Mawhiba Universal Entertainment Program Courses
Female program - 2025

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Courses descriptions:

1. Medical & Surgical Sciences I (Foundation):

The Medical & Surgical Sciences (Foundation) course is designed to introduce students to the fascinating world of medicine, surgery, and practicing as a doctor. You will learn about core human anatomy, including the cardiac, respiratory, and musculoskeletal systems, and how they function together. The course will cover important topics such as anatomy, how diseases affect the body (pathology), the basics of how medications work (pharmacology), and the fundamentals of different types of medical examinations.

We will explore the body by looking at different regions, focusing on how cells and tissues make up organs like the skin, bones, and nervous system. You will also learn about common diseases and what they mean for health on a societal level. Through engaging classroom activities, fun simulations, and hands-on experiments in the lab, you will have the chance to apply what you've learned in a friendly and interactive way. Additionally, we will discuss how medicine relates to macro-scale global health trends, as well as how technology is changing the field.

By the end of this course, students will be able to:

- Identify different organs in the body and understand their basic functions.

- Describe how organs work together and their importance in health.
- Recognize the relationship between the architecture of the human body and its function.
- Understand how different medications affect different parts of the body.
- Practice basic skills used in healthcare settings, such as clinical examinations.
- Appreciate the role of medicine in society and its global effects.
- Imagine what the future of medicine might look like.
- Consider if a career in medicine could be a good fit for them.

2. Medical & Surgical Sciences II (Intermediate):

The Medical & Surgical Sciences (Intermediate) course is designed to give you a strong taste of medical school, and to make the next generation of students familiar with the structure, composition and functions of the organ systems of the human body. You will experience the core disciplines taught at medical school including anatomy, pathology, physiology, biochemistry, and pharmacology, as well as basic medical examinations and surgical techniques. The structure and organization of the course are based on a regional approach to the study of the human body. Thus, we will consider the basic concepts and essential details of the structure and function of cells, tissues, and the integumentary, skeletal, muscular, cardiovascular system, respiratory system, nervous system, and renal system, as well as common human disease processes. Through interactive classroom lectures, virtual medical science simulations, and on-campus laboratory experiments, attendees will experience an interactive learning environment where they put into practice all of the knowledge they have acquired. Students will also explore medicine in the context of global health, novel treatment paradigms, and digital health, and how research in these areas is influencing the medical landscape. Students will learn the functional aspects of different medical and surgical specialties and their clinical importance, which will be particularly relevant to their own career planning.

After taking this course, students will be able to:
- Relate to different types of organs inside the body from physiological and pathological perspectives.

- Explain the functions of the different organs and their relevance to clinical practice.

- Compare and contrast the connection between the physiological and the anatomical factors of the human body.

- Demonstrate the underlying mechanism of action of drugs on different human organs.

- Acquire practical skills used by doctors in the clinical setting (e.g., clinical examination, suturing)

- Understand the individual and societal impact of medicine on the global stage.

- Envisage the future of medical and surgical practice.

- Have a sense of whether a career in medicine might be right for them.

3. Medical & Surgical Sciences III (Advanced):

The Medical & Surgical Sciences (Advanced) course builds upon foundational basic science knowledge and its application to clinical medicine. Students will review the major organ systems of the human body, including the integumentary, musculoskeletal, cardiovascular, respiratory, central nervous, and renal systems. This will include a detailed look at their clinical anatomy and physiology, alongside the pathology of common human disease processes. Students will perform a deeper dive into biochemistry, pharmacology, and biotechnology, to learn about common drugs doctors use and more cutting-edge therapeutics currently under development. They will also further their knowledge of medical examinations and more advanced surgical techniques. Students will explore medicine in the context of global health, novel treatment paradigms, and digital health, and how research in these areas is influencing both clinical practice and the wider medical landscape. Students will explore the different medical and surgical specialties offered at the postgraduate level and reflect upon the essential steps to medical school and qualifying as a doctor. The course will be delivered through a combination of interactive classroom lectures, virtual medical science simulations, and on-campus laboratory experiments. All students will experience an engaging and interactive learning environment where they will have ample opportunity to put into practice all of the knowledge they have acquired.

After taking this course, students will be able to:
- Understand organ function and disease.

- Understand drug mechanisms and disease management.

- Acquire practical skills used by doctors in the clinical setting (e.g., clinical examination, suturing)

- Understand the importance of global health and the impact medicine has on society.

