-department call room (posting sites)	
	xii.	Examination hall - c/w tables and chairs	1
	xiii.	Examination ward - c/w patient beds, pillows and patients trolleys	1
	xiv.	Triage area (posting sites)	
	xv.	Resuscitation room (posting sites)	
	xvi.	Emergency room(posting sites)	
	xvii.	Trauma clinic/ trauma lane (posting sites)	
	xviii.	Pre-Hospital care unit (posting sites)	
	xix.	ED communication center (posting sites)	
	xx.	Operation/ procedure room (posting sites)	
	xxi.	Non-Emergency Department facilities such as (posting sites): - Labor room - Intensive care unit - Pediatric intensive care unit - clinical ward	

B	*FURNITURE*			
	i.	Student Locker (to the number of students)	25	
	ii.	Examination couch	3	
	iii.	Resuscitation trolley / cart	2	
	iv.	Patient trolley	3	
	v.	Assessment & Diagnostics - portable ultrasound (1) - portable ventilator (1) - portable multiparamonitor (1) - Stestescope (5) - Sphymomanometer (5) - Fundoscope (2) - Otoscope (2) - Tendon hammer (2) - X-ray view box (2) or PAC system Viewer - ABG machine (posting sites) - POCT lab (posting sites)		
C	*INTERVENTION*			
		Available in simulation lab and skill lab.		
	i.	BLS manikin - adults - infant	 8 8	
	ii.	ALS manikin - adults - infant	 2 2	
	iii.	High-technology simulator- - adults - pediatric (optional)	 1 1	
	iv.	Airway trainer manikin (2)	2	
	v.	Maternity delivery simulator (2)	2	
	vi.	Choking manikin (2)	2	
	vii.	Laryngoscope with different sizes blades (3)	3	
	viii.	Airway & ventilation set - Endotracheal tube various sizes - Laryngeal Mask Airway- varous sizes		

		- Other form of supraglotic airway	
		- tylets	
		- ETT stabiliser	
		- Capnograph	
		- BVM	
		- Oxygen tank with pressure gauge	
	ix.	Defibrillator- manual	2
	x.	Automated External defibrillator (AED) trainer	2
	xi.	IV giving sets	
	xii.	Branulas – various sizes	
	xiii.	Intraosseous cannulation set	
	xiv.	Peritoneal tap set.	
	xv.	Bandages- Crepe, large arm sling	25
	xvi.	Plaster-Of-Paris (POP)	25
	xvii.	Chest tube set	10
	xviii.	Suturing set	10
	xix.	Limb Immobilizer- various sizes & types (including traction splint)	1
	xx.	Pelvic immobilizer- Binders and clamp	1
	xxi.	Spinal board – long	2
	xxii.	Extrication Device	1
	xxiii.	2-way radio communication set	6 sets

9. PHYSIOTHERAPY

Generic requirements for this subgroup are:

a. Facilities

Space should be sufficient to the number of students taken in. Premises must be well-furnished with appropriate fittings, furniture and equipment which are safe, according to health standards and well-maintained.

b. Laboratories

Space should be sufficient to the number of students taken in. Premises must be well-furnished with appropriate fittings, furniture and equipment which are safe, according to health standards and well-maintained.

- gymnasium with adjustable manipulative beds
- Electrotherapy laboratory with wooden couches
- Anatomy laboratory with human body models
- Hydrotherapy/Pool**
- Physiology Lab **

** HEP need to provide the evidence of the access to these facilities

Most of the physiotherapeutic skills can be conducted in groups and the apparatus/equipment ratio to students is 1:5. This is to ensure students are able to practice the necessary skills.

c. Clinical Practice Facilities

HEP should provide opportunities for the student to access or training in the following area:

- Traumatology and Orthopaedics
- Cardiopulmonary & cardiovascular
- Surgery & Intensive care/Acute care
- Neurology and Neurosurgery
- Paediatrics
- Obstetrics and Gynaecology
- Sports and Fitness
- Primary care
- Geriatric
- Women and Men Health*
- Medical

- Oncology Palliative care*
- Mental health*
- ENT*
- Special Need Child*

*optional for enhanced standard

d. Criteria for selection of clinical placements

- Hospital/health center having some of the disciplines mentioned above.
- Type of services offered:
  a. Inpatient department
  b. Outpatient department
- Workload (at least 5 patients per day during their clinical placement)
- Students must be provided the placement that meets the clinical learning outcomes

The proposed list of equipment is necessary for **25 students** per practical class in the physiotherapy programme. The quantity of the equipment is in tandem with the increase number of students.

