



**In Partnership With Diversity Learning Institute-DLI & Twikatane e.V Vermany**

**Bachelor of Science in Anatomy & Human Biology (B.Sc. AHB)  
Leading to Medicine and Medical Studies**

**Semester 1:**

Module Name	Module Code	Teaching Hours	Credits
Introduction to Anatomy & Human Biology	AHB101	45	3
Cell Biology	AHB102	60	4
Chemistry for Life Sciences	AHB103	45	3
Mathematics for Life Sciences	AHB104	45	3
Medical Terminology	AHB105	30	2
Introduction to Physiology	AHB106	45	3
Anatomy Lab I	AHB107	45 (Lab)	2

**Semester 2:**

Module Name	Module Code	Teaching Hours	Credits
Anatomy of the Skeletal System	AHB201	45	3
Histology	AHB202	60	4
Biochemistry for Life Sciences	AHB203	45	3
Genetics and Molecular Biology	AHB204	45	3
Physiology of the Muscular System	AHB205	45	3
Anatomy Lab II	AHB206	45 (Lab)	2

**Semester 3:**

Module Name	Module Code	Teaching Hours	Credits
Anatomy of the Nervous System	AHB301	45	3
Embryology	AHB302	60	4
Pharmacology	AHB303	45	3
Immunology	AHB304	45	3
Physiology of the Cardiovascular System	AHB305	45	3
Anatomy Lab III	AHB306	45 (Lab)	2

**Semester 4:**

Module Name	Module Code	Teaching Hours	Credits
Anatomy of the Respiratory System	AHB401	45	3
Neuroanatomy	AHB402	60	4
Microbiology for Life Sciences	AHB403	45	3
Endocrinology	AHB404	45	3
Physiology of the Respiratory System	AHB405	45	3
Anatomy Lab IV	AHB406	45 (Lab)	2

*The pattern continues for subsequent semesters and modules.*

**Semester 5-8:** The later semesters would cover more advanced topics in anatomy, human biology, and related medical sciences, including specialized areas such as pathology, radiology, and clinical applications. Each semester may include relevant laboratory work, clinical rotations, and a research project or thesis.

**Semester 5:**

Module Name	Module Code	Teaching Hours	Credits
Pathophysiology	AHB501	45	3
Clinical Anatomy	AHB502	60	4
Diagnostic Imaging in Medicine	AHB503	45	3
Neurophysiology	AHB504	45	3
Research Methods in Anatomy & Human Biology	AHB505	45	3
Anatomy Lab V	AHB506	45 (Lab)	2

**Semester 6:**

Module Name	Module Code	Teaching Hours	Credits
Gastrointestinal Anatomy	AHB601	45	3
Renal and Urological Anatomy	AHB602	60	4
Clinical Pathology	AHB603	45	3
Cardiac Physiology	AHB604	45	3
Elective 1	AHB605	45	3
Anatomy Lab VI	AHB606	45 (Lab)	2

**Semester 7:**

Module Name	Module Code	Teaching Hours	Credits
Musculoskeletal Anatomy	AHB701	45	3
Reproductive Anatomy	AHB702	60	4
Medical Ethics and Law	AHB703	45	3
Clinical Elective	AHB704	45	3
Elective 2	AHB705	45	3
Anatomy Lab VII	AHB706	45 (Lab)	2

**Semester 8:**

Module Name	Module Code	Teaching Hours	Credits
Advanced Topics in Anatomy & Human Biology	AHB801	45	3
Clinical Rotation	AHB802	240 (Clinical)	8
Thesis or Research Project	AHB803	120	6

**Elective Modules:**

1. AHB605 - Forensic Anatomy
2. AHB705 - Pediatric Anatomy and Development
3. (Additional electives may be offered based on the program's curriculum.)

*Note: The clinical rotation may involve practical experience in a medical setting, allowing students to apply their knowledge in real-world scenarios. The thesis or research project is designed to give students an opportunity to conduct independent research in a specific area of anatomy or human biology.*

## Semester 1: Modules

### 1. Introduction to Anatomy & Human Biology:

- Overview of the human body structure and function.
- Introduction to anatomical terminology.
- Basic understanding of human biology principles.