- Anticipate future advancements in medical and surgical practice, including the integration of digital health and AI.
- Project themselves into the day-to-day lives of working doctors and surgeons and gain some sense of whether medicine might be the correct career path for them.

4. Biotechnology & Biomedical Engineering:

This comprehensive course delves deeply into biotechnology and biomedical engineering, offering students immersive experience in the latest scientific advancements and their practical applications. It covers a broad spectrum of topics, including the intricacies of bioinformatics, the engineering processes behind bioproduction, and the cutting-edge field of biorobotics. You will explore how biotechnology is revolutionizing healthcare through developments in stem cell therapy, vaccine production, and novel drug delivery systems. The course also emphasizes the transformative impact of biomaterials and tissue engineering in advancing surgical techniques and patient care. A significant focus is placed on the process of turning laboratory breakthroughs into viable commercial products. Moreover, students will have the opportunity to initiate and develop their biotechnology projects, gaining valuable insights into the entrepreneurial aspects of the biotech industry. This course is meticulously

designed for those passionate about the nexus of medicine, healthcare technology, biomedical innovation, and business acumen in the biotech sector.

After taking this course, students will be able to:

- Understand the broader fields of biotechnology and biomedical engineering, including foundational knowledge across various subfields including bioinformatics, bioprocess engineering, and biorobotics

- Comprehend the practical application of theoretical concepts, and how scientific discoveries in biotechnology are transformed into commercial healthcare products.

- Develop and execute their own practical biotechnology projects.

- Gain insight into biotech entrepreneurship, including funding, marketing, and commercialization strategies.

- Understand the social impact of biomedical advances.

- Appreciate the integration of biotechnology with other technologies (e.g. AI, robotics, Big Data)

- Survey different career possibilities within the larger fields of biotechnology and biomedical engineering and have a sense of whether a career in one of these domains might be right for them.

5.Neuroscience & Clinical Psychology:

This course focuses on two increasingly important modern-world disciplines, namely neuroscience and psychology. Students will initially be introduced to the psychobiological basis of sensing, responding, emotion, language, learning and memory, before progressing onto psychological disorders. This will be supplemented by teaching on the foundations of neuroscience at the cellular and molecular level, alongside cognitive and behavioural neuroscience. Students will gain an informed understanding of the anatomical organisation of the nervous system, electro-chemical neuronal activity and how these circuits underpin stimulation, response and elicited behaviours. Students will then study modern psychology in a wider intellectual and historical context, and eventually progress to real-world clinical applications, examining current research, theoretical implications and data integration.

After taking this course, students will be able to:
- Understand the basic concepts of neuroscience and psychology, including the key components of sensing, responding, emotion, language, learning, and memory.
- Identify and describe common psychological disorders and their underlying psychobiological mechanisms.
- Explain the anatomical organization of the nervous system and the role of electro-chemical neuronal activity in behavior and response.
- Analyze the relationship between cognitive processes and behavioral responses through the lens of cognitive and behavioral neuroscience.
- Evaluate current research and theoretical implications in psychology, applying this knowledge to real-world clinical scenarios.

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6.Aerospace and Rocket Engineering:

This course provides a solid and holistic understanding of aerospace and rocket engineering through three content clusters: 1. Fundamental physics and mathematical foundation of the field; 2. Aerodynamics, orbital mechanics, and rockets; and 3. Space environment, payload and satellites. Students will learn about the theoretical and practical applications of this cutting-edge field, alongside the study of real-world cases, institutions, and organizations e.g., NASA and SpaceX. The course will help students develop an understanding of the space environment and space operations, alongside the principles underpinning space technology and satellite communications. Teaching will be delivered through tutorials, workshops, and practical sessions. It is particularly suitable for students who wish to acquire skills in this field and for those interested in studying it as their university major.

After taking this course, students will be able to:

- Understand core principles and theoretical underpinnings of rockets, flight, and aerospace science.
- Identify and weigh key factors affecting space exploration by analyzing case studies.
- Apply meaningful theoretical concepts and trade-off decision capability to solve problem scenarios.
- Design, execute and refine practical exercises and computer lab simulations involving projectile motion and flight design.
- Critically reflect on the ethics of space exploration and understand future prospects of the field.

