



MALAWI UNIVERSITY
OF SCIENCE AND
TECHNOLOGY



POSTGRADUATE PROGRAMMES

Where Excellence Reigns



UNIVERSITY VISION

A world class centre of science and technology education, research and entrepreneurship.

UNIVERSITY MISSION

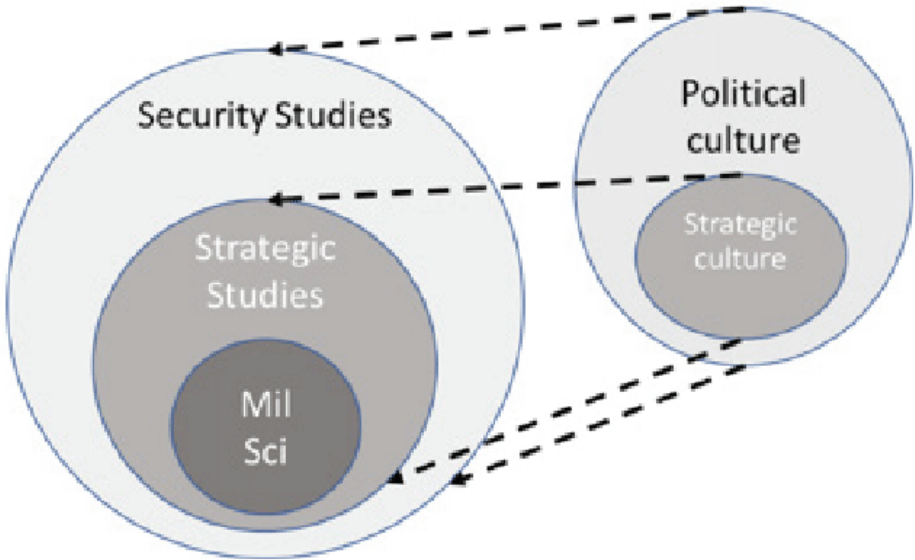
To provide a conducive environment for quality education, training, research, entrepreneurship and outreach to facilitate economic growth in Malawi and beyond.

UNIVERSITY CORE VALUES

Commitment, professionalism, integrity, competitiveness, openness to diversity, entrepreneurship, and innovativeness



International Relations



1, POSTGRADUATE DIPLOMA IN STRATEGIC STUDIES

The programme is a multidisciplinary study area that deals with strategic studies and its unique connections within the defence, peace, and security context. It is aimed at responding to the demand of highly qualified persons in the growing technological and competitive sector of defence, peace and security, and harnessing of innovation and strategic trends in defence, peace and security.

It emphasises on strategy as related to war and peace, with particular reference to the role, development and use of military power as a strategic resource and its impact on the international system. Students in the programme will acquire several theoretical, conceptual, and analytical tools with which to filter, order and attach contextual meaning to a plethora of themes or issues regarding national security, strategy, international relations and foreign policy. With the proposed modules, students will attain knowledge,

attitude, and skills that will lead to strategic and practical leadership in the defence, peace, and security sector.

Courses include Leader Assessment & Development, Critical Thinking & Reasoning Skills, Classical Military Thoughts, Leadership Command & Management, Research, Revolution of Military Affairs, Human Rights, International Humanitarian Law, International Relations, National Security, Peace & Conflict Studies, Civil Military Relations

Strategy, Technology & Warfare, Battle & Campaign Analysis, Disaster Management, Counter Terrorism, and Peace Support Operations.

2, MSc IN DISASTER RISK MANAGEMENT

The trend of increasing disasters and related losses is a truly global challenge. The changing global risk landscape due to processes such as climate change,

urbanisation, and the increasing complexity of modern society poses major challenges for sustainable development and must be addressed with an interdisciplinary approach. A growing number of governments and international organisations acknowledge the necessity to increase their efforts in disaster risk management and climate change adaptation in order to successfully adjust to changing environments and develop safe and sustainable societies. This has created considerable scope for highly integrated, cutting-edge disaster risk and resilience research.

The programme has been designed to develop knowledge, skills and competencies required for leadership in careers related to disaster risk management. It integrates various disciplines and approaches in hazard, vulnerability and risk assessment, governance as well as risk reduction measures thereby placing graduates at a higher advantage in the DRM sector. The programme has also focused on applying the theory-based aspects through practical and research approaches. Thus, producing experts in analysing complex multifactorial disasters and providing sustainable solutions in the DRM sector.

