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STUDENT HANDBOOK 2020 / 2021 INTAKE

IJAZAH SARJANA MUDA SAINS BIOPERUBATAN DENGAN KEPUJIAN Bachelor of Biomedical Science with Honours



PUSAT PENGAJIAN BIOPERUBATAN School of Biomedicine



STUDENT HANDBOOK

Bachelor of Biomedical Science with Honours

FACULTY OF HEALTH SCIENCES UNIVERSITI SULTAN ZAINAL ABIDIN

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GENERAL INFORMATION OF UniSZA

1.1 Brief history of UniSZA establishment

Universiti Sultan Zainal Abidin (UniSZA) (previously known as Universiti Darul Iman- UDM) is located in Terengganu, East Coast Peninsula Malaysia an oil producing state with beautiful beaches and vast diversities of flora and faunas. On 26th March 2005, UniSZA is founded when Prime Minister Dato' Seri Abdullah Ahmad Badawi announced the formation of university. On 1st January 2006, the UniSZA's first Vice Chancellor, Dato' Professor Dr. Alias B. Daud was appointed. The university now operates under the motto "Knowledge for the Benefit of Humanity'. UniSZA aims to shape talented leaders who both knowledgeable and cultured with an international outlook.

UniSZA currently operates two campuses, namely Kota Campus and Gong Badak Campus. In the coming years, a third campus- Besut Campus begin its operation at Tembila. UniSZA Gong Badak Campus focuses on teaching and research in Islamic knowledge together with conventional studies. Kota Campus offer programmes in Medical while Besut Campus will specialized in agricultural fields such as biotechnology and other related courses. UniSZA aspires to be a world class institution of higher learning that produces and shapes talented leaders in various fields who are knowledgeable, refined, noble and an appropriate of diversity to benefit humankind.

1.2 Vision of UniSZA

Contemporary Integrated Islamic University (CIIU).

1.3 Mission of UniSZA

To produce holistic individuals with Naseem values through educational excellence and high impact research towards empowering society.



GENERAL INFORMATION OF THE FACULTY

1.1 Background history of its development

Faculty of Health Sciences officially began its operation on 1st September 2014. The faculty aims to produce more scholar in professional field like health sciences in Terengganu and country as well. By producing high quality graduates in these critical areas, UniSZA realize its visions to emerge as a higher learning institution with international standards capable of delivering leaders, processing highly-polished thinking infused with excellent level of knowledge and embedded with strong cultural as well as ethical principles.

2.2 General concept and scope of learning at FSK UniSZA

The curriculum of the health sciences in UniSZA is based on the University's motto of "Knowledge for the benefit of humanity". It will be based on the basic studies of human body and its dynamic interaction with the environment. Curriculum's contents hinges on strong scientific foundation, Islamic value, modern technology and understanding of art. The curriculum stipulates course hours, practical hours, seminars, tutorials and CLA. The knowledge, skills and attitudes in the intended learning objectives are evaluated formatively and summative throughout the health sciences course.

2.3 Vision of FSK

To become a centre of academic excellence producing holistic health professionals

2.4 Mission of FSK

Producing refined and proficient health sciences graduates in line with community needs through academic and research excellence.

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3. THE EDUCATIONAL PROGRAMME

3.1 Biomedical Sciences programme

Bachelor of Biomedical Sciences (Honours) programme at Faculty of Health Sciences of Universiti Sultan Zainal Abidin is a comprehensive programme which aims to enable the graduates to integrate a broad generic base of knowledge and skills in various fields affiliated to medical sciences and acquire competencies at an in- depth level in an area of choice. The program will also emphasize and equip the graduate with the skills needed for life-long learning, effective team work and scientific enquiry. The students are also equipped with knowledge of bioinformatics, bioethics, legal aspects of biomedical practice and entrepreneurial skills in order to prepare them for the future challenges.

The programme has been selected to by the university to be pioneer in implementing the integrated cumulative grade point average (ICGPA) that enforced by the ministry of higher education in line with Pelan Pembangunan Pendidikan Malaysia 2015-2025 in upbringing holistics graduates.

3.2 Programme Educational Objectives (PEOs)

PEO 1

Knowledgeable and technically competent in biomedical discipline in-line with the government and industry requirement.

PEO 2

Effective in communication and demonstrate good leadership quality in an organization.

PEO 3

Capable to solve community biomedical-related problems scientifically, creatively and ethically through sustainable approach.

PEO 4

Able to demonstrate entrepreneurship skills and recognize the need of life-long learning in biomedical sciences for successful career advancement.