### 2. Cell Biology:

- Study of cellular structure and function.
- Exploration of cellular processes, including cell division and metabolism.
- Emphasis on the relevance of cell biology to human anatomy.

### 3. Chemistry for Life Sciences:

- Introduction to basic principles of chemistry relevant to life sciences.
- Understanding the chemical basis of biological processes.

### 4. Mathematics for Life Sciences:

- Application of mathematical concepts to life sciences.
- Mathematical tools and techniques used in biological research and analysis.

### 5. Medical Terminology:

- Introduction to the language used in the medical field.
- Understanding and using terminology related to anatomy and human biology.

### 6. Introduction to Physiology:

- Overview of physiological processes in the human body.
- The connection between structure (anatomy) and function (physiology).

These modules collectively provide a foundational understanding of anatomy, biology, and related disciplines. Students will gain a solid introduction to the fundamental concepts that serve as a basis for more specialized and advanced courses in later semesters. This semester appears designed to establish a strong groundwork in both biological and foundational sciences essential for a degree in Anatomy & Human Biology.

## Anatomy Lab I:

- **Hands-on Dissection:** Practical sessions involving the dissection of cadavers or anatomical models.
- **Identification of Structures:** Students will learn to identify and study various anatomical structures in the human body.
- **Supervised Exploration:** Conducting guided explorations of anatomical specimens to reinforce theoretical knowledge gained in other modules.
- **Use of Lab Equipment:** Familiarization with and utilization of laboratory equipment relevant to anatomy studies.
- **Safety Protocols:** Training in laboratory safety measures and proper handling of specimens.

The anatomy lab complements the theoretical knowledge gained in modules like "Introduction to Anatomy & Human Biology" and "Cell Biology" by providing students with hands-on experience. This practical component is crucial for understanding the three-dimensional structure of the human body and its various systems. Students often develop skills in observation, dissection techniques, and teamwork, which are valuable for future studies and professional endeavors in the field of anatomy and human biology.

## **Semester 2**

### **1. Anatomy of the Skeletal System:**

- In-depth study of the human skeletal system, including bones, joints, and connective tissues.
- Identification of major bones and their landmarks.
- Understanding the function and role of the skeletal system in human anatomy.

### **2. Histology:**

- Continued exploration of tissues at the microscopic level.
- Detailed study of different cell types and structures within tissues.
- Emphasis on the microscopic anatomy of organs and their functions.

### **3. Biochemistry for Life Sciences:**

- Building on the foundation from the previous semester, this module covers biochemistry principles relevant to life sciences.
- Study of biomolecules, enzymatic reactions, and metabolic pathways.
- Application of biochemistry concepts to human biology.

### **4. Genetics and Molecular Biology:**

- Examination of genetic principles at the molecular level.
- Study of DNA structure, replication, transcription, and translation.
- Introduction to genetic engineering and biotechnology.

### **5. Physiology of the Muscular System:**

- In-depth exploration of the muscular system and its physiological processes.
- Study of muscle contraction, energy metabolism, and muscle function.
- Connection between anatomy (muscular structure) and physiology.

### **6. Anatomy Lab II:**

- Building on the experiences of Anatomy Lab I, this module involves more advanced dissections and hands-on activities.
- Focus on the skeletal and muscular systems.
- Integration of anatomical knowledge gained from both semesters.

## **Semester 3 Modules:**

### **1. Anatomy of the Nervous System:**

- Detailed study of the central and peripheral nervous systems.
- Examination of the brain, spinal cord, and peripheral nerves.
- Identification and understanding of neurological structures and functions.

### **2. Embryology:**

- Exploration of the developmental processes from conception to the formation of organ systems.
- Study of embryonic structures and their transformations during fetal development.
- Understanding the basis of congenital abnormalities.

### **3. Pharmacology:**

- Introduction to the principles of pharmacology.
- Study of drugs and their effects on the human body.

- Consideration of how pharmaceuticals interact with physiological processes.

#### **4. Immunology:**

- Further exploration of the immune system.
- In-depth study of immune responses, including cellular and molecular components.
- Understanding the role of immunology in health and disease.

#### **5. Physiology of the Cardiovascular System:**

- Examination of the structure and function of the cardiovascular system.
- Study of the heart, blood vessels, and blood circulation.
- Understanding the physiological processes involved in cardiovascular health.