Some of the modules that students enrolled in this program will cover include Fundamentals of GIS and Remote Sensing; Climate Science for DRM; Digital Technologies in DRM; Early Warning Systems; Humanitarian Response Practices and Climate and Disaster Risk Financing.

3, MSc IN BIODIVERSITY INFORMATICS

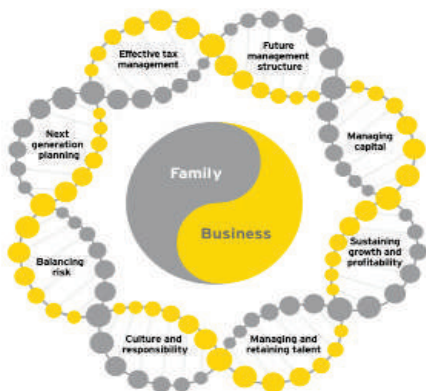
While there are many efforts in Malawi to document the country's biological diversity (i.e., academic research

reports, museum, herbarium, EIA reports, etc), much of the data remains in grey reports or collections, inaccessible to users. As a result, there are few biodiversity related policies that make use of these data. There are also very few efforts to analyse long term data to understand trends and impacts of different policies/management strategies. This contributes to unnecessary spending of finances resulting from collection of multiple data in the same area by different persons/ teams or institutions simply because they do not know that recent data in their subject area already exists.

This programme will, therefore, address biodiversity data related problems by building capacity at post graduate level in mobilising data, making that data easily accessible and using it in decision making. It will complement the other efforts by including the mobilisation of these data sets as part of its student activities. The program will produce scientists who will provide leadership and necessary sophisticated skills in facility laboratories in biodiversity and informatics, perform research and applying it for the preservation and sustainable development of the biodiversity.



Courses include Biodiversity Context, Principles of Informatics, Ecosystems Ecology, Computer Programming, Biodiversity Data Capture, Statistical Analysis and Ecological Modelling, Research Methods, Seminar I, Geospatial Databases and Analysis, Data Science for Biodiversity, Biodiversity Data Use, Climate Change and Biodiversity, Science Communication and Policy, Entrepreneurship and Innovation, Dissertation



4, MBA IN STRATEGIC FAMILY BUSINESS

The programme is designed to ensure success and full contribution of family businesses to the socio-economic development of Malawi. The growth, successful succession and inter-generational survival of family businesses in Malawi is critical to reducing poverty in Malawi.

It is specifically designed to impart practical knowledge and the basic concepts related to management and administration of family businesses, as well as the different processes and tools that are useful for the effective handling of these companies. The programme teaches refined business skills within the context of family dynamics. Students will learn how to develop an effective financial strategy, wealth management portfolio and policies for conducting business and learn how to merge the interests of the

family with wealth acquisition to develop a strong future for everyone.

Graduates are better prepared to face the unique challenges of owning a family business. They understand the importance of creating balanced family relationships while driving successful business outcomes. Among the courses to be covered include Fundamentals of Family; Business Organizational Culture in Family Business; Psychology and Sociology in Businesses; Succession and Trust Law; Business Ethics and Corporate Governance; Entrepreneurship and Innovation; and Leadership. Apart from core modules, there will also be electives that students will choose from. Some of the electives are Commercial Law; Strategic Marketing Management; and Change Management.



5, MEng IN BIOMEDICAL ENGINEERING

The healthcare in Malawi, just like in other sub-Saharan countries, is facing a lot of challenges as evidenced by poor quantitative



Second year is dedicated to dissertation writing.

6, MSc IN INFORMATION TECHNOLOGY

The MSc in Information Technology programme is designed to help the graduate student prepare for the intellectual, analytical and practical challenges of a career in IT. Professionals with this qualification can pursue exciting, high-level jobs in diverse fields in both the public and private sectors. Graduates under the programme develop

exceptional organizational, research, customer service, and problem-solving skills, which make them qualify for managerial and leadership roles in national and multinational companies. Some of the popular positions for degree-holders include information technology project manager, chief technology officer, cloud architect, chief information officer, management consultant, cyber security manager, and computer systems analyst.

and qualitative health output and outcome due to, inter alia, lack of or inadequate skilled biomedical engineers and technicians who can be used in the designing, manufacturing, adapting and maintenance of medical equipment. The health delivery system in Malawi requires well educated, well trained and skilled biomedical engineers who can assist in solving healthcare technological problems with the aim of raising the standards of healthcare delivery in Malawi and beyond.