No	Equiptment	Minimum Requirement
A	**FUNDAMENTAL**	
1.	Didactic Skeletal Model (with muscle marking)	5
2.	Didactic life size skull	5
3.	Flexible spine model	5
4.	Skeletal with muscle	1
5.	Adult Pelvic Model	1
6.	Knee Joint model with ligament	5
7.	Skeletal with muscle	1
8.	Foot and ankle model with ligament	5
9.	Shoulder joint with ligament	5
10	Hand skeleton model with ligament and muscle	1
11.	Female pelvic	1
12.	Brain Model(detachable)	1
13.	Brain Model with arteries	5
14.	Lung anatomical Model	5
15.	Heart anatomical model	5

16.	Three Part ear anatomical Model	1
17.	Adult Mannequin	2
18.	Child Mannequin	2
B	**FURNITURE**	
19.	Flexible and adjustable plinth	8
20.	Wooden Couch	8
21.	Wooden Chair	8
22.	Foot rest	5
23.	Bobath Couch	2
24.	Tilt table	1
25.	Adult adjustable Parallel Bar	1
26.	Long Mirror	2
27.	Weighing scale with height	1
28.	Corner stair case	1
39.	Mattress (i.e. Airex) size Approx. 78.7" × 39.4" × 0.6"	5
30.	Stool (set of nested footstool with different height)	2
31.	Pillow	20
32.	Bath Towel	20
33.	Suspension frame with accessories	2
34.	Sliding board for transferring	2
35.	Gait Belt	2
C	**ASSESSMENT AND DIAGNOSTIC**	
36.	Goniometer set	5
37.	Hand Assessment set	2
38.	Inclinometer	3
39.	Stethoscope adult	10
40.	Dual Head stethoscope	2
41.	Stethoscope paediatric	5
42.	Manual Sphygmomanometer	10
43.	Pulse oximeter	10
44.	Digital video recorder	1
45.	Digital Camera	1
46.	Stop watch	10
47.	Timer	10
48.	Posture analysis grade	1

49.	X-ray viewer	2
50.	Peak flow meter	10
51.	Hot and cold discrimination kits	2
52.	Monofilaments sets	1
53.	Tendon Hammer	10
54.	Tuning Fork	5
55.	Stabiliser pressure biofeedback	5
56.	Child Assessment set (Peabody PDMS-2)	1
57.	GMFM user manual	1
D	**Electrotherapy**	
58.	Hydro collator tank with pack (12 pack)	1
59.	Paraffin wax bath (large)	1
60.	Infrared Ray	2
61.	Shortwave Diathermy	2
62.	Cryocuff complete set	5
63.	Freezer / Refrigerator for cold pack or Ice machine	1
64.	Portable Tens	10
65.	Laser	2
66.	Biofeedback	2
67.	Electrical stimulation machine (with IF, HVC and other low frequency current)	5
68.	Ultrasound	5
69.	Traction Machine Lumbar	1
70.	Traction Machine Cervical	1
71.	Portable Nebuliser	2
72.	Portable Suction	2
73.	Shockwave *	Optional
74.	Real time ultrasound *	Optional
E	**Therapeutic Exercises**	
75.	Gym Ball 55"	5
76.	Gym Ball 65 "	5
77.	Dumbbells (set of1 – 15lbs)	1
78.	Sandbag (Set of 1-15lbs)	1
79.	Medicine ball sets (1-6kg)	1
80.	Trampoline (adult)	1

81.	Static Cycling (ergocycle)	2
82.	Recumbent bikes	1
83.	Treadmill	1
84.	Cross trainer/Elliptical	1
85.	Stepper	1
86.	Pedal Exerciser	5
87.	Overhead Pulley	2
88.	Stacking cone 6" set	2
89.	Wobble Board sets	2
90.	Wooden pegboard	2
91.	Push up Block	5
92.	Digiflex Hand exerciser set	2
93.	Foam Roller	5
94.	Balance beam	5
95.	Soft Board /Stability trainer set	5
96.	Exercises stick (weight) set	2
97.	Resistive Band Light (50 yards)	2
98.	Resistive Band Medium (50 Yards)	2
99.	Resistive Band Heavy (50 yards)	2
100.	Plastic Cones Medium (10)	2
101.	Plastics Cones Small (10)	2
102.	Adult Wheelchair	5
103.	Recumbent Wheelchair	2
104.	Sport wheelchair	2
105.	Crutches (Adult)	5
106.	Crutches (Paediatric)	5
107.	Elbow Crutches	5
108.	Walking stick	5
109.	Adult Rollator	2
110.	Quadripod	5
111.	Adjustable working stick	5
112	Wall bar	1
113	Paediatric Positioning (grasshopper tumble form)	1`
114.	Set of Exercises roll (height 6", 8" and 12" and 16")	1 SET
115.	Wedges (elevation 4", 6" 10" and 12")	1 SET