#### **6. Anatomy Lab III:**

- Advanced dissections and hands-on activities related to the nervous system, embryology, pharmacology, immunology, and the cardiovascular system.
- Integration of anatomical knowledge gained in previous semesters.

This semester builds on the foundation laid in the earlier semesters, expanding the knowledge base to include the nervous system, embryology, pharmacology, and cardiovascular physiology. The anatomy lab experiences continue to reinforce theoretical learning and provide practical skills in anatomical exploration.

### **Semester 4 Modules**

#### **1. Anatomy of the Respiratory System:**

- Detailed study of the structure and function of the respiratory system.
- Examination of the lungs, airways, and related structures.
- Understanding the mechanics of breathing.

#### **2. Neuroanatomy:**

- In-depth study of the anatomy of the nervous system, focusing on the structure and function of the brain.
- Exploration of neural pathways, brain regions, and their roles in controlling bodily functions.

#### **3. Microbiology for Life Sciences:**

- Study of microorganisms and their impact on human health.
- Examination of bacteria, viruses, fungi, and other microbes.
- Application of microbiological concepts to life sciences.

#### **4. Endocrinology:**

- Exploration of the endocrine system and hormonal regulation.
- Study of endocrine glands and their secretions.
- Understanding the role of hormones in physiological processes.

#### **5. Physiology of the Respiratory System:**

- In-depth exploration of respiratory physiology.
- Study of gas exchange, respiratory control, and the regulation of breathing.
- Integration of anatomical and physiological knowledge related to the respiratory system.

## 6. Anatomy Lab IV:

- Advanced dissections and hands-on activities related to the respiratory system, neuroanatomy, microbiology, endocrinology, and respiratory physiology.
- Integration of anatomical knowledge gained in previous semesters.

This semester further expands the understanding of human anatomy and physiology, with a focus on the respiratory and nervous systems, as well as microbiology and endocrinology. The anatomy lab experiences continue to enhance practical skills and reinforce theoretical learning.

## Semester 5 Modules:

### Module 1: Pathophysiology (AHB501)

1. Cellular Adaptations and Cell Injury
2. Inflammation and Repair
3. Genetic Disorders and Diseases
4. Immunopathology
5. Cardiovascular Pathophysiology
6. Respiratory and Renal Pathophysiology

### Module 2: Clinical Anatomy (AHB502)

1. Clinical Anatomy of the Head and Neck
2. Clinical Anatomy of the Thorax and Abdomen
3. Clinical Anatomy of the Pelvis and Perineum
4. Clinical Neuroanatomy
5. Radiological Anatomy in Clinical Practice
6. Case Studies in Clinical Anatomy

### Module 3: Diagnostic Imaging in Medicine (AHB503)

1. Principles of Radiological Imaging
2. X-ray and Computed Tomography (CT)
3. Magnetic Resonance Imaging (MRI)
4. Ultrasound and Nuclear Medicine
5. Interventional Radiology
6. Emerging Technologies in Medical Imaging

### Module 4: Neurophysiology (AHB504)

1. Neural Signaling and Synaptic Transmission
2. Sensory Systems and Perception
3. Motor Control and Movement
4. Autonomic Nervous System
5. Neurotransmitters and Neuromodulation
6. Neurological Disorders and Rehabilitation

### Module 5: Research Methods in Anatomy & Human Biology (AHB505)

1. Research Design and Methodology
2. Literature Review and Critical Analysis
3. Data Collection Techniques
4. Statistical Analysis in Biomedical Research
5. Ethical Considerations in Research

## 6. Writing and Presenting Research Findings

**Module 6: Anatomy Lab V (AHB506)** Continuation of hands-on laboratory sessions to reinforce anatomical knowledge and practical skills related to the topics covered in the semester.