Biomedical Engineering is the application of engineering principles and techniques to the medical field. It combines the design and problem-solving skills of engineering with medical and biological sciences to help improve patient health care and the quality of life of individuals. Graduates can work across industries but mostly in the health sector, engineering, manufacturing, and consultancies.

First year taught modules will include Medical Sciences, Engineering Science, Bio-Ethics and Professional Studies, Regenerative Medicine, Biomedical Signal Processing, Principles of Biomedical Engineering, Drug Delivery and Nanomedicine, Biomechanics and Rehabilitation Engineering, Human-Machine Interface, Advanced Biocomputing and Bioinformatics, Advanced Biomaterials and Biomedical Research Methods and Seminar.

Some of the modules under the programme include Databases, Data Mining & Warehousing, Advanced Operating Systems, IT Ethics/IT and Society, Software Engineering, Mobile Applications Programming and Web Design, Advanced Computer Architecture, IT Project Management, Emerging Technologies & Innovation, Entrepreneurship, Research Methods in Computing, Supervised Research and Dissertation.

7, MEng IN APPLIED CHEMICAL ENGINEERING

The programme aims at preparing graduates for professional careers in chemical engineering, enabling them to understand, solve, and manage problems in chemical industries, and developing their ability to reason critically, collect, analyze, evaluate and synthesize data in order to

facilitate optimization. The programme is intended at addressing a shortfall in human resource needs in Chemical Engineering for industrial development in Malawi and beyond. Graduates from the programme will be capable of solving design and applied chemical engineering problems as well as performing supervisory functions. They will also formulate professional simulation and design tools related to Chemical Engineering and independently and creatively, design, plan and conduct complex chemical engineering projects.

Students will spend first year doing taught modules that include Advanced Food Processing, Renewable Energy Engineering, Advanced Research Methods, Project Management, Applied Thermodynamics, Environmental Engineering, Advanced Chemical Engineering Plant Design, Advanced Process Optimization, Series of lectures/ seminars, Advanced Design and Computational Method, Waste Water Handling and Research Project I. Second year is for dissertation writing.

8, MSc IN DATA SCIENCE

Data science is the study of the computational principles, methods, and systems for extracting and structuring knowledge from data, and the application and use of those

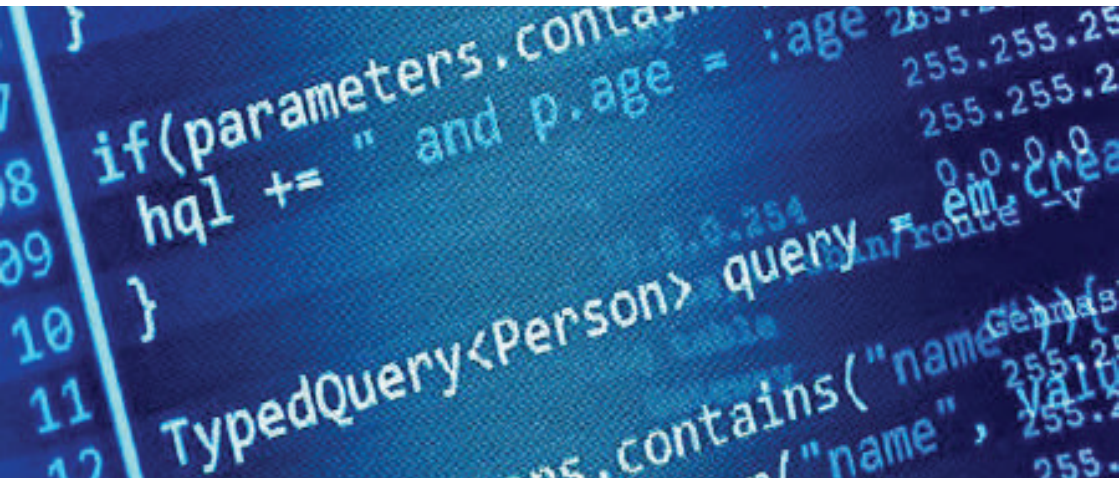
principles. As an interdisciplinary field, data science uses scientific methodologies, processes, and algorithms to gain insight into both structural and unstructured data. It also combines domain expertise, programming skills, and statistical knowledge.