7. Global Health and Health Technology:

Global Health and Technology examines the challenges of providing equitable healthcare globally and the role of innovative solutions in addressing these issues. The course covers key biomedical foundations, such as an introduction to human physiology, disease mechanisms, and principles of diagnostics, providing a context for understanding health technologies. With this foundation, the course then take a deep dive into topics such as global health disparities, the basics of epidemiology, and how technologies like telemedicine and AI-driven diagnostics can bridge healthcare gaps. Using case studies, hands-on experiments and dataset visualizations, participants will develop a foundational understanding of how technology can address pressing global health challenges and the critical thinking skills needed to assess their effectiveness.

After taking this course, students will be able to:

- Analyze how emerging technologies like telemedicine and AI diagnostics are transforming healthcare delivery in different global contexts, using specific case studies as evidence.

- Explain fundamental concepts in human physiology, disease mechanism and epidemiology and how they relate to current global health challenges and technological solutions.

- Compare healthcare systems across different countries, examining how technology adoption impacts healthcare access and outcomes.

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- Design a basic framework for assessing the ethical implications of implementing new health technologies in resource-limited settings.

8. Sustainable Engineering:

This course is designed to equip students with a comprehensive understanding of sustainable energy within the evolving fields of materials, electrical, and environmental engineering. Students will explore critical topics like decarbonization, zero emissions, and renewable energy solutions, supported by real-world case studies and practical applications all framed within the context of sustainability and green energy. The curriculum also integrates discussions on policy, entrepreneurship, artificial intelligence, and the ethical implications of engineering innovations, making it an ideal course for students aiming to explore opportunities in sustainable energy and modern engineering practices.

After taking this course, students will be able to:

- Understand the basic types of renewable energy sources like solar, wind, and hydropower, and explain how each one works to generate electricity for our everyday needs.
- Explore why climate change is happening and how switching to sustainable energy sources can help reduce harmful emissions that affect our environment.
- Learn how different materials and simple electrical systems work together in renewable energy technologies, using hands-on experiments and real-world examples.
- Investigate local and global examples of sustainable energy projects, discovering how communities are making the switch to cleaner energy sources and what challenges they face.
- Design and evaluate simple sustainable energy solutions for everyday problems, considering factors like cost, environmental impact, and practicality.

9. AI & Big Data:

This course will introduce students to the major topics with the exciting, cutting-edge domains of artificial intelligence and Big Data, including machine learning algorithms, neural networks, deep learning, data acquisition and storage, and the cleaning and preparation of data. Students will explore different industrial applications of AI and Big Data, with specific attention paid to critical case studies, including healthcare and finance. Students will also engage in ethical debates that surround the development of strong AI. You will learn the design principles of AI and machine learning systems and learn to code and debug basic systems yourself. You will also learn techniques for the effective visualization and interpretation of large datasets, and about different career possibilities within the fields of AI & Big Data.

After taking this course, students will be able to:

- Describe different forms of AI, their strengths and weaknesses, and their industrial and real-world applications.

- Describe different Big Data techniques and applications.

- Provide a functional definition of algorithms and write basic algorithmic code.

- Understand how to prepare datasets for analysis.

- Code and debug basic AI software.

- Know a variety of techniques for the visualization and interpretation of large datasets.

- Reflect critically on the ethical questions regarding the development of strong AI, and the increasing deployment of AI across a number of industries and domains of everyday life.

- Project themselves into the day-to-day life of AI & Big Data professionals in a number of different domains and have a sense of whether a career in AI & Big Data is right for them.

10. AI & Big Data in the Biomedical Sciences:

AI in the Biomedical Sciences will introduce students to the major topics of artificial intelligence (AI) and Big Data, including machine learning algorithms, neural networks, deep learning, data acquisition and storage, and the cleaning and preparation of data. In addition to these core topics, the course will dedicate at least 9 hours specifically to AI applications in the biomedical sciences, covering areas such as medical imaging, genomics, personalized medicine, drug discovery, and AI-driven diagnostic tools. Students will also engage in ethical debates surrounding the development of strong AI and its implications for healthcare. They will learn the design principles of AI and machine learning systems and gain hands-on experience coding and debugging basic systems. Additionally, the course will cover techniques for the effective visualization and interpretation of large biomedical datasets, helping students understand how AI is revolutionizing research and clinical practice in the biomedical field.