### Semester 6 Modules

#### **Module 7: Gastrointestinal Anatomy (AHB601)**

1. Anatomy of the Digestive Tract
2. Liver, Pancreas, and Gallbladder Anatomy
3. Neuroanatomy of the Gastrointestinal System
4. Gastrointestinal Development and Congenital Anomalies
5. Gastrointestinal Diseases and Clinical Correlations
6. Surgical Anatomy in Gastrointestinal Procedures

#### **Module 8: Renal and Urological Anatomy (AHB602)**

1. Anatomy of the Kidneys and Urinary Tract
2. Physiology of the Renal System
3. Urological Disorders and Clinical Correlations
4. Renal and Urological Imaging
5. Transplantation Anatomy
6. Surgical Approaches in Renal and Urological Procedures

#### **Module 9: Clinical Pathology (AHB603)**

1. Introduction to Clinical Pathology
2. Hematology and Blood Disorders
3. Clinical Biochemistry and Metabolic Disorders
4. Microbiology and Infectious Diseases
5. Histopathology and Diagnostic Pathology
6. Molecular Pathology and Genetic Testing

#### **Module 10: Cardiac Physiology (AHB604)**

1. Cardiac Anatomy and Development
2. Electrophysiology of the Heart
3. Cardiac Cycle and Hemodynamics
4. Cardiovascular Regulation and Homeostasis
5. Cardiac Imaging Techniques
6. Cardiac Pathophysiology and Clinical Correlations

**Module 11: Elective 1 (AHB605)** Students can choose from a list of elective modules based on their specific interests, such as Forensic Anatomy or other specialized topics.

**Module 12: Anatomy Lab VI (AHB606)** Continuation of hands-on laboratory sessions to reinforce anatomical knowledge and practical skills related to the topics covered in the semester.

*The pattern continues for subsequent semesters and modules.*

### Semester 7 Modules:

#### **Module 13: Musculoskeletal Anatomy (AHB701)**

1. Anatomy of the Musculoskeletal System
2. Joints and Articular Systems
3. Skeletal Muscle Physiology
4. Connective Tissues and Soft Tissue Anatomy
5. Clinical Correlations in Musculoskeletal Disorders
6. Orthopedic Surgery and Procedures

**Module 14: Reproductive Anatomy (AHB702)**

1. Male Reproductive Anatomy and Physiology
2. Female Reproductive Anatomy and Physiology
3. Reproductive Endocrinology
4. Fetal Development and Pregnancy
5. Reproductive Disorders and Infertility
6. Obstetric and Gynecological Procedures

**Module 15: Medical Ethics and Law (AHB703)**

1. Principles of Medical Ethics
2. Informed Consent and Patient Rights
3. Legal and Ethical Issues in Biomedical Research
4. Ethical Challenges in Clinical Practice
5. Bioethics and Emerging Technologies
6. Global Perspectives on Medical Ethics

**Module 16: Clinical Elective (AHB704)** Clinical rotations and electives in specialized areas of anatomy and human biology, providing practical experience in a medical setting.

**Module 17: Elective 2 (AHB705)** Students can choose from a list of elective modules based on their specific interests, such as Pediatric Anatomy and Development or other specialized topics.

**Module 18: Anatomy Lab VII (AHB706)** Continuation of hands-on laboratory sessions to reinforce anatomical knowledge and practical skills related to the topics covered in the semester.

**Semester 8 Modules****Module 19: Advanced Topics in Anatomy & Human Biology (AHB801)**

1. Advanced Neuroanatomy and Neurological Disorders
2. Advanced Topics in Cardiovascular Anatomy and Diseases
3. Advanced Musculoskeletal Anatomy
4. Emerging Technologies in Biomedical Imaging
5. Integrative Approaches in Anatomy and Human Biology

**Module 20: Clinical Rotation (AHB802)** Extended clinical rotations providing intensive practical experience in a medical setting, allowing students to apply their knowledge in real-world scenarios.

**Module 21: Thesis or Research Project (AHB803)** Independent research project or thesis, allowing students to contribute to the field of anatomy and human biology through original research.

*Note: The clinical rotation provides an opportunity for students to gain practical experience in various medical disciplines, reinforcing their clinical skills and understanding of real-world medical practices.*

Replace these values with the actual ones provided by your university. The curriculum presented here is an example, and the actual course content may vary based on specific program requirements and university guidelines.

**Semester 8 Semester:**

**Module 18: Anatomy Lab VII (AHB706)** Continuation of hands-on laboratory sessions to reinforce anatomical knowledge and practical skills related to the topics covered in the semester.