3.3 Duration of the programme

This 4 year program comprises of general education and core biomedical science courses with all courses being mandatory. Students are required to submit a research project as part of program requirement. During the two short semesters, the student is rotated to various laboratories and / or medical diagnostics industry to gain on the job experience under the close supervision of his/her supervisors which serves to provide opportunities to attain appropriate higher level skills before they enter independent practice as laboratory and/or research personnel.

3.4 Career opportunities

Employment opportunities that can be pursued by graduates in Biomedical Sciences are:

- Clinical Biochemist
- Molecular Geneticist
- Forensic Scientist
- Microbiologist
- Immunologist
- Haematologist
- Toxicologist
- Research Scientist
- Bioinformatician
- Research scientist
- Medical sales representative
- More related scientist

3.5 Opportunities in furthering study

Students can continue their studies at a higher level such as, masters and doctorate programs in the following areas:

- Forensic Science
- Biomedical
- Medical
- Microbiology
- Toxicology
- Parasitology
- Pathology
- Biotechnology
- Genetics
- Biology

3.6 Admission requirement

STPM

- Pass SPM/relevant with credit in BM or BM kertas Julai
- Pass STPM with minimum credit CGPA 2.00 and grade C in three subjects including Pengajian Am
- minumum CGPA 3.00 in STPM
- minimum grade B in STPM in Biology, Chemistry and Physic/Mathematic/Add math
- minimum grade C in SPM in English, Math, Biology and Chemistry
- minimum band 3 in MUET
- not handicapped

MATRICULATION/FOUNDATION

- Pass SPM/relevant with credit in BM or BM Kertas Julai
- Pass Matriculation/foundation with a minimum CGPA 2.00
- minimum CGPA 3.00 in matriculation/foundation
- minimum grade B in Matriculation/foundation in Biology, Chemistry, Physic/Mathematics
- minimum grade C in SPM in subjects: English, Math, Biology, Chemistry
- minimum band 3 in MUET
- not handicapped

DIPLOMA

- Pass SPM/relevant with credit in BM/BM kertas Julai
- obtained diploma or any relevant qualification certified by the Malaysian goverment and approved by the university senate
- minimum CGPA 3.00 in relevant Diploma
- minimum grade C in SPM in English, Math, Biology, Chemistry
- minimum band 3 in MUET
- not handicapped

3.7 Programme Learning Outcomes (PLOs)

At the end of the program, graduates will be able to:

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

3.8 Structure of the curriculum

To qualify a student is awarded a Bachelor of Biomedical Science (from Universiti Sultan Zainal Abidin, students must successfully complete the program with at least 140 credit hours to graduate study within 4 years (10 semesters). There are two main courses, University Courses and Core Courses.

Candidates must achieve a pass standard of all courses offered to enable them to obtain a bachelor or at least C in each subject. All subjects were included with theoretical, practical and tutorials that will courage the students to get early exposure before moving to working environment.

The structure of the courses conducted are consistent with the goals to be achieved and is based on the following courses:

TOTAL	140 credit hours
Course Programme (Core Courses)	121 credit hours
University Course	19 credit hours

3.8.1 University subject (19 Credit hours)

NO	CODE	COURSE SUBJECT	CREDIT HOURS	SEMESTER	GROUP
1.	MPU 31022	T.I.T.A.S	2	1	No option
1.	MPU 32012	English For Communication 1	2	1	No option
2.	MPU 33022	Moral & Etika	2	2	Non- Muslims Student
3.	MPU 33012	Ilmu wahyu & Sains	2	2	Muslims Student
4.	Refer to curriculum courses offered	Co-curriculum	3	1	Co- curriculum course
5.	MPU32022	English For Communication 2	2	2	No option
6.	MPU33032/	Perbandingan agama	2	2	Non- Muslims Student
7.	MPU33042	Ilmu wahyu & kemasyarakatan	2	2	Muslims Student
8.	Refer a foreign language courses offered	Bahasa Asing	2	2	Foreign language course
9.	MPU31012	Hubungan etnik	2	3	No option
10.	MPU32092	Asas Pembudayaan Keusahawanan	2	3	No option
11.	MPU33050	Talaqi Al-Quran	Pass/ Fail	3	Muslims Student
12.	MPU33060	Protokol Pengurusan Majlis	Pass/ Fail	3	Non- Muslims Student