After taking this course, students will be able to:

- Explain the fundamental concepts of artificial intelligence, including machine learning, neural networks, and deep learning, using biomedical examples to demonstrate their understanding

- Analyze and evaluate ethical considerations surrounding AI applications in healthcare, for example patient privacy, bias in medical algorithms, and the role of AI in clinical decision-making.

- Deploy basic coding skills to create and debug simple machine learning algorithms, applying these skills to solve straightforward biomedical data problems.

- Demonstrate the ability to clean, prepare, and visualize datasets, showing how raw data can be transformed into meaningful insights for healthcare applications.

- Describe how AI technologies are currently being applied in specific areas of biomedicine, such as medical imaging, genomics, and drug discovery, and assess their potential impact on future healthcare delivery.

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11. Computer Science for a Digital Future:

In an increasingly interconnected world, computer science is a key area for almost every industry and has roots in both mathematics and engineering. This course will explore the relevant mathematical principles, computer architecture, data structures and algorithms underpinning computer science, and how they are driving the "digital future". Hot topics in the digital future span virtual reality, AI, data science, and machine learning. Digital technology is supporting the development of everything from autonomous ("driverless") cars to Fintech banks, surgical robots, and augmented gaming. This course exposes students to a range of digital technologies and the computer science that underpins them from theoretical, methodological, and practical perspectives. The course will be delivered through interactive tutorials, workshops, and practical sessions, and is suitable for students who wish to acquire skills related to software engineering, software applications, AI, computer science, and the tech jobs of the future. Particular emphasis will be directed towards programming languages, as well as practical work with programmable robotic technology.

After taking this course, students will be able to:

- Code and debug their own programs.

- Explain what kinds of programming approaches are used across the variety of cutting-edge technological fields described above.

- Understand how programmers code machine learning and AI software.

- Navigate different cutting-edge computer scientific fields with confidence and plan their own careers in any of these domains from an informed perspective.

12.Economics, Finance & Investment Essentials:

This course introduces students to key financial and economic concepts through the lens of entrepreneurship and startups, combining mathematical and economic disciplines. Covering both micro and macroeconomics, students will learn about market fundamentals, financial modelling, risk management, and entrepreneurial finance, including venture funding, fintech, and cryptocurrencies. The course also explores trading, investment decisions, and the application of new technologies in financial markets. Additionally, it examines the societal impacts of economics, such as sustainable development and public policy. Ideal for those aspiring to careers in finance, business, and public policy, the course offers a practical focus on real-world financial applications and entrepreneurial strategy.

After taking this course, students will be able to:

- Explain key terms and concepts in microeconomics
- Analyse how macroeconomic factors like interest rates, inflation, and government policies impact business decision-making and market dynamics
- Design a basic financial model to project revenues and costs for a startup business, incorporating key economic principles and market analysis

- Evaluate different funding options for new ventures, including traditional venture capital, crowdfunding, and cryptocurrency-based financing
- Calculate risk-adjusted returns for various investment opportunities using fundamental mathematical and statistical concepts

Develop a sustainable business strategy that balances profit objectives with environmental and social responsibility goals

13. Architectural Engineering:

This course offers a comprehensive and exciting exploration into architectural engineering within national, regional, and international contexts. It delves deep into the core principles of the field, elucidating the historical contexts and the cultural influences that have shaped architecture styles and engineering methods, offering an engagement with architecture as both an art and a science. Beyond theoretical study, the curriculum emphasizes practical engagement. You will engage in architectural sketching and model-making, with and without computers, and also investigate the pragmatic aspects of architecture, examining its intersection with engineering principles, environmental considerations and technological advancements. You will discuss and debate questions around the adaptation of traditional design techniques to modern sustainable practices, climatic challenges, and innovative technologies and materials utilized in contemporary architecture. Through discussions, empirical analysis, and practical projects, students will gain a nuanced understanding of how architectural engineering reflects and actively shapes cultural identities and societal values.

After taking this course, students will be able to:

- Understand core principles and theoretical underpinnings of architectural engineering.
- Assess and balance key factors affecting architectural design and engineering methods in specific environments by analyzing case studies.
- Apply meaningful theoretical concepts and architectural principles to solve problem scenarios involving resource allocation.
- Draft and design selected architectural structures through sketching and modelmaking, with acute consideration of their social and cultural impact.
- Critically reflect on the ethics of architectural engineering, sustainable architecture, and environmental concerns, and understand future prospects of the field.

- Survey career paths within the broader field of architecture and architectural engineering and evaluate whether these might make for a good fit.