116.	Acapella (Vibratory PEP System)	5
117.	Flutter	5
118.	Pressure Biofeedback	5
119	Isokinetic Machine	Optional
120	CPM machine	Optional
121	Biodex Balance Machine	Optional

10. RADIATION THERAPY

Diploma and Degree

No.	Modules	Ratio	Benchmarked (B) / Enhanced (E)
1.	Human Anatomy and Physiology Standard anatomy and physiology models, phantoms, apparatus and teaching aids for theory and demonstration session	1:20	B
2.	General Physics Basic experimental model/apparatus for laboratory sessions	1:20	B
3.	General pathology - Anatomical models, charts and posters for teaching aids	1:20	B
4.	Radiation Physics (including radiation protection) Basic experimental apparatus Radiation protection accessories: • Lead-rubber gowns and/or aprons • Lead-glass goggles • Radiation monitoring devices - TLD, film badge, pocket dosimeter, Geiger-Muller counter	1:20	B
5.	Patient Care in Radiation Therapy: for basic nursing care procedures to be equipped with: • bed, mattress, pillow, linen, • bed-pan & urinal, • thermometer – conventional & digital set • sphygmomanometer & stethoscope • suction apparatus, • breathing/resuscitation apparatus • CPR phantom – adult & baby • Emergency trolley • Wheelchair • Patient trolley, transfer board and relevant lifting apparatus. • Resuscitation apparatus • Models (mannequins) with colostomy and tracheostomy	1:20	B

No.	Modules	Ratio	Benchmarked (B) / Enhanced (E)
6.	Radiation Therapy Planning and Delivery • Immobilisation devices, • Treatment couch • Breast board • Customised head rest • Customised body board • Human phantom / mannequins • Measuring calipers	1:20	B
7.	Radiation Therapy Equipment, Radiation Instrumentation and Accessories Simulation/X-ray Room to be equipped with: • Modern radiotherapy equipment with treatment table and EPID • Screen/Films/cassette of various sizes • Illuminators • X-ray accessories – lead gown / apron, immobilisation devices, cassette holder etc. • Radiographic phantoms with various models AND/OR • **Integrated Computed radiography system / Digital radiography with Image Reader & monitor console/workstation **Imaging plate for Computed radiography system	1:20	E
8.	Imaging in Radiation Therapy Sectional Anatomy • Sectional anatomical models/cadaver slices • Radiographic images • Computer terminals • Illuminators	1:10	B
9.	• Treatment planning software for teaching purposes • Digital sectional anatomical model or cadaver slices • Isodose curves and charts	1:10	E

No.	Modules	Ratio	Benchmarked (B) / Enhanced (E)
10.	Mould technology • Wax build up apparatus • Beam modification devices • Beam directional apparatus • Immobilization devices • Hot water bath • Cerroband apparatus	1:10	E
11.	Quality Assurance in Radiation Therapy Sets of QA tools for Processing and Radiation Therapy Equipment	1:10	E

CRITERIA FOR SELECTION OF CLINICAL PLACEMENTS

The Radiation Therapy Department in hospitals chosen for clinical placements should have:

   a. At least one Radiotherapy Simulator (CT-SIM).

   b. Linear Accelerator with photon and electron modality for EBT, IMRT and IGRT.

   c. Brachytherapy facilities.

   d. Radiotherapy Planning System.

   e. Workload (at least 20 patients per day during their clinical placements).

11. SPEECH SCIENCES (Bachelor's Degree)

a. Mandatory resources for clinical practice:
  i.   1 therapy room with live observation facilities per 8 clinical year students
  ii. 1 toy-resource room per programme
  iii. 1 set of instrument for the assessment of voice per programme
  iv. 1 set of instrument for the assessment of resonance per programme
  v.   1 set of standardised assessment for childhood language disorders per programme
  vi. 1 set of standardised assessment for adult language disorders per programme
  vii. 1 set of standardised assessment for speech sound disorders per programme
  viii. 1 set of standardised assessment for motor speech disorders per programme
  ix. 1 set of standardised assessment for fluency disorders per programme
  x.   1 set of standardised assessment for learning disabilities per programme
  xi. 1 set of standardised assessment for hearing impairment per programme
  xii. 1 set of assessment tool for oro-motor structure and function per programme
  xiii. 1 set video recording equipment per 8 clinical year students
  xiv. 1 set audio visual equipment per 15 clinical year students
  xv. 1 set audio recorder per therapy room

b. Recommended resources:
  i.   1 set of CCTV equipment per speech therapy room
  ii. 1 set of electropalatography per programme
  iii. 1 set of swallowing workstation per programme
  iv. 1 speech laboratory per programme