3.8.2 Course subject (Credit hours)

NO.	CODE	COURSE SUBJECT	CREDIT HOURS	SEMESTER	GROUP
1.	DBB10103	Anatomy & Physiology 1	3	1	No option
2.	DBB10203	Biochemistry & Basic Genetics	3	1	No option
3.	DBB10303	Basic Microbiology	3	1	No option
4.	DBB10502	Basic Immunology	2	1	No option
5.	DBB10403	Anatomy & Physiology 2	3	2	No option
6.	DBB10602	Laboratory Science	2	2	No option
7.	DBB10702	Human Biochemistry	2	2	No option
8.	DBB10803	Psychology & Behavioral Science	3	2	No option
9.	DBB10903	Basic Biostatistic	3	2	No option
10.	DBB20103	Human Genetics	3	3	No option
11.	DBB20203	Medical Microbiology	3	3	No option
12.	DBB20303	Biomedical Laboratory Management	3	3	No option
13.	DBB20403	Basic Pathology	3	3	No option
14.	DBB21103	Advanced Biostatistic	3	3	
15.	DBB20503	Basic Pharmacology	3	4	No option
16.	DBB20603	Clinical Biochemistry	3	4	No option
17.	DBB20702	Systemic Pathology	2	4	No option
18.	DBB20803	Intellectual Properties & Bioethics	3	4	No option
19.	DBB20903	Basic Hematology	3	4	No option
20.	DBB21003	Industrial Training	3	Short semester/5	No option
21.	DBB30103	Transfusion Science & Blood Banking	3	6	No option
22.	DBB30203	Advanced Hematology	3	6	No option
23.	DBB30303	Medical Parasitology & Entomolgy	3	6	No option
24.	DBB30403	Research Methodology	3	6	No option
25.	DBB30503	Laboratory Animal Science	3	6	No option

26.	DBB30603	Advanced Immunology	3	7	No option
27.	DBB30703	Molecular Biology Techniques	3	7	No option
28.	DBB30803	Toxicology	3	7	No option
29.	DBB30903	Health Informatics	3	7	No option
30.	DBB31103	Histological & Hsitopathological Techniques	3	7	No option
31.	DBB31208	Biomedical Practicum	8	Short Semester/8	No option
32.	DBB40103	Cytology & Cytophatology	3	9	No option
33.	DBB40206	Final Year Research Project 1	6	9	No option
34.	DBB40303	Tissue Banking	3	9	No option
35.	DBB40403	Epidemiology	3	9	No option
36.	DBB40506	Final Year Research Project 2	6	10	No option
37.	DBB40603	Special Topics In Biomedicine	3	10	No option
38.	DBB40703	Case Study/Problem Solving	3	10	No option

3.8.3 Structure of the curriculum by semester

FIRST YEAR

a) First semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
	MPU33032/ MPU 33022	ILMU WAHYU DAN KEMASYARAKATAN/ MORAL ETIKA	2
	PBI10102	ENGLISH FOR COMMUNICATION I	2
	MPU33012/ MPU33042	ILMU WAHYU DAN SAINS/ PERBANDINGAN AGAMA II	2
	PBI10202	ENGLISH FOR COMMUNICATION II	2
UNIVERSITY SUBJECTS	PBI****2	FOREIGN LANGUAGE	2
	MPU31062/ MPU31072	FALSAFAH DAN ISU SEMASA / PENGHAYATAN ETIKA DAN PERADABAN	2
	MPU31072	PENGHAYATAN ETIKA DAN PERADABAN	2
	MPU32092	ASAS PEMBUDAYAAN DAN KEUSAHAWANAN	2
	ККХХХОЗ	CO-CURRCICULUM	3
		TOTAL	19

*Subjects for Non-Muslim only

b) Second semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
	DBB10103	ANATOMY AND PHYSIOLOGY I	3
	DBB10203	BIOCHEMISTRY & BASIC GENETICS	3
	DBB10602	LABORATORY SCIENCE	2
CORE SUBJECTS	DBB10502	BASIC IMMUNOLOGY	2
	DBB10303	BASIC MICROBIOLOGY	3
	DBB10803	PSYCHOLOGY & BEHAVIORAL SCIENCE	3
	DBB10903	BASIC BIOSTATISTIC	3
		TOTAL	19