**Semester 9 Semester:**



**Module 22: Clinical Rotation II (AHB901)** Advanced clinical rotations and electives in specialized areas of anatomy and human biology, providing practical experience in a medical setting.

**Module 23: Elective 3 (AHB902)** Students can choose from a list of elective modules based on their specific interests, such as Advanced Imaging Techniques or other specialized topics.

**Module 24: Research Seminar (AHB903)** A seminar course where students present and discuss their ongoing research projects or literature reviews, fostering academic dialogue within the field.

#### **Semester 10 Semester:**

**Module 25: Advanced Topics in Medical Research (AHB1001)** In-depth exploration of cutting-edge research topics in anatomy, human biology, and related medical sciences.

**Module 26: Clinical Integration (AHB1002)** Integration of clinical knowledge with theoretical concepts, providing a comprehensive understanding of medical practices.

**Module 27: Thesis Defense and Presentation (AHB1003)** Preparation and defense of the thesis or research project, culminating in a formal presentation of findings.

**Module 28: Professional Development and Ethics (AHB1004)** Exploration of ethical considerations in medical research, professional development opportunities, and career pathways in the field.

**Note: The content and structure of the later semesters are designed to provide students with advanced knowledge, research skills, and a holistic understanding of anatomy and human biology, preparing them for further studies or careers in medicine and medical sciences.**

#### **Special Optional Module: AI in Anatomy & Human Biology**

##### **(1) How AI can be applied in this course:**

In the "AI in Anatomy & Human Biology" module, students will explore the applications of Artificial Intelligence (AI) in advancing anatomical and medical research, diagnostics, and healthcare. The module may cover the following areas:

##### **Medical Imaging Analysis:**

- Introduction to AI algorithms for analyzing medical images, including X-rays, CT scans, MRI, and histological slides.
- Applications of AI in detecting abnormalities, tumors, and anatomical structures from medical imaging data.

##### **Clinical Decision Support Systems:**

- Understanding how AI can support clinical decision-making in anatomy and human biology.
- Case studies on AI applications in diagnosing diseases, recommending treatment options, and predicting patient outcomes.

##### **Anatomy Education and Virtual Dissection:**

- Integration of AI in virtual dissection tools for anatomy education.
- Developing AI-driven simulations for interactive learning experiences.

##### **Drug Discovery and Development:**

- AI-driven approaches in drug discovery, target identification, and pharmaceutical research.
- Utilizing AI for predicting potential drug interactions and side effects.

##### **Genomic Data Analysis:**

- Applications of AI in analyzing genomic and molecular data for understanding genetic factors in diseases.
- Bioinformatics tools powered by AI for identifying patterns and correlations in large datasets.

**Personalized Medicine:**

- AI's role in tailoring medical treatments based on individual genetic makeup and physiological characteristics.
- Challenges and ethical considerations in implementing personalized medicine.

**(2) Advantages of applying AI in this course:**

**Enhanced Medical Imaging Interpretation:**

- AI improves the accuracy and efficiency of interpreting medical images, aiding in the early detection of abnormalities.

**Efficient Clinical Decision-Making:**

- AI assists healthcare professionals in making informed decisions by analyzing complex medical data and providing relevant insights.

**Interactive Anatomy Learning:**

- AI-powered virtual dissection tools enhance anatomy education, allowing students to explore and understand anatomical structures in a dynamic way.

**Accelerated Drug Discovery:**

- AI expedites the drug discovery process by analyzing vast datasets, identifying potential drug candidates, and predicting their efficacy.

**Precision in Genomic Medicine:**

- AI enables the identification of genetic markers and patterns, contributing to the development of personalized treatment plans.

**Improved Patient Care and Outcomes:**

- AI applications contribute to more personalized and effective healthcare, leading to better patient care and outcomes.

**Data-Driven Research Insights:**

- AI facilitates the analysis of large datasets, providing researchers with valuable insights into complex biological and medical phenomena.

**Innovation in Medical Sciences:**

- Exposure to AI fosters innovation in medical research and practice, positioning students at the forefront of technological advancements in healthcare.

By incorporating AI into the Anatomy & Human Biology curriculum, students gain valuable skills at the intersection of technology and medical sciences. This knowledge prepares them to leverage AI tools for advancing research, improving diagnostics, and contributing to the evolution of healthcare practices.