BIOMEDICAL SCIENCE PROGRAMME GUIDEBOOK
2008/2009
Personal Details

Name: 

Student Number: 

Address: 

Phone: 

Email: 

Emergency Contact: 

Medical Information: 

IMPORTANT

All students must be registered and have paid their fees.

If you have any problems or queries, please contact the Student Section.
1. FOREWORD
   • MESSAGE FROM THE DEAN
   • MESSAGE FROM THE DEPUTY DEAN

2. ACADEMIC CALENDER

3. ORGANIZATION CHART AND IMPORTANT CONTACTS
4. HISTORY OF THE FACULTY
5. BIOMEDICAL SCIENCE DEGREE PROGRAMME

6. FACULTY FACILITIES
7. CAMPUS FACILITIES

8. NOTES

Prepared by: Professor Dr. Mary Anne Tan Jin Ai, Dr. Chua Kek Heng, Mohd Azril M. Yusof
MESSAGE FROM THE DEAN

A very warm welcome to the Faculty of Medicine, University of Malaya.

I take this opportunity to congratulate all of you and welcome you to the Faculty of Medicine, University of Malaya. I am happy to note that the University of Malaya has been a favourite choice among those who wish to pursue their first degree in Biomedical Science.

The main aim of this guidebook is to provide details of the Biomedical Science course and curriculum for students. It has useful information on the facilities available in the Faculty and the Biomedical Science examination regulations.

Before you embark on the course, I would like to advice you to be focused in your studies. You need to find a proper strategy to manage your time well. Study hard, but at the same time, do take the opportunity to make full use of the excellent sports and recreational facilities that the university offers.

I want to stress that the Faculty of Medicine expects the highest level of discipline among the students. It is essential that students adhere to all rules and regulations of the University and the Faculty, as you are responsible for upholding the good name and reputation of the Faculty, as well as the University.

The members of the Faculty join me in wishing you every success in your studies. We hope you will enjoy your time here and that your studies will be rewarding and fulfilling.

PROFESSOR IKRAM SHAH ISMAIL
Dean
MESSAGE FROM THE DEPUTY DEAN

On behalf of the Faculty of Medicine and the whole academic members, I extend a very warm welcome to each and every one of you. As a faculty, we would like your education in this institution to be a rewarding and an enriching experience.

Being a student will take a good 3 to 4 years of your life depending on your programme. To obtain your chosen degree, you have to put in a lot of hard work powered by dedication, sacrifices, unwavering determination, perseverance and commitment to ensure you will graduate not only equipped with the knowledge but also the skill required of the course.

The skills that will be harnessed include good communication skills between you and your colleagues, your teachers and also those within the community. You will find that your teachers, seniors and friends are mentors in your quest to become good and ethical graduate thus be the best student you could possibly be. We hope the medical community will provide you the network to enable you to expand your horizon in the field. We want you to be curious about your programme. Everything that goes on in this institution is a learning opportunity.

We hope this guidebook can be used fully to your advantage in better understanding of the programme and the people entrusted to run it. The Dean’s office along with all its support groups will try to make your stay a memorable and a fruitful one.

Again, I wish you a warm welcome and I look forward to meeting each and every one of you over the next few years.

PROFESSOR DATIN HAMIMAH HJ. HASSAN
Deputy Dean for Undergraduate and Diploma Programme
**BIOMEDICAL SCIENCE PROGRAMME**

**ACADEMIC CALENDAR SESSION 2008/2009**

### SEMESTER I

<table>
<thead>
<tr>
<th>Event</th>
<th>Duration</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Orientation</td>
<td>1 week</td>
<td>29.06.2008 – 06.07.2008</td>
</tr>
<tr>
<td>Lectures</td>
<td>6 weeks</td>
<td>07.07.2008 – 17.08.2008</td>
</tr>
<tr>
<td>Mid Semester Break</td>
<td>1 week</td>
<td>18.08.2008 – 24.08.2008</td>
</tr>
<tr>
<td>Special Break</td>
<td>1 week*</td>
<td>27.09.2008 – 05.10.2008</td>
</tr>
<tr>
<td>Lectures</td>
<td>3 weeks</td>
<td>06.10.2008 – 26.10.2008</td>
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<tr>
<td>Revision</td>
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<td>27.10.2008 – 02.11.2008</td>
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<tr>
<td>Examination</td>
<td>3 weeks</td>
<td>03.11.2008 – 23.11.2008</td>
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Total: **26 weeks**

* Hari Raya Aidilfitri (1 & 2.10.2008)

** SEMESTER II **

<table>
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<tr>
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<tr>
<td>Mid Semester Break</td>
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<td>26.01.2009 – 01.02.2009</td>
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<tr>
<td>Lectures</td>
<td>10 weeks</td>
<td>02.02.2009 – 12.04.2009</td>
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<td>Examination</td>
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<td>20.04.2009 – 10.05.2009</td>
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Total: **19 weeks**

+ Chinese New Year Celebration (26 & 27.01.2009)

### SPECIAL SEMESTER

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<tr>
<td>Lectures and Examination</td>
<td>7 weeks</td>
<td>11.05.2009 – 01.07.2009</td>
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</table>
Organization Chart of the Undergraduate Section
Administration of Undergraduate & Diploma Programme
Faculty of Medicine, University of Malaya

DEAN
Professor Dr. Ikram Shah Ismail
Tel: 7949 2050
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Dr. Salmah Ismail

Dr. Chua Kek Heng

Dr. Azlina Ahmad Anuar

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Email: noremi@um.edu.my

Ms. Jauhar Lisa Junaidi

Ms Noremi Mahusin

Mr Mohd Hafzani Mat Lazim
Administrative Assistant
Tel: 03-7967 7525
## HEADS OF DEPARTMENTS

<table>
<thead>
<tr>
<th>Department</th>
<th>Head</th>
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<tbody>
<tr>
<td>Department of Anaesthesiology</td>
<td>Prof Chan Yoo Kuen</td>
</tr>
<tr>
<td>Department of Anatomy</td>
<td>Prof Normadiah Kassim</td>
</tr>
<tr>
<td>Department of Biomedical Imaging</td>
<td>Associate Prof Norlisah Mohd. Ramli</td>
</tr>
<tr>
<td>Department of Medical Microbiology</td>
<td>Prof Sazaly Abu Bakar</td>
</tr>
<tr>
<td>Department of Obstetrics &amp; Gynaecology</td>
<td>Prof Siti Zawiah Omar</td>
</tr>
<tr>
<td>Department of Ophthalmology</td>
<td>Associate Prof Mimiwati Zahari</td>
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<tr>
<td>Department of Orthorhinolaryngology</td>
<td>Associate Prof Rahmat Omar</td>
</tr>
<tr>
<td>Department of Orthopaedic Surgery</td>
<td>Prof Dato’ Tunku Sara Tunku Ahmad Yahaya</td>
</tr>
<tr>
<td>Department of Paediatrics</td>
<td>Prof Fatimah Harun</td>
</tr>
<tr>
<td>Department of Parasitology</td>
<td>Prof Rohela Mahmud</td>
</tr>
<tr>
<td>Department of Pathology</td>
<td>Prof Cheah Phaik Leng</td>
</tr>
<tr>
<td>Department of Pharmacology</td>
<td>Prof Mohd Rais Mustafa</td>
</tr>
<tr>
<td>Department of Pharmacy</td>
<td>Associate Prof Mohamed Ibrahim Noordin</td>
</tr>
<tr>
<td>Department of Physiology</td>
<td>Prof Ruby Husain</td>
</tr>
<tr>
<td>Department of Primary Care Medicine</td>
<td>Prof Khoo Ee Ming</td>
</tr>
<tr>
<td>Department of Psychological Medicine</td>
<td>Prof Mohamad Hussain Habil</td>
</tr>
<tr>
<td>Department of Medicine</td>
<td>Prof Wan Azman Wan Ahmad</td>
</tr>
<tr>
<td>Department of Molecular Medicine</td>
<td>Prof Onn Hashim</td>
</tr>
<tr>
<td>Department of Nursing Science</td>
<td>Associate Prof Rohani Arshad</td>
</tr>
<tr>
<td>Department of Rehabilitation Medicine</td>
<td>Dr Saini Jeffrey Freddy Abdullah</td>
</tr>
<tr>
<td>Department of Social &amp; Preventive Medicine</td>
<td>Prof Awang Bulgiba Awang Mahmud</td>
</tr>
<tr>
<td>Department of Surgery</td>
<td>Prof Azad Hassan Abdul Razack</td>
</tr>
</tbody>
</table>

## HEADS OF UNITS

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<thead>
<tr>
<th>Unit</th>
<th>Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Research Centre</td>
<td>Dr. Hj. Azizuddin bin Hj. Kamaruddin</td>
</tr>
<tr>
<td>Clinical Oncology Unit</td>
<td>Associate Prof Dr. Anita Zarina binti Bustam</td>
</tr>
<tr>
<td>Electron Microscopy</td>
<td>Associate Prof Dr Nazarina Abdul Rahman</td>
</tr>
<tr>
<td>Medical Biotechnology Laboratory</td>
<td>Dr. Sarni Mat Junit</td>
</tr>
<tr>
<td>Medical Education Research Development Unit (MERDU)</td>
<td>Prof. Dr. Christina Tan Phong Lay</td>
</tr>
<tr>
<td>Sports Medicine Unit</td>
<td>Associate Prof. Dr. Mohd Razif bin Mohd Ali</td>
</tr>
<tr>
<td>Trauma &amp; Emergency</td>
<td>Prof. Dr. David Choon Siew Kit</td>
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</tbody>
</table>
Vision
Centre of Excellence in Medicine

Mission
To provide excellent Health Care, Education and Research Programmes delivered with efficiency, sensitivity and enthusiasm.
History of the Faculty

1905

First Batch 1969

2005

History of the Faculty
Historical background

The University of Malaya was established on 8 October 1949 as a national institution to serve the higher educational needs of the Federation of Malaya and Singapore. In 1960, the Government of the Federation of Malaya indicated that the Kuala Lumpur Division of the University of Malaya should become the national university in the Federation with effect from the beginning of the 1962/63 session. Likewise, the Singapore Division would become the National University of Singapore. Steps to achieve the establishment of these two separate universities were finalized in 1961 and the University of Malaya was established on the 1st of January 1962. The student population at that time numbered 330. Since then, the University of Malaya has grown and developed rapidly. Today, the student population numbers almost 30,000.