SECOND YEAR

a) Third semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
	DBB10403	ANATOMY AND PHYSIOLOGY II	3
	DBB10702	HUMAN BIOCHEMISTRY	2
CORE SUBJECTS	DBB20103	HUMAN GENETICS	3
	DBB20203	MEDICAL MICROBIOLOGY	3
	DBB20403	BASIC PATHOLOGY	3
	DBB21103	ADVANCED BIOSTATISTIC	3
		TOTAL	17

b) Fourth semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
	DBB20503	BASIC PHARMACOLOGY	3
	DBB20603	CLINICAL BIOCHEMISTRY	3
	DBB20702	SYSTEMIC PATHOLOGY	2
CORE SUBJECTS	DBB20803	INTELLECTUAL PROPERTIES & BIOECTHICS	3
	DBB20903	BASIC HAEMATOLOGY	3
	DBB20303	BIOMEDICAL LABORATORY MANAGEMENT	3
		TOTAL	17

c) Short semester/fifth Semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
CORE SUBJECT	DBB21003	INDUSTRIAL TRAINING	3
		TOTAL	3

a) sixth semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
	DBB30103	TRANSFUSION SCIENCE & BLOOD BANKING	3
	DBB30203	ADVANCED HEMATOLOGY	3
CORE SUBJECTS	DBB30303	MEDICAL PARASITOLOGY & ENTOMOLOGY	3
	DBB30403	RESEARCH METHODOLOGY	3
	DBB30503	LABORATORY ANIMAL SCIENCE	3
		TOTAL	15

b) Seventh semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
	DBB30603	ADVANCED IMMUNOLOGY	3
	DBB30703	MOLECULAR BIOLOGY TECHNIQUES	3
CORE SUBEJCTS	DBB30803	TOXICOLOGY	3
	DBB30903	HEALTH INFORMATICS	3
	DBB31003	HISTOLOGICAL & HISTOPATHOLOGICAL TECHNIQUES	3
		TOTAL	15

c) Short semester 2/eighth semester

CATEGORY	CODE	CODE NAME OF SUBJECT		
CORE SUBJECTS	DBB31108	BIOMEDICAL PRACTICUM	8	
		TOTAL	8	

FOURTH YEAR

a) Ninth semester

CATEGORY	CODE	NAME OF SUBJECT	CREDIT HOUR
	DBB40103	CYTOLOGY & CYTOPATHOLOGY	3
CORE SUBJECTS	DBB40206	FINAL YEAR RESEARCH PROJECT 1	6
	DBB40303	TISSUE BANKING	3
	DBB40403	EPIDEMIOLOGY	3
		TOTAL	15

b) tenth semester

CATEGORY	CODE	CREDIT HOUR	
	DBB40506	FINAL YEAR RESEARCH PROJECT 2	6
CORE SUBJECTS	DBB40603	SPECIAL TOPICS IN BIOMEDICINE	3
	DBB40703	CASE STUDY/PROBLEM SOLVING	3
		TOTAL	12

Total number of credits (upon graduation) = **140 credit hours**

				2	020	Alexa -									2021								
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DIP	Diploma (FSk	K) Program Acade	emic Calendar			Lecture			Lecture:	12 Aug	- 29 Sept 2	020			Lecture	: 14 Ju	ne - 1 Au	ug 2020					
	Mid Semester	r Break				Revision			Revision	1: 30 Se	ept - 3 Oct 2	020			Revisio	n: None	Э						
	Semester Bre	eak							Final Ex	am: 4 -	10 Oct 202	D			Final E	xam: 2	- 8 Aug 2	2020					

Semester Break: 11 - 17 Oct 2020

Academic Calendar Session 2020/2021

** Prepared based on Vice Chancellor Special Circulation No. 3/2020. Subjected to changes.

Semester Break: 9 - 11 Aug 2020

4. EVALUATION SYSTEM

To test the understanding of the subject being taught, a system of ongoing evaluation during the study session and also at the end of the study were applied. System evaluation is based on the system found in the Academic Regulations for Undergraduate, Universiti Sultan Zainal Abidin.

The assessment of a course depends on the objectives and course content. The ratio of contribution assessment methodology in the final grade will be determined by the faculty with the following conditions:

- a. Continuous Assessment (40-60%).
- b. Final Exam (40-60%).
- c. The course of a practical or project is assessed 100%.
- 4.1 First semester and other semester
 - Students with CGPA> = 2.00 is considered a pass and allowed to proceed to the next semester.
 - Students with 1.7 = <CGPA <2.0 is considered a conditional pass and placed under probation status. Students may be allowed to continue their studies and must have a CGPA of 2.0 and above. If they fail, they will be dismissed.
 - Students with CGPA <1.7 is considered failed and will be terminated (GB).
- 4.2 Evaluation to get the bachelor

A student must meet all the following requirements to be eligible to be awarded the bachelor with honours:

- a