The programme is designed to help graduate students master advanced practical principles of data science and its related courses, including machine learning, data mining, business intelligence, big data analytics, data management and their applications. It is a programme intended to prepare the student for a professional career and/or an advanced qualification in data science.

Some of the modules in the programme include Linear Algebra, Programming with R and Python, Statistical Methods, Machine Learning, Data Mining, Business Intelligence, Big Data Analytics, Data Management, Entrepreneurship, Research Methods in Computing, Supervised Research and Dissertation.

9, MSc IN COMPUTER SCIENCE

The course aims at producing high calibre graduates equipped with advanced knowledge and practical skills in computer science which enable them to solve computing problems in a variety of contexts, including the industry





and research in the field of computer science. The programme is designed to help the graduate student master advanced practical principles of computer science and its sub-branches, including software engineering, database systems, human-computer interaction, artificial intelligence, networking, operating systems, data structures and algorithms and their applications. Graduates from the programme will be capable of using and applying contemporary technical concepts and practices in core computing and information technologies, analyzing various problems and identifying and defining computing requirements appropriate to their solutions, and designing, implementing and evaluating computer-based systems, processes, components, and programmes.

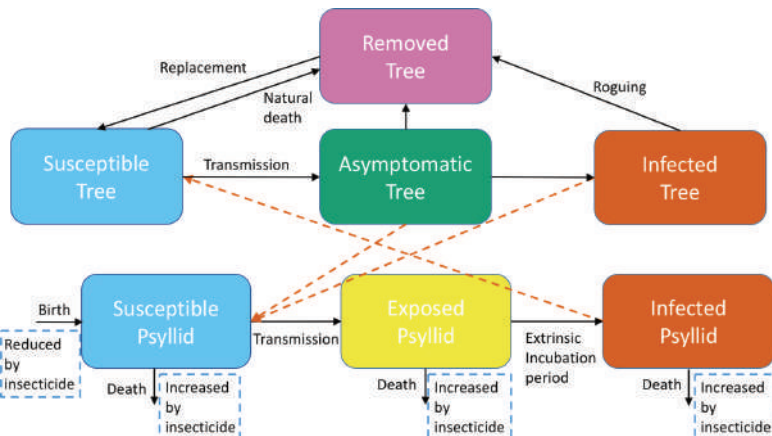
Some of the modules in the programme include Research Methods in Computing, Entrepreneurship, Databases, Data Mining & Warehousing, Computer Graphics & Multimedia, Data Structures, Algorithms & Computability, Internet of Things, Artificial Intelligence, Software Engineering, Cryptology, Information Security, and Supervised Research and Dissertation.

10, MBA IN BUSINESS LEADERSHIP

Business leadership is the capacity of a

manager to set and attain challenging goals, take fast and decisive action when needed, outperform external competition, overcome threats, and inspire others to perform at the highest level they can in order to achieve set goals. Business leadership therefore prepares business professionals to take on business leadership roles required to drive organizational change in an increasingly complex and competitive world of modern corporations. Business leadership skills are required in almost all types of organizations for purposes of people management, strategic thinking, and organization communication among others.

Students will spend first year doing taught modules in areas of Leadership Development, Leading People in Business, Strategic Information Management, Managerial Economics, Strategic Financial Management, Research Project Skills I, Strategic Marketing Management, Strategic Human Resource Management, Entrepreneurship and Innovation, Corporate Strategy, Strategic Business Leadership Project, Research Project Skills II with electives from Financial Reporting and Analysis, Commercial Law, International Business, Business Ethics and Corporate Governance, Strategic Change Management, and Industrial Relations. Second year is for thesis writing.



computing, Stochastic Differential Equations with Applications, Life Insurance Mathematics and Modelling, Financial Mathematics and Modelling, Fluid Dynamics and Modelling, Innovation/Entrepreneurship, Advanced Research Methods, and Research in any one of the following areas: Mathematical epidemiology,

11, MSc IN MATHEMATICAL MODELLING

Models are becoming an increasingly important tool in many branches of modern society due to advances in science and technology. Mathematical modelling is a cyclical process in which real-life problems are translated into mathematical language, solved within a symbolic system, and the solutions tested back within the real-life system. It is a specific branch of mathematics that deals with practical methods as they are applied to specific fields. Students should expect to study topics examining how mathematics relates to fields as diverse as finance, insurance, business, and healthy sciences. They may also learn to apply mathematics principles to practical problems by studying and formulating mathematical models that answer questions relating to economics, health, ecology and computer sciences.

Some of the modules studied in this programme include: Non-life Insurance Mathematics and Modelling, Mathematical Epidemiology: Deterministic Models, Probability & Statistical Theory, Mathematical Computing, Dynamical Systems, Computer programming, Statistical

Stochastic modelling, Ecological mathematics, Insurance mathematics, Financial mathematics, Fluid dynamics, and Numerical analysis. Second year is for dissertation writing.

12, MSc IN INNOVATION

Many specialists have predicted that innovation will be the main paradigm shifter in the quest to keep the world competitive. The creators of innovations must tune up their



linear programming, continuous modelling, numerical analysis, statistics, information theory, game theory, etc.

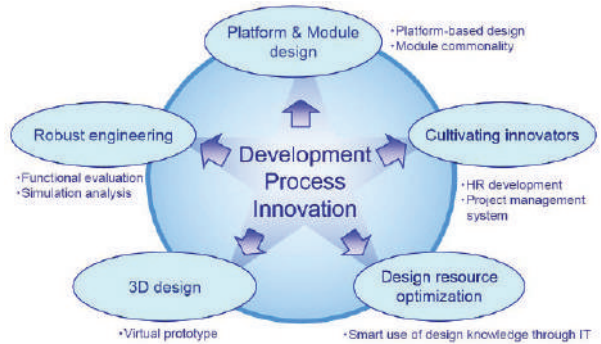
The current doctorate programme enables students to conduct advanced research for application in the fields of Engineering, Medicine, Physics, Biology, and Computer Sciences under the supervision of advisors. The need for experts to analyze data gathered to gain appropriate qualifications in line with international standards and use of these qualifications is increasing day by day in this new information age. For this reason, mathematical and statistical analyses have become an indispensable element for various industries. The PhD students will be able to conduct the research in Mathematical Epidemiology, Deterministic modelling, Stochastic modeling, Ecological modeling, Fluid dynamics modelling, Insurance modeling, and Financial modeling.

15, PhD BUSINESS LEADERSHIP

This is a research-based programme geared towards providing managers with specialist expertise in the field of business leadership in order to facilitate and promote decision-making of the highest standard, the continual development of a high level of cognitive knowledge, skills and attitudes and excellent managerial development in various organizations. The programme will ultimately provide the current research to contribute towards the development and understanding of a specific field of interest in general management to enhance business leadership skills.

The PhD degree will offer an opportunity to interface business industry and address challenges in industrial development in the prevailing national, regional and global environments. It will further provide an opportunity to practising managers to investigate the ongoing practices in their organisations and develop new contextual theories, or theories that will compliment those built around the practices of the

organisations in more developed markets.



16, PhD IN INNOVATION AND DEVELOPMENT

The world is facing several challenges including population growth, environmental degradation, conflicts, health related challenges and increased poverty, especially in developing countries. But the use and application of innovation tools and concepts for development is very limited. One of the components of transformational development is the use of digital technologies. However, such opportunities have not been used in most developing countries to translate challenges into economic opportunities. Addressing current and future development challenges will require a new set of skills, critical thinkers and development oriented human resources that will use technologies as a vehicle for short- and long-term solutions.

Furthermore, the knowledge exchange enhanced through this PhD programme is the new mantra in the current university-industry discourse. As universities are encouraged to contribute to the national development agenda through production and distribution of new knowledge, the need for linking up with industry cannot be overemphasised. The programme will therefore produce experts to contribute to the understanding of the influence of government and interest groups in making collective developmental decisions, and the role of innovations in advancing performance of different forms of policy interventions in different contexts.



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