Establishment of the Faculty of Medicine at the University of Malaya

Till the 1950’s, the Faculty of Medicine, at the University of Singapore, which was known previously as the King Edward VII College of Medicine, had been the only medical school in Malaya and Singapore. The output of doctors at that time was small: at 60 a year. Many Malaysians had to go overseas to pursue undergraduate medical education. It was not until 1960 that a determined effort was made to double the intake of students to 120 per year in Singapore. In 1960, a board of studies of the University of Malaya was appointed to consider the feasibility of establishing a medical school with its own teaching hospital. The board recommended the early establishment of both.

To this end, the Government agreed and the Ministries of Education and Health provided the necessary capital funds. In 1962, a Dean for the Faculty of Medicine was appointed.
The first batch of medical students was admitted to the Faculty in 1964. A year earlier, these students, 40 of them, had been studying in the Faculty of Science as pre-medical students. Construction of the medical faculty building began in July 1963, and was completed in 10 months, so that these pioneer students were able to begin their course in May 1964. Construction of the faculty buildings continued and the second phase was ready in time for Year II teaching the following May. Throughout this period, planning, building, ordering and receiving of equipment, recruitment of staff, organization of the Faculty, and discussions on the curriculum continued unremittingly. Phase I of the University Hospital (as it was known then) consisting of the main block together with podium or “technical box” (operating theatres, radio-diagnostic, accident and emergency, polyclinic, pharmacy, central sterile supply, cafeteria, administration and medical records) was completed in December 1966, and the first wards were opened in March 1967. Phase II of the hospital consisting of paediatric, maternity and rehabilitation units, was completed in December 1967, and became functional in March 1968. The total construction period for the medical centre, consisting of the Faculty departments, hospital (740 beds), and hostel for clinical students, nurses’ quarters with Nursing School and the Animal House, was three and a half years. Over the past three decades, the medical centre has expanded greatly, and today it has 900 beds; this number will be increased to 1200 beds after further renovation.

Philosophy of the Faculty of Medicine

The philosophy of the Faculty is to mould students to be competent, highly-skilled and knowledgeable professionals, who can work with others as a team, who are caring and concerned about their patients and society, and who can emerge as leaders in their community.

Orientation period

As part of the university orientation programme, all new students undergo an orientation period during which they are introduced to life on campus and in the residential colleges. In the Faculty of Medicine, the programme includes registration, briefings by the Dean & Deputy Dean, and a tour of the various academic facilities at the medical centre. Students will be given information about the activities of the faculty, facilities available at the faculty, as well their selected course content.

Students will also be introduced to the use of library services and the Student Information System.
1. INTRODUCTION

The Biomedical Science Programme spans a minimum period of 3 years. Initially, students are provided with a broad based knowledge of basic medical sciences, allowing students the chance to acquire basic medical laboratory skills. Subsequently students proceed to the specific study of medical laboratory disciplines of their own choice: Anatomic Pathology, Haematology, Transfusion Medicine, Clinical Chemistry, Medical Microbiology, Medical Parasitology, Medical Physiology, Medical Pharmacology, and Nuclear Medicine/Biomedical Imaging.

Students will learn the principles underlying the various analytical methods and investigatory procedures used in laboratory medicine, and obtain practical training to consolidate theoretical instruction. In addition, instruction is provided on research methodologies as students will be carrying out research projects of their own design during final year.

Successful graduates in biomedical science should be able to assume responsible positions in the following situations: (1) as part of a healthcare team that is concerned with the care of patients and/or with basic and applied clinical research; (2) as part of a research team in allied medical disciplines, in food and pharmaceutical industries, in public health, and in biotechnology. Career opportunities are wide ranging and include employment in clinical laboratory service departments, teaching institutions, and research centres in public as well as private sectors. Post-graduate training is strongly encouraged, either within the country or abroad, all towards attaining the goal of heightening the quality of science and medicine.

2. THE COURSE OBJECTIVES

The objectives of this course are to:

1. Produce laboratory oriented, technically competent graduates with a sound foundation in the basic medical sciences.
2. Produce graduates with in-depth knowledge of the major disciplines of biomedical science in order to fill the niches in medical support services, in ground-breaking frontier medical research, and in progressive scientific education.
3. Produce graduates equipped with all the soft skills to be competitive in the workforce.
4. Produce graduates with high ethical, professional, and moral standards needed to serve society and the nation.

3. OVERALL LEARNING OUTCOMES

At the end of the course the students are expected to have achieved learning outcomes outlined below:

(1) Relating to knowledge

Students shall be able to:

• describe the structure, function and normal development of the human body
• describe the histopathological structure of diseased tissue
• describe drug interaction and toxicity in the human body
• describe the aetiologies and laboratory diagnoses of diseases caused by microbiological and parasitical agents
• describe the diagnostic procedures of common diseases using all types of sample matrixes.
(2) Relating to skills

Students shall be able to:

- manage a diagnostic laboratory
- perform diagnostic tests for disease diagnosis
- communicate effectively with healthcare professionals and the public
- apply critical thinking and problem-solving approaches to learning
- gather information using current technology and adopting it to the study and practice of biomedical science.

(3) Relating to attitudes

The student shall:

- understand ethical standards in medical science research
- carry out work effectively as a team with other healthcare professionals
- apply independent, life-long learning
- be responsible to keep abreast of new development and their effects on biomedical research by a self-motivated programme of continuing professional development.
4. **ACADEMIC PROGRAMME STRUCTURE**

1. **A) Programme Structure (For Malaysian Students)**

<table>
<thead>
<tr>
<th>University Courses</th>
<th>16 Credit Hours</th>
<th>(15% of 110 hours)</th>
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<tbody>
<tr>
<td>TITAS (TWU)</td>
<td>2</td>
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<tr>
<td>Hubungan Etnik</td>
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<tr>
<td>Information Skills (TU)</td>
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<td></td>
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<tr>
<td>Co-Curriculum Course (TU)</td>
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<tr>
<td>Asas Pembudayaan Keusahawanan</td>
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<tr>
<td>English for Communication</td>
<td>6</td>
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<tr>
<td>Electives from Other Faculties (KEL)</td>
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</table>

**Core Courses**

| Electives from Other Faculties (KEL) | 2 |

**Research Project**

| Faculty Courses | 10 |

**Electives from Other Faculties (KEL)**

**Total**

| 110 |

2. **B) Programme Structure (For International Students)**

<table>
<thead>
<tr>
<th>University Courses</th>
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<th>(15% of 110 hours)</th>
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<td>Pengenalan Kepada Malaysia</td>
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<tr>
<td>Information Skills (TU)</td>
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<td>English for Communication</td>
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</table>

**Core Courses**

| Electives from Other Faculties (KEL) | 2 |

**Research Project**

| Faculty Courses | 10 |

**Electives from Other Faculties (KEL)**

**Total**

| 110 |

**TWU** – Teras Wajib Universiti (Pass = C and above)

**TU** – Teras Universiti (Pass = D and above)

**KEL** – Elektif Luar Fakulti (Pass = C and above)

**(K)** – Student is given option to take the course or via credit exception
2. Course Structure

**Level 1 Semester 1**

<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
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<td>MEEB 1101</td>
<td>Introductory Human Physiology</td>
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<td>MTEB 1101</td>
<td>Introductory Biochemistry I</td>
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<td>MTEB 1106</td>
<td>Essential Medical Microbiology</td>
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<tr>
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**Electives**

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<th>Course Name</th>
<th>Credits</th>
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<tr>
<td>MTEB 1301</td>
<td>Basic Laboratory Techniques and Procedures I</td>
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</table>

**Total credits** 23

**Level 1 Semester 2**

<table>
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<th>Credits</th>
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<tr>
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<td>Introductory Biochemistry II</td>
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</tr>
<tr>
<td>MTEB 1104</td>
<td>Introductory Course in Biostatistics</td>
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<tr>
<td>MJEB 1101</td>
<td>Basic Parasitology</td>
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<tr>
<td>MTEB 1103</td>
<td>Cell Biology and Introductory Genetics</td>
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**Electives**

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<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MTEB 1304</td>
<td>Laboratory Mathematics and Statistics</td>
<td>2</td>
</tr>
<tr>
<td>MTEB 1305</td>
<td>Basic Laboratory Techniques and Procedures II</td>
<td>2</td>
</tr>
<tr>
<td>MTEB 1303</td>
<td>Medical Laboratory Techniques II - Analytical Biochemistry</td>
<td>3</td>
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**Total credits** 22

**Level 1 Special Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTEB 1380</td>
<td>*Clinical Laboratory Posting</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(6 weeks) *Pass / Fail basis</td>
<td></td>
</tr>
<tr>
<td>MTEB 1401</td>
<td>Medical Laboratory Techniques I - Histological Techniques (b)</td>
<td>2</td>
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</tbody>
</table>

**Total credits** 5
### Level 2 Semester 1

#### Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTEB 2101</td>
<td>Principles of Epidemiology and Epidemiological Research Design</td>
<td>1</td>
</tr>
<tr>
<td>MTEB 2202</td>
<td>Cellular and Molecular Genetics (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1103</em></td>
<td></td>
</tr>
<tr>
<td>MKEB 2201</td>
<td>General Pathology (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1101</em></td>
<td></td>
</tr>
<tr>
<td>MTEB 2204</td>
<td>Basic Immunology</td>
<td>2</td>
</tr>
<tr>
<td>MDEB 2201</td>
<td>Principles of General Pharmacology &amp; Toxicology (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1101</em></td>
<td></td>
</tr>
<tr>
<td>MVEB 2101</td>
<td>Nuclear Medicine Technology: Basic Course</td>
<td>2</td>
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</table>

#### Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MFEB 2401</td>
<td>Microbial Infection (b)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1106</em></td>
<td></td>
</tr>
<tr>
<td>MFEB 2403</td>
<td>Introductory Diagnostic Microbiology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1106</em></td>
<td></td>
</tr>
<tr>
<td>MTEB 2301</td>
<td>Critical Thinking and Communication for Biomedical Science</td>
<td>3</td>
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Total credits: 22

### Level 2 Semester 2

#### Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>MTEB 2105</td>
<td>English for Biomedical Science</td>
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#### Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MTEB 2401</td>
<td>Principles of Molecular Biology (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 2202</em></td>
<td></td>
</tr>
<tr>
<td>MKEB 2404</td>
<td>Course in Diagnostic Clinical Chemistry I (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1101, MTEB 1102</em></td>
<td></td>
</tr>
<tr>
<td>MKEB 2401</td>
<td>Basic Practical Anatomic Pathology (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 2201</em></td>
<td></td>
</tr>
<tr>
<td>MKEB 2403</td>
<td>Basic Haematology &amp; Transfusion Technology (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 2201, MTEB 2204</em></td>
<td></td>
</tr>
<tr>
<td>MFEB 2404</td>
<td>Introductory Diagnostic Virology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1106</em></td>
<td></td>
</tr>
<tr>
<td>MVEB 2401</td>
<td>Nuclear Medicine Technology: Intermediate Course (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MVEB 2101</em></td>
<td></td>
</tr>
<tr>
<td>MJEB 2401</td>
<td>Basic Course in Diagnostic Parasitology (b)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MTEB 1101</em></td>
<td></td>
</tr>
<tr>
<td>MEEB 2402</td>
<td>Medical Physiology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><em>Prerequisite: MEEB 1101</em></td>
<td></td>
</tr>
<tr>
<td>MTEB 2302</td>
<td>Biomedical Ethics</td>
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Total credits: 30

### Level 2 Special Semester

#### Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MTEB 2180</td>
<td><em>Research Project in Biomedical Sciences</em></td>
<td>5</td>
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</tbody>
</table>

- *Grade P is earned at the end of the Special Semester. Full evaluation for MTEB 2180 is conducted at the end of Semester 1 of the following academic year.*
### Level 3 Semester 1

#### Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MTEB 2180</td>
<td>Research Project in Biomedical Sciences</td>
<td>5</td>
</tr>
<tr>
<td>MTEB 3101</td>
<td>Principles and Practice of Management</td>
<td>2</td>
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#### Elective Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>MFEB 3403</td>
<td>Advanced Diagnostic Virology</td>
<td>3</td>
</tr>
<tr>
<td>MFEB 3401</td>
<td>Application and Advances in Molecular Biology (b)</td>
<td>3</td>
</tr>
<tr>
<td>MFEB 3401</td>
<td>Advanced Medical Virology</td>
<td>2</td>
</tr>
<tr>
<td>MVEB 3401</td>
<td>Nuclear Medicine Technology: Advanced Course (b)</td>
<td>3</td>
</tr>
<tr>
<td>MJEB 3401</td>
<td>Advanced Course in Diagnostic Parasitology (b)</td>
<td>3</td>
</tr>
<tr>
<td>MKEB 3403</td>
<td>Advanced Haematology &amp; Transfusion Technology (b)</td>
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Total credits: **25**

### Level 3 Semester 2

#### Elective Courses

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MKEB 3404</td>
<td>Course in Diagnostic Clinical Chemistry II (b)</td>
<td>4</td>
</tr>
<tr>
<td>MKEB 3401</td>
<td>Advanced Practical Anatomic Pathology (b)</td>
<td>4</td>
</tr>
<tr>
<td>MFEB 3402</td>
<td>Advanced Medical Microbiology</td>
<td>2</td>
</tr>
<tr>
<td>MFEB 3404</td>
<td>Advanced Diagnostic Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>MTEB 3403</td>
<td>Applied Immunology (b)</td>
<td>3</td>
</tr>
<tr>
<td>MKEB 3402</td>
<td>Advances in Cellular Pathology (b)</td>
<td>2</td>
</tr>
<tr>
<td>MEEB 3401</td>
<td>Advanced Medical Physiology</td>
<td>3</td>
</tr>
<tr>
<td>MDEB 3401</td>
<td>Advanced Medical Pharmacology</td>
<td>3</td>
</tr>
<tr>
<td>MTEB 3302</td>
<td>Analytical Techniques in Clinical Toxicology and Xenobiotics</td>
<td>2</td>
</tr>
<tr>
<td>MTEB 3303</td>
<td>Current Topics in Biomedical Science</td>
<td>3</td>
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</table>

Total credits: **31**

**Note:**

i. Students are to select at least 14 credits from the list of Level 3 Elective Courses.

ii. **Availability of Courses**

   The Faculty reserves the right to discontinue or vary the course whenever circumstances require. Courses may not be offered due to insufficient enrolment or non-availability of teaching personnel.

iii. **Lecturers in charge of the courses have the authority to remove pre-requisites for a course when necessary.**

iv. **All information is correct up to time of printing.**
5. COURSE ASSESSMENT

Students are assessed at regular intervals during each course to gauge whether they are able to apply knowledge, demonstrate understanding and show an acquisition of skills.

- **Continuous assessment**

Regular feedback on progress is monitored via continuous assessments made during the duration of each course. This allows for sufficient opportunities for the student/department to take remedial action. Continuous assessment includes lab reports, quizzes, short projects, and other types of assessment tools used by individual lecturers. Unless stated in the course outline, continuous assessment accounts for \( \leq 40\% \).

- **Examinations**

Examinations are held at the end of each semester for each course. Unless stated in the course outline, final examination accounts for \( \geq 60\% \).

6. LATE ARRIVAL FOR EXAMINATIONS

Examination schedules shall be distributed to students in advance and students are required to attend at least 15 minutes before the start of the examination. No student shall be admitted after the first 30 minutes of an at least 2 hour duration examination and are not to leave within the last 15 minutes.

7. MOBILE PHONES/ OTHER ELECTRONIC DEVICES

Students are absolutely prohibited from possession of these items during the examination.

8. ATTENDANCE REQUIREMENTS OF THE COURSE

Attendance at all scheduled classes is compulsory. Attendance will be taken and students with unsatisfactory attendance may be barred from the end of semester examinations.

9. CLASS SCHEDULES

Class schedules are published on the Faculty of Medicine website ([http://fom.um.edu.my](http://fom.um.edu.my)). Students are expected to check the faculty website and notice boards regularly for any announcements or changes in schedules.

10. STUDENT RESPONSIBILITIES

Students shall conduct themselves in a professional manner at all times. During class and working hours they are required to be attired according to the faculty dress code. Students are required to be present at all teaching sessions at the scheduled times.

11. MEDICAL FACULTY STUDENT DRESS CODE

See appendix

12. APPEALS

Any student who has been excluded from the Programme has a right to appeal to the Appeals Committee of the University.

13. WEBSITE

The faculty website is: [http://fom.um.edu.my](http://fom.um.edu.my)
14. ADMISSION REQUIREMENTS

i. SPM

Obtained at least a credit at SPM level in the following three (3) subjects:

- Biology
- Physics
- Chemistry

(Grade B (CGPA 3.00) in the above subjects at Matriculation level can be accepted as a substitute for credit in SPM level.)

ii. STPM

Obtained a combination of at least two (2) Grade B (NGMP 3.00) and one (1) Grade C (NGMP 2.00) in the following subjects:

- Mathematics
- Chemistry
- Biology
- Physics
- Additional Mathematics

iii. Matriculation Level

Obtained a combination of at least Grade B (NGMP 3.00) in two (2) of the following subjects and Grade C (NGMP 2.00) in one of the following subjects at Matriculation level:

- Mathematics
- Chemistry
- Biology
- Physics

iv. Diploma Level

Possess an Advanced Certificate / Diploma in Medical Laboratory Technology with at least an overall score of 60% or at least a CGPA of 3.00
15. COURSE OUTLINE

LEVEL 1 - SEMESTER 1

**MTEB 1106: Essential Medical Microbiology (3 credit hours)**

*Learning Outcomes*
1. Describe pathogenic microorganisms and their relationship to diseases.
2. Identify pathogenic microorganisms using specific laboratory techniques.
3. Select suitable diagnostic tests for the confirmation of pathogenic microorganisms.

*Course Synopsis*
This course introduces the applications of microbiology in the laboratory diagnosis of pathogenic microorganisms: bacteria, viruses, and fungi. Emphasis is given on the important key features, growth characteristics, virulent factors, and laboratory identification of microorganisms.

*Reference Texts*

*Course Coordinator*
Professor Dr. Mary Anne Tan Jin Ai

*Course Assessment*
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

**MTEB 1101: Introductory Biochemistry I (3 credit hours)**

*Learning Outcomes*
1. Describe the main classes of biological macromolecules such as carbohydrates, lipids and proteins (including enzymes), identify the components of the macromolecules and conceptualize their basic roles/functions in the cellular system.
2. Describe the major human pathways for biosynthesis of macromolecules and the regulation of key enzymes.
3. Describe various basic methods of analysis to identify the characteristics and reactions of biomolecules such as carbohydrates, lipids, proteins and enzymes.
4. Analyze, interpret simple Biochemical data.

*Course Synopsis*
The course will begin with an introduction to basic thermodynamics and the chemistry of cells, and proceed to illustrate the cell structure, and the functions of the various organelles within it. The structure, function, and importance of the various biomolecules such as carbohydrates, lipids and proteins as well as their respective derivatives will be discussed.

*Reference Texts*

*Course Coordinator*
Associate Professor Dr. Umah Rani Kuppusamy

*Course Assessment*
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MEEB 1101: Introductory Human Physiology (3 credit hours)

Learning Outcomes
1. Understand the concept of homeostasis and their relationship to diseases.
2. Appreciate the integration of structures and functions.
3. Apply basic cell physiology mechanisms to pathophysiological situations.

Course Synopsis

Reference Texts

Course Coordinator
Associate Professor Dr. Cheng Hwee Ming

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MAEB 1101: Foundational Anatomy (3 credit hours)

Learning Outcomes
1. Identify and describe the microscopic structures of a cell, basic body tissues and organs and state their functions.
2. Describe the basic organization of each organ system of the human body and state their functions.
3. Describe the events that take place during pre-embryonic period, embryonic and fetal development.

Course Synopsis

Reference Texts

Course Coordinator
Dr. Rosie Pamela David

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 1301: Basic Laboratory Techniques and Procedures I (2 credit hours)

Learning Outcomes
1. Apply laboratory safety regulations.
2. Recognize basic laboratory supplies.
3. Identify specific laboratory equipment.

Course Synopsis
This course introduces the basic principles and techniques of laboratory practice encompassing the following areas: general laboratory supplies; lab ware; measurement of mass and volume; volumetric equipment; balances and weighing; general laboratory equipment; disinfection and sterilization; and laboratory safety.

Reference Texts
Practical Handbook prepared by the Biomedical Science Programme.

Course Coordinator
Dr. Salmah Ismail

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

LEVEL 1 - SEMESTER 2

MTEB 1102: Introductory Biochemistry II (3 credit hours)

Learning Outcomes
1. Describe the steps by which cells breakdown macromolecules/ biomolecules to extract energy or excrete.
2. Explain the principles and mechanisms of metabolic control and caloric homeostatis.
3. Describe and conceptualize the metabolic roles of the major tissues and organs of the body and how the metabolic processes interact with one another.
4. Demonstrate the importance and necessity of Biochemical knowledge to understand other Biomedical disciplines.

Course Synopsis
The course will begin with an introduction to basic bioenergetics and proceed to illustrate the metabolism of various biomolecules such as carbohydrates, lipids and proteins as well as their respective derivatives. This will be followed by discussions on energy yielding processes, their integration and regulation by hormones and second messengers. The last part of the course involves the introduction of nucleic acid structures, nucleic acid metabolism, and the structure of DNA and biochemical genetics.

Reference Texts

Course Coordinator
Associate Professor Dr. Umah Rani Kuppusamy

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 1104: Introductory Course in Biostatistics (2 credit hours)

Learning Outcomes
1. To understand the statistical methods commonly employed in the analysis and presentation of data in biomedical science research.
2. To understand and be able to perform the basics of descriptive statistics.
3. To understand and be able to perform Estimation and Hypothesis testing.
4. Understand and be able to perform the basic parametric statistical methods.
5. Understand the basics and be able to perform Correlation and Simple Linear Regression.
6. To be able to statistically analyze biomedical science data using appropriate methods.

Course Synopsis
This will cover basic statistical techniques that are important for analyzing data arising from biomedical science research. Major topics include descriptive statistics, elements of probability, introduction to estimation and hypothesis testing, analytical techniques for categorical and continuous data, regression analysis. The concept and applications of statistical methods are stressed. At the end of the module, the candidate will acquired skills in their practical implementation and have an understanding of the underlying theory. Practical application exercises are used to illustrate and reinforce theoretical concepts.

Reference Texts

Course Coordinator
Professor Dr. Mary Anne Tan Jin Ai

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MJEB 1101: Basic Parasitology (b) (2 credit hours)

Learning Outcomes
1. Explain the fundamental concepts of Parasitology.
2. Identify the major groups of endo- and ecto-parasites of man.
3. Describe basic morphologies, life cycles and modes of transmission of selected parasites.
4. Describe the control of parasites and vectors.
5. Describe the pathogenesis of selected parasitic infections.
6. Identify medically important arthropods and their significance as vectors of diseases.

Course Synopsis

Reference Texts

Course Coordinator
Dr. Yvonne Lim Ai Lian

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 1103: Cell Biology and Introductory Genetics (3 credit hours)

**Learning Outcomes**
1. Distinguish between prokaryotic and eukaryotic organisms.
2. Identify different components of the cell and interpret how their structure relates to function.
3. Understand and be able to discuss the mechanisms behind cell division in somatic and germ cells.
4. Apply the principles behind cell death to its role in development and homeostasis.
5. Examine the basic concepts of classical genetics and link these concepts to molecular genetics.

**Course Synopsis**
The course will cover cell origin and evolution, cellular components and functions, cellular organelles, cellular processes, cell division, details on mitosis, meiosis, nuclear function, chromosomes and genetics.

**Reference Texts**

**Course Coordinator**
Dr. Salmah Ismail

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MTEB 1304: Laboratory Mathematics and Statistics (2 credit hours)

**Learning Outcomes**
1. Describe basic laboratory mathematics and statistics.
2. Understand the applications of laboratory mathematics and statistics.

**Course Synopsis**
Instruction is provided on basic mathematics relevant to laboratory technology and sciences, including units and their prefixes, conversions between units of measurement, determination of dilution and concentration, and calculation of Molarity.

Students are introduced to frequency distributions, the concept of measures of central tendency and of variations for normal distributions, the application of these measures in quality control, the predictive value theory, and reference range analysis.

Simple statistical techniques for the comparison of performance of laboratory instrumentation and analytical methods are also covered.

**Reference Texts**

**Course Coordinator**
Associate Professor Dr. Mahmood Ameen Abdulla

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 1305: Basic Laboratory Techniques and Procedures II (2 credit hours)

**Learning Outcomes**
1. Identify basic analytical techniques, sample collection and handling.
2. Recognize advance laboratory equipment.
3. Apply simple biochemical and microscopic analysis.

**Course Synopsis**
This course provides instruction and practical training in basic analytical techniques, sample collection and handling, simple biochemical and microscopic analyses, and basic instrumentation.

**Reference Texts**
Practical Handbook prepared by the Biomedical Science Programme.

**Course Coordinator**
Dr. Salmah Ismail

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MTEB 1303: Medical Laboratory Techniques II-Analytical Biochemistry (3 credit hours)

**Learning Outcomes**
1. Identify basic analytical techniques.
2. Recognize analytical equipment.
3. Apply simple analytical analysis.

**Course Synopsis**
This course covers the scientific principles on which common analytical techniques are based. The techniques include photometry, chromatography, electrophoresis, electrochemistry, osmometry, and immunoassays. Practical classes provide hands-on experience on the use of selective techniques and demonstrate the principles underlying these techniques.

**Reference Texts**

**Course Coordinator**
Dr. Chua Kek Heng

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
LEVEL 1 - SEMESTER 3

**MTEB 1380: Clinical Laboratory posting (3 credit hours)**

*Learning Outcomes*
1. Organise the work flow for a clinical laboratory.
2. Determine the essential diagnostic laboratory tests for a specific clinical laboratory.
3. Identify duties and safety preventive measures essential for a clinical laboratory.

*Course Synopsis*
The student will be stationed in a clinical laboratory for six weeks (students have to find the lab of interest and request for permission to be posted in the lab). He/she will observe the work flow in the laboratory and carry out laboratory tests and other tasks essential for the effective management of a clinical laboratory.

*Reference Texts*
- None -

*Course Coordinator*
Professor Dr. Mary Anne Tan Jin Ai

*Course Assessment*
Submission of a written report.

**MTEB 1401: Medical Laboratory Techniques I-Histological Techniques (b) (2 credit hours)**

*Learning Outcomes*
1. Understand the principles underlying basic histological techniques.
2. Perform practical training in basic histological techniques.
3. Select suitable method for the staining of particular tissue sections.

*Course Synopsis*
This course introduces the basic principles underlying the processes involved in (1) the preparation of histological sections and (2) staining of tissue sections to demonstrate the normal histology of epithelial and connective tissues.

Students are given elementary practical instructions on the processing of tissue specimens and preparation of stained histological sections.

*Reference Texts*
Practical Handbook prepared by the Department of Molecular Medicine.

*Course Coordinator*
Associate Professor Dr. Mahmood Ameen Abdulla

*Course Assessment*
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
LEVEL 2- SEMESTER 1

MTEB 2101: Principles of Epidemiology and Epidemiological Research (1 credit hours)

Learning Outcomes
1. Define basic concepts of epidemiology
2. Recognize the application of epidemiology in the field of biomedical sciences
3. Demonstrate study designs used in epidemiological research

Course Synopsis

Reference Texts

Course Coordinator
Professor Dr. Mary Anne Tan Jin Ai

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MTEB 2202: Cellular and Molecular Genetics (b) (3 credit hours)

Learning Outcomes
1. Describe the nature, organization and specific characteristics of human chromosomes in the human genome, karyotypes and karyograms and nucleic acids as repositories of genetic information.
2. Identify the salient features of the human and other genomes and describe in detail mechanisms underlying gene replication, rearrangement and mutation in prokaryotic and eukaryotic cells and organisms
3. Address specificities related to cell cycle control, myriad forms of differential gene expressions, mechanisms governing DNA damage and repair.

Course Synopsis
The course will expand on the understanding of Mendelian inheritance, qualitative and quantitative genetics. Current knowledge of the chromosomal and molecular basis of inheritance will be explored. Chromosome structure, characterisation, behaviour and effects will be covered. Specific examples to illustrate processes such as division, replication, transcription, translation, the genetic code, and where appropriate, aspects of gene regulation will be outlined. Included will be important aspects of the dynamic genome, mutation and repair mechanisms.

Reference Texts

Course Coordinator
Dr. Azlina Ahmad Annuar

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
**MKEB 2201: General Pathology (b) (3 credit hours)**

*Learning Outcomes*
1. Demonstrate understanding of basic facts, concepts and theories in the field of pathology.
2. Describe characteristic morphological features of common pathological conditions.
3. Recognize pathological changes at macroscopical and microscopical levels.

*Course Synopsis*
This course covers basic pathological processes including (1) Cellular responses to injury; (2) Inflammation, healing and repair; (3) Disorders of body fluids, homeostasis and blood flow; (4) Nutritional disorders; (5) Metabolic disorders; (6) Disorders of growth; (7) Neoplasia; (8) Disorders of the immune system.
Relevant structural changes associated with respective pathological conditions, demonstrable at light microscopy level, will form an essential component of this course.

*Reference Texts*

*Course Coordinator*
Dr. Manimala Naicker / Ms. Bahiyah Raup

*Course Assessment*
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

**MTEB 2204: Basic Immunology (2 credit hours)**

*Learning Outcomes*
1. Define different types of immune responses
2. Recognize different types of immunological techniques
3. Select suitable tests for immunological diagnosis

*Course Synopsis*
The course provides an introduction to the human immune system and the basic principles in immunology. Topics covered include the structure and functions of the immune system, the innate and acquired immune responses, the humoral and cell-mediated immune responses, cells of the immune system, immunoglobulins, cytokines, and complements.

*Reference Texts*

*Course Coordinator*
Dr. Chua Kek Heng

*Course Assessment*
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MDEB 2201: Principles in General Pharmacology & Toxicology (b) (3 credit hours)

Learning Outcomes
1. Identify essential background knowledge in pharmacology and toxicology
2. Demonstrate practical training in basic techniques used in pharmacological research

Course Synopsis
The course covers four main areas:
1. General pharmacology, including pharmacokinetics and pharmacodynamics;
2. Autonomic pharmacology including the pharmacology of drugs that directly affect the autonomic nervous system and those that affect effector's organs controlled by the autonomic nervous system;
3. Experimental pharmacology which is focused on the basic techniques used in pharmacological research; and
4. Systemic Review
5. Drugs Affecting the Neuromuscular System
6. Toxicology including:
   i. Principles of Toxicology
   ii. Tissue Response to Toxicants
   iii. Metallic Toxicants
   iv. Non-Metallic Toxicants
   v. Evaluation of Toxicity

Reference Texts

Course Coordinator
Associate Professor Dr. Rohaini Mohd

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MVEB 2101: Nuclear Medicine Technology: Basic Course (2 credit hours)

Learning Outcomes
1. Give students an overview of nuclear technology in medicine
2. Provide an understanding of radioactivity
3. Provide an overview on how the measurement and detection of radiation are done
4. Introduce the effect of radiation on the biological system
5. Introduce all radioactive substances and machines which are selected for the clinical study in nuclear medicine

Course Synopsis
The course covers basic atomic and nuclear physics, nature of radioactivity, decay, half life, photoelectric effect, Compton scattering, Pair production, half values, radiation exposure, absorbed dose and equivalent dose, methods of radiation protection, laboratory rules and regulations, biological effects, radiation dosimetry, radiation detection equipment, gamma camera and radiopharmaceutical preparation, and various other areas.

Reference Texts

Course Coordinator
Mr. Tan Li Kuo

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MFEB 2401: Microbial Infection (b) (2 credit hours)

Learning Outcomes
1. Recognize the fundamentals in clinical microbiology inclusive of clinical manifestation, diagnosis, treatment, and prevention.
2. Identify local and systemic infections, current methods of treatment and prevention.
3. Discuss the epidemiology of specific microbial diseases.

Course Synopsis

Reference Texts

Course Coordinator
Dr. Tay Sun Tee

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MFEB 2403: Introductory Diagnostic Microbiology (3 credit hours)

Learning Outcomes
1. Define basic principles of diagnostic medical microbiology.
2. Perform and explain basic techniques / procedures used in laboratory diagnosis of microbial infection.

Course Synopsis
- Bacterial media preparation,
- Sterilisation and disinfection facilities;
- General bacteriology;
- Hospital acquired infection;
- Respiratory infection and tuberculosis;
- Anaerobic infection;
- Sexually transmitted diseases

Reference Texts

Course Coordinator
Dr. Maria Kahar Bador

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 2301: Critical Thinking and Communication for Biomedical Science (2 credit hours)

Learning Outcomes
1. Identify basic concepts of thinking and communication skills
2. Demonstrate effective communication
3. Apply concepts learned to solve problems, value opinions, and deliver decisions effectively

Course Synopsis
At the end of this course, students will be able to:
1. Identify the basic concepts of thinking skills and communication skills.
2. Identify structures in thinking skills and dimension in thinking.
3. Distinguish the differences between types of communication.
4. Apply thinking and communication skills in everyday life.
5. Value the importance and impact of the thinking technique
6. Communicate efficiently.

Reference Texts

Course Coordinator
Dr. Salmah Ismail

Course Assessment
Course will be assessed by Continuous Assessment (≤60%) and a Final Exam (≥40%)

LEVEL 2- SEMESTER 2

MTEB 2105: English for Biomedical Science (4 credit hours)

Learning Outcomes
1. Using English as the medium for various academic and social situations i.e. discussions, presentations, forums, etc
2. Efficient reading of academic texts in English
3. Writing academic projects in English

Course Synopsis
This course allows students to gain skills in communication and interpersonal aspects that are relevant to their professional needs. The course covers all skills needed for academic purposes, with particular emphasis on verbal communication. Special attention will be given to productive skills that are relevant to each student’s discipline and future occupation.

Reference Texts
Journals relevant to the syllabus

Course Coordinator
Professor Dr. Mary Anne Tan Jin Ai

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 2401: Principles of Molecular Biology (3 credit hours)

**Learning Outcomes**
1. Identify key elements required for theoretical and practical aspects of recombinant DNA technology.
2. Perform basic molecular biology based experimentation such as DNA isolation, quantification, restriction analysis, genomic amplification and interpretation.
3. Familiarize themselves with aspects good laboratory practice and address biosafety issues in the context of a biomedical research project.

**Course Synopsis**
The course will address the developments that have led to ‘New Genetics’ i.e. molecular biology. The focus will be on the basic terminology, various tools and techniques of Recombinant DNA technology with emphasis on the biomedical and related aspects. The practical aspects are much emphasised. Highlighted areas include DNA extraction, restriction, ligation, creation of recombinant molecules, Southern blotting, hybridisation analysis and polymerase chain reaction. The course will also include some issues on biological safety and ethical considerations.

**Reference Texts**
4. Various chapters in previous references related to Recombinant DNA Technology

**Course Coordinator**
Dr. Chua Kek Heng

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MKEB 2404: Course in Diagnostic Clinical Chemistry I (3 credit hours)

**Learning Outcomes**
1. Define the metabolism of nutrients in health and science.
2. Recognise the biochemical basis and consequences of metabolic disorders.
3. Relate the principles and techniques employed for the determination of body fluid analytes.
4. Identify the basic principles of laboratory operations.

**Course Synopsis**

**Reference Texts**

**Course Coordinator**
Associate Professor Dr. Umah Rani Kuppusamy / Dr. Chua Kek Heng

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MKEB 2401: Basic Practical Anatomic Pathology (3 credit hours)

Learning Outcomes
1. Process tissues for histological examination.
2. Carry out specific staining techniques to demonstrate specific substances in tissues.
3. Select suitable staining techniques for confirmation of specific histopathological diagnosis.

Course Synopsis
Students will be taught the scientific basis of standard tissue processing methods and staining techniques and the common artifacts encountered due to inappropriate handling of tissues and tissue sections. Practical sessions provide hands-on experience as well as allow the study of the effects of improper tissue handling and processing. Staining techniques covered include (1) staining with dyes, (2) impregnation with metallic salts and (3) use of in-situ chemical reactions for use in light microscopy work.

Reference Texts

Course Coordinator
Associate Professor Dr. Mahmood Ameen Abdullah / Ms. Syuhada Ahmad Bashah

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MKEB 2403: Basic Haematology and Transfusion Technology (b) (3 credit hours)

Learning Outcomes
1. To recognize elementary knowledge of common haematological disorders including the haematopoetic system
2. To apply theoretical basis and practical training in routine haematological investigations
3. To understand and apply basic principles of transfusion immunology and laboratory management of transfusion services

Course Synopsis
Biology of the red and white blood cell series; Disorders of red and white blood cells - laboratory investigations of these disorders. Haemostasis and pathogenesis of bleeding disorders. Investigations of bleeding disorders. Basic concepts and principles pertaining to blood transfusion and aphaeresis services including blood collection, component processing and quality assurance. Blood group antigens and antibodies – basic theory, techniques. ABO discrepancies and their resolution; Blood component production.

Reference Texts

Course Coordinator
Dr. Veera Sekaran Nadarajah / Ms. Hong Lih Chun

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MFEB 2404: Introductory Diagnostic Virology (3 credit hours)

Learning Outcomes
1. Define basic principles of diagnostic medical virology, mycology and serology
2. Perform and explain techniques and procedures used in laboratory diagnosis

Course Synopsis
To introduce students to the basic principles of diagnostic virology, mycology, and serology, and to provide students with hands-on experience of the common techniques and procedures used in laboratory diagnosis.

Reference Texts

Course Coordinator
Dr. Chan Yoke Fun

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MVEB 2401: Nuclear Medicine Technology: Intermediate Course (b) (3 credit hours)

Learning Outcomes
1. Give students an overview of nuclear technology in medicine
2. Provide an understanding of radioactivity
3. Provide an overview on how the measurement and detection of radiation are done
4. Introduce the effect of radiation on the biological system
5. Introduce all radioactive substances and machines which are selected for the clinical study in nuclear medicine

Course Synopsis
This course covers nuclear structure and composition, Bremsstrahlung internal conversion, electron capture, isomeric transition, internal and external radiation dosimetry, stability, Malaysian Atomic Board licensing regulations, personnel and area monitoring, decontamination, radiation effects on biological systems, principles, operation of the gamma camera, computing, functional imaging, and non-imaging studies.

Reference Texts

Course Coordinator
Mr. Tan Li Kuo

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MJEB 2401: Basic Course in Diagnostic Parasitology (b) (3 credit hours)

Learning Outcomes
1. Explain basic concepts and principles of diagnostic Parasitology
2. Describe basic methods in the diagnosis of parasites in faeces, blood and tissue
3. Identify the strength and weaknesses (sensitivity and specificity) faced by the respective diagnostic method for the parasitic infections and to compare with the available conventional diagnostic tools

Course Synopsis
The course covers various basic aspects of diagnostic techniques of protozoa and helminths. Faecal examination includes direct smear, concentration techniques, egg count, faecal culture and staining methods. Blood examination includes staining, culture and serological diagnosis.

Reference Texts

Course Coordinator
Dr. Yvonne Lim Ai Lian

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MEEB 2402: Medical Physiology (3 credit hours)

Learning Outcomes
1. Understand basic concepts in Physiology as applied to organ systems
2. Integrate structures/physiological functions as applied to organ systems

Course Synopsis

Reference Texts
2. Articles given by respective lecturers.

Course Coordinator
Associate Professor Dr. Cheng Hwee Ming

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 2302: Biomedical Ethics (2 credit hours)

Learning Outcomes
1. Describe the foundations of ethics from diverse civilizations historical timeframe.
2. Identify and elaborate on the four basic ethical principles underpinning biomedical research
3. Identify and address ethical issues inherent in the conduct of biomedical research, scientific publications, clinical trials, genetic engineering, cloning technologies and other related developments

Course Synopsis
This course is designed to give an overview of ethical principles and the application of ethics in Biomedical Sciences. The first part of the course will give the students an understanding of the philosophy of ethics and its importance, and cover basic aspects of professional conduct. They will also be given an overview of the development and study of ethics in the context of scientific research in Life Sciences. Subsequently, students will be exposed to a variety of ethical concerns in Biomedical Sciences: eugenics, cloning, stem cell research, assisted reproductive technology (ART), ethical conduct in research, genetic screening, xenotransplantation, the law and medicine, intellectual property (IP), and patenting issues.

Reference Texts

Course Coordinator
Dr. Azlina Ahmad Annuar

Course Assessment
Course will be assessed by Continuous Assessment (≤60%) and a Final Exam (≥40%)
LEVEL 2- SEMESTER 3 / LEVEL 3- SEMESTER 1

MTEB 2180: Research Project in Biomedical Sciences (10 credit hours)

Learning Outcomes
1. Apply research tools and protocols in the design of scientific projects.
2. Organise research projects from proposal of the project to completion of the project for publication.
3. Compose scientific manuscript for publication in local and international journals.

Course Synopsis
- Research project
- Oral presentation
- Written dissertation

Reference Texts
Relevant texts and scientific publications/journals

Course Coordinator
Professor Dr. Mary Anne Tan Jin Ai

Course Assessment
Student earns a P grade at the end of the special semester. Evaluation will be made at the end of the semester in the next academic year, based on:
   i. the student’s written dissertation
   ii. the student’s oral presentation
   iii. supervisor(s)’s evaluation

LEVEL 3- SEMESTER 1

MTEB 3101: Principles and Practice of Management (2 credit hours)

Learning Outcomes
1. Recall selected aspects of management theories and practices
2. Relate to the reality of organization life at work
3. Demonstrate soft skills needed in the work place

Course Synopsis
1. Organisation
2. Basic Management Processes
3. Human Resource Management
4. Financial Management

Reference Texts
Journals relevant to the student’s syllabus.

Course Coordinator
Professor Dr. Mary Anne Tan Jin Ai

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MFEB 3403: Advanced Diagnostic Virology (2 credit hours)

Learning Outcomes
1. Identify pathogenic viruses using specific laboratory techniques
2. Select suitable laboratory tests for the diagnosis of pathogenic viruses
3. Interpret laboratory results for the diagnosis of pathogenic viruses

Course Synopsis
The course consists of laboratory postings to specific microbiology diagnostic units, i.e. General Virology & Serology, Hepatitis/HIV, and Molecular Diagnostics. Emphasis will be placed on laboratory diagnostic methods, and their relevance to clinical practice.

Reference Texts

Course Coordinator
Associate Professor Dr. Jamal I Ching Sam

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MTEB 3401: Applications & Advances in Molecular Biology (b) (3 credit hours)

Learning Outcomes
1. Identify major components that form the underlying basis to the field and practice of molecular medicine.
2. Describe some current developments in biomedical research and their applications for disease diagnosis, prognosis and management in current clinical settings for infectious and non-infectious diseases.
3. Utilize their knowledge of informed consent, confidentiality, counselling procedures and other issues relevant to the medical scenario in practicable manner in their careers in the biomedical field.
4. Apply their knowledge towards further postgraduate training in biomedical research.

Course Synopsis
The course is an extension of the earlier courses on genetics and molecular biology. It will address the current developments and the many applications of molecular biology focusing on human genetics from both biological and medical perspectives. The course sets a foundation for the student’s pursuit of career and possible academic advancements in the area of biomedical genetics.

Reference Texts
6. Other texts recommended by component lecturers.

Course Coordinator
Dr. Azlina Ahmad Annuar

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MFEB 3401: Advanced Medical Virology (2 credit hours)

Learning Outcomes
1. Recognize viruses of medical importance
2. Relate concepts of research on viral pathogenesis
3. Describe molecular mechanisms of virus replication, pathogenesis, clinical manifestation and recent advancements in virus research

Course Synopsis
The course consists of lectures which cover the following topics: Classification, structure, and replication of viruses; Pathogenesis of viral infection; Host defences against viral infection; Interventions and Chemotherapy; Viral oncogenecity; Emerging viral disease; Viral vaccines

Reference Texts

Course Coordinator
Professor Dr. Sazaly Abu Bakar

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MVEB 3401: Nuclear Medicine Technology: Advance Course (3 credit hours)

Learning Outcomes
1. Give students an overview of advance nuclear technology in medicine such apparatus use to provide radionuclide
2. Provide latest recommendations on radiation protection and laboratory management
3. Provide more information on the principles of SPECT and PET as nuclear medicine imaging system
4. Introduce the effect of radiation on biological system
5. Equip students with the knowledge and skills to run and manage a nuclear medicine laboratory
6. Provide an understanding of other non-imaging nuclear medicine procedures such as GFR and Blood Volume, Radiotherapy and bone mineral densitometry

Course Synopsis
The course covers advanced radiation physics, complex scenario radiation dosimetry, International Commission on Radiological Protection guidelines and recommendations and precautions, the therapeutic use of radio pharmaceuticals, SPECT and PET principles, filters, attenuation correction, patient preparation, injection, scheduling and laboratory management, GFR, bone mineral dosimetry, and non-imaging procedures and instruments.

Reference Texts

Course Coordinator
Associate Professor Dr. Shaik Ismail Bux

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MJEB 3401: Advanced Course in Diagnostic Parasitology (b) (3 credit hours)

Learning Outcomes
1. Explain strategies in diagnosis of parasitic infections
2. Explain newer emerging concepts in Parasitology
3. Apply the acquired principles and fundamentals in Parasitology to real life problems pertaining to parasitic infections
4. Apply the understanding of various fields such as biology, molecular, immunology, biomedical and physiology into the study of parasites and parasite behaviour in human hosts.

Course Synopsis
The course covers aspects of maintenance of protozoa and helminth in vivo and cultivation of protozoa and helminth in vitro. Included are various diagnostic techniques as in culture of parasites, immunodiagnostic tests and techniques in molecular parasitology.

Reference Texts

Course Coordinator
Dr. Yvonne Lim Ai Lian

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MKEB 3403: Advanced Haematology and Transfusion Technology (b) (4 credit hours)

Learning Outcomes
1. To understand basic principles of a broad spectrum of techniques employed in haematology and blood transfusion services
2. To practice laboratory techniques employed in haematology and blood transfusion services.
3. To understand basic management principles of a haematology laboratory and blood transfusion unit

Course Synopsis
Major histocompatibility complex and HLA typing. Organisation of transfusion and apheresis services including blood donor aspects, quality assurance and computerisation. Pre-transfusion testing, investigation and identification of antibodies, absorption elution methods, investigation of transfusion reactions, blood components – production, properties and quality control. Apheresis methodologies and cryopreservation. Blood Bank laboratory management; Problem Solving in the transfusion laboratory; Laboratory Organisation; Laboratory Safety; Quality Control; Evaluation of Methodologies and Instrumentation

Reference Texts

Course Coordinator
Dr. Veera Sekaran / Ms. Hong Lih Chun

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

**LEVEL 3- SEMESTER 2**

**MKEB 3404: Course in Diagnostic Clinical Chemistry II (b) (4 credit hours)**

**Learning Outcomes**
1. Demonstrate the physiological biochemistry of major organ systems.
2. Appraise the techniques for evaluation of laboratory methods and instrumentation.
3. Interpret the principles and techniques of laboratory organization and management.

**Course Synopsis**

**Reference Texts**

**Course Coordinator**
Associate Professor Dr. Umah Rani Kuppusamy

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

**MKEB 3401: Advanced Practical Anatomic Pathology (4 credit hours)**

**Learning Outcomes**
1. Demonstrate understanding of basic principles of a broad spectrum of techniques employed in Anatomic Pathology.
2. Produce consistent staining slides for diagnosis.
3. Evaluate new technologies implement by department.

**Course Synopsis**

**Reference Texts**

**Course Coordinator**
Dr. Manimalar Naicker / Ms. Bahiyah Raup

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MFEB 3402: Advanced Medical Microbiology (2 credit hours)

**Learning Outcomes**
1. Understand and describe the basic principles of diagnostic medical microbiology
2. Describe and perform the basic tests and procedures relating to diagnostic medical microbiology

**Course Synopsis**
The course consists of lectures which cover the following topics:
1. Bacteriology physiology and growth
2. Bacteriology virulence factors
3. Virulent factors that promote colonization
4. Virulent factors that damage the host
5. Host-parasite relationship
6. Bacterial pathogenesis
7. Pathological consequences of bacterial infections
8. Mechanisms of resistance to antibiotics
9. Bacterial vaccines
10. Fungal taxonomy
11. Host-bacteria interactions-experimental approaches
12. Recombinant DNA technology
13. Industrial Microbiology

**Reference Texts**

**Course Coordinator**
Professor Dr. Shamala Devi

**Course Assessment**
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MFEB 3404: Advanced Diagnostic Microbiology (3 credit hours)

**Learning Outcomes**
1. To be able to identify common laboratory pathogens and use standard biochemical tests in identification as well as perform diagnostic kits testing (ex: API).
2. To be able to pick out pathogens from normal flora in specimens where normal flora is usually encountered.
3. To be able to perform and interpret sensitivity tests for bacteria.
4. To be able to perform and interpret simple serology tests used in Diagnostic Microbiology.
5. To be able to correlate the organisms isolated in relation to the common pathogens involved in infection for the respective system (e.g.: respiratory, urine, etc).
6. To be able to work in the diagnostic laboratory following rules of Laboratory safety.
7. To be able to apply principles of quality control in the Diagnostic Laboratory.

**Course Synopsis**
The course consists of laboratory training on practical skills, postings to specific microbiology diagnostic units and tutorials/discussion. A Conass will be given, and may consist of a practical test and viva or term paper.

**Reference Texts**

**Course Coordinator**
Dr. Rina Karunakaran

**Course Assessment**
Learning Outcomes
1. Understand the basis of immunologic injury and the effects of deficient immunologic defences and their relationship to diseases.
2. Relate basic immunology with laboratory techniques used for the evaluation of immunological disorders.
3. Understand the methods used in diagnostic immunology.
4. Understand the instruction and practical training in these techniques.

Course Synopsis
The course provides an overview of the immunopathologic processes that result in tissue injury and a brief review of the range of immunologic diseases commonly encountered in laboratory practice, including autoimmune disorders and diseases resulting from impaired immune responses (acquired and inherited).

Instruction and practical training are provided for laboratory techniques used for the evaluation of immunologic disorders such as ligand immunoassays, immunohistochemistry, immunofluorescence and flow cytometry.

Reference Texts

Course Coordinator
Associate Professor Dr. Mahmood Ameen Abdulla

Course Assessment
Course will be assessed by Continuous Assessment (<40%) and a Final Exam (>60%)

MEEB 3401: Advanced Medical Physiology (3 credit hours)

Learning Outcomes
1. Apply physiological knowledge and functions in the design of a mini research project
2. Organize a mini research project
3. Identify the techniques of seminar presentation and analysis of experimental data

Course Synopsis
Current and research information on: Hearing and balance, vision, Neuropeptide, Pain, Locomotion, Exercise Physiology; Cardiovascular System; Blood Volume/Pressure Regulation; Hormone Receptor Mechanisms; Ion Channel Physiology; EEG, Neurotransmitters, & Endocrine Functions, High altitude, diving physiology

Reference Texts

Course Coordinator
Associate Professor Dr. Kim Kah Hwi

Course Assessment
Course will be assessed by Continuous Assessment (<40%) and a Final Exam (>60%)
MDEB 3401: Advanced Medical Pharmacology (3 credit hours)

Learning Outcomes
1. Recognize additional groups of therapeutic agents
2. Identify current research areas in medical pharmacology

Course Synopsis
1. Therapeutic Drug Monitoring & Drug Analysis
2. Clinical Trials
3. Drugs Affecting the Central Nervous System
4. Drugs Affecting the Endocrine System
5. Drugs Affecting the Cardiovascular System
   i. Diuretics
   ii. Antianginal Drugs
   iii. Antiarrhythmic Drugs
   iv. Drugs For Congestive heart Failure
   v. Antihypertensive Drugs
   vi. Antihyperlipidaemic Drugs
6. Drugs Affecting the Respiratory System
7. Drugs Affecting the Gastrointestinal System
8. Drugs Affecting the Blood System

Reference Texts

Course Coordinator
Associate Professor Dr. Rohaini Mohd

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)

MTEB 3302: Analytical Techniques in Clinical Toxicology and Xenobiotics (2 credit hours)

Learning Outcomes
1. To recognize the clinical application of biomedical analysis for toxic compounds and xenobiotics
2. To identify the basic principles of instruments used in analysis of these chemicals
3. To differentiate the use of different analytical instruments in conducting biomedical analysis

Course Synopsis
Basics and Principles of High Performance Liquid Chromatography, Gas Chromatograph Mass Spectrometer, Application of HPLC and GCMS in Biomedical, Toxicology and Xenobiotics Analysis; Methodology in Toxicology, Biomedical and Clinical Drug Research; Sample Preparation; Method Validation

Reference Texts
To be announced

Course Coordinator
Professor Dr. Mustafa Ali Mohd

Course Assessment
Course will be assessed by Continuous Assessment (≤40%) and a Final Exam (≥60%)
MTEB 3303: Current Topics in Biomedical Science (3 credit hours)

**Learning Outcomes**
1. Identify the different areas of current and up-and-coming research in Malaysia and internationally.
2. Interact with experts in their respective fields.
3. Discuss aspects of the topics for their impact on science and humanity.

**Course Synopsis**
This course will broadly cover areas of biomedical science and biotechnology. To begin with students are introduced to the idea of creative presentation styles and briefly familiarized with the requirements for writing and publishing. This is followed by weekly sessions with guest lecturers who are at the top of their field, and scientists engaged in the everyday practice of biomedical science and technology. Students are encouraged to engage in critical thinking during oral presentations and discussions on topics that crop up, and to network with the specialists they meet with. The training should hold students in good stead, especially when presenting papers at scientific conferences or public lectures catered for a wide audience.

**Reference Texts**
- None -

**Course Coordinator**
Dr. Azlina Ahmad Annuar

**Course Assessment**
Course will be assessed by Continuous Assessment (≤60%) and a Final Exam (≥40%)
Faculty Facilities

- Tan Sri Danaraj Medical Library
- Multidisciplinary Laboratories
- Clinical Skills Laboratory
- Computer Laboratories
- Medical Illustration and Multimedia Development Unit
- Anatomy Resource Centre
- Central Pathology Museum
- University Book Store (Medical)
- Medsoc
Tan Sri Danaraj Medical Library

The Medical Library on the 3rd floor of the faculty contains 100,000 volumes and subscribes to about 2,000 current journals. An extensive collection of reference works, printed indexing and abstracting services are maintained. The library permits access to a number of databases both on-line and on compact discs in the various fields of medicine and allied health care. In addition, the library offers cassette-tape, tape-slide, video-viewing and discussion room facilities, inter-library loan, photocopying, and document binding services. Branch libraries are at the Klang and Kuala Langat District Complexes. These libraries aim to provide good quality and friendly service in a pleasant environment. Care of all library material is essential to maintaining this standard. Instructions regarding the use of facilities should be obtained from the library staff.

The Main UM Library, which is situated in the main campus, contains more than 1 million volumes, a microfilm processing unit and photocopying facilities.

**Library times:**
- Mon-Fri: 0800 – 2230 hr
- Sat & Sun: 0800 – 1530 hr

**Multi-Disciplinary Laboratories**
A special facility at FOM is the multidisciplinary laboratory, collectively known as the MD Labs (I and II). As their name implies, these labs serve various purposes which include wet and dry laboratory practicals, tutorials, self-directed learning stations, and structured para-clinical examinations. It also serves as a home-base for the students.

**Clinical Skills Laboratories**
The Clinical Skills Laboratory (CSL) of FOM provides facilities for the teaching of clinical skills and procedures. It is equipped with a wide range of simulators. The centre allows medical and paramedical students and doctors to use these simulators for learning and practicing the clinical skills and procedures in a safe, controlled environment. For detail information visits its webpage: [http://www.ummc.edu.my/csl](http://www.ummc.edu.my/csl).
Computer Laboratories
The computer laboratories are equipped with 90 computers which are available to students of FOM for various computer-aided learning programmes and are open till 11.30 pm on weekdays.

Medical Illustrations and Multimedia Development Unit
This unit is a centre for production of media and resources to support teaching and research at the FOM. Comprehensive photographic and graphic services are offered, and there is a fully equipped video unit as well. Other services include management of the Faculty's lecture theatres and audiovisual equipment.

Anatomy Resource Centre
The Anatomy Resource Centre (ARC) has been designed to emphasise clinically relevant anatomy and stimulate ‘active learning’ for students in a pleasant conducive environment. Although designed as a multidisciplinary resource primarily for medical students, it also serves the needs of dental students and others from the allied health sciences as well as postgraduate health professionals. In addition, the ARC plays a very vital role in educating the public about the importance of anatomy in clinical medicine.

Key features include potted and plastic-encased cadaveric specimens, a range of diagnostic images, and clinical scenario quizzes. In addition, activity stations have been designed to focus on interactive learning through multimedia computers, educational anatomy software and medical websites as well as anatomy videotapes. Dedicated timetable slots in the Phase I medical course encourage self-learning in the ARC by medical students. All regular ARC users are issued with security smart cards to enter and exit the centre. ARC user profiles are
continuously recorded and analysed from the computerised door entry records. Student perception of ARC educational value is assessed regularly through feedback questionnaires.

Central Pathology Museum

University Book Store (Medical)

Located on the ground floor of Menara Timur in UMMC, the Medical Book Store stocks a comprehensive supply of medical textbooks in all medical disciplines. It also supplies students’ clinical learning aids and stationeries.
Campus Facilities

- Accommodation
- Students/SHIP and Loan
- Student Health Services
- Student Counseling Services
- University Book Store
- Pekansiswa
- Shops/Pharmacy/Florist
- Banking Services
- Main Library
- Sports and Recreation
- Mosque
Accommodation

University of Malaya has 13 residential colleges that can accommodate up to 12,000 students, which represents about 65% of all the students pursuing their first degrees. Each residential college is administered by a principal and assisted by several fellows. These Residential Halls not only provide students with accommodation, but also provide facilities such as game courts, reading rooms, grocery shops, cyber cafes and computer labs.

Further information for on- or off-campus accommodation can be obtained from the Student Affairs Section, UM.

Student Scholarship/Loans Unit

This unit, located in the Student Affairs Section, UM, handles applications for scholarship/loans from national, state and statutory bodies, including private companies and philanthropic organizations.

Student Health Clinic

Mon-Fri: 0800 – 1230
Sat: 0800 – 1245
No service on Sun/public holiday

The clinic is situated in the 12th Residential College building in the UM campus. This service is available to all students throughout the year.

UM Medical Centre

24-hour emergency medical service is available to all UM students at the Trauma Centre of the University Malaya Medical Centre.

Student Counseling Service

Mon-Fri: 0900 – 1230
Sat: 0900

Confidential counselling service is available to all UM students, offered by the Student Development Section, which is situated at the Perdanasiswa Complex.

The UM Medical Centre provides added counselling service for its students. For further information, please refer to current faculty notices on Counselling Service.

Pekan Buku (0900 – 1700)
A large bookshop is strategically placed at the Perdanasiswa complex (C). Prices are competitive and the range is wide. A branch outlet for medical books is available on the second floor of the main hospital block, adjoining the ground floor of the hospital’s Menara Timur.

Pekanasiswa (0900 – 1700)
Mini markets at Perdanasiswa are available for purchasing foodstuff, porting and electrical goods.

Mosque
Masjid Al-Rahman is situated at the main entrance to UM. A surau is situated adjacent to the hospital.
Shops - Pharmacy, Fruit shop & Florist

These shops are available on the first and ground floor of the main hospital block.

Banking Facilities

The CIMB is situated on the ground floor of the Bursar building in the main campus. CIMB, Bank Simpanan Nasional, and Bank Islam auto-teller machines are available on the ground floor of the main hospital block. A Bank Simpanan Nasional branch is situated in the Siswarama building in the main campus. Bank Islam is situated on the ground floor of the Examination Building in campus.
Notes
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BUILDING PLAN
FACULTY OF MEDICINE

Block P
Dept. Of Medicine & Psychological medicine (5th Floor)
Dept. Of Ophthalmology & Otorhinolaryngology (4th Floor)
Dept. Of Anaesthesiology & Orthopeadic Surgery (3rd Floor)
Dept. Of Surgery (2nd Floor)

Block M
Multi Discipline Lab II (5th Floor)
Medical Multimedia Development Unit (4th Floor)
T.J. Danaraj Library (3rd Floor)

Block H
Multi Discipline Lab II (5th Floor)
Medical Multimedia Development Unit &
Main Exam Hall (4th Floor)
T.J. Danaraj Library (3rd Floor)

Block E
Multi Discipline Lab I (5th Floor)
Anatomy Dissection Hall (4th Floor)

Block D
Clinical Skill Lab
Multi Discipline Lab II
& Anatomy Resource Centre

Block B
Multi Discipline Lab I (5th Floor)
Medical Biotechnology Lab (4th Floor)

Block A
Dean's Office
Faculty Of Medicine (5th Floor)

Block Q
Clinical Auditorium (2nd & 3rd Floor)

Block N & O
Dept. Of Parasitology (9th Floor)
Dept. Of Microbiology (4th Floor)
Dept. Of Pathology (3rd Floor)

Block L
Animal Lab Unit (3rd, 4th & 5th Floor)

Block S
Animal Centre Lab

Block I & J
Dept. Of SPM (5th Floor)
Dept. Of Paediatrics, Herd &
SPM (4th Floor)
Post-Graduate Secretariat (3rd Floor)

Block F & G
Dept. Of Pharmacology (5th Floor)
Dept. Of Molecular Medicine (4th Floor)

Block C
Dept. Of Physiology (5th Floor)
Dept. Of Antomy (4th Floor)

Block R
Dept. Of Pharmacy (3rd Floor)
Dept. Of Allied Health Sciences &
Sport Medicine Unit (2nd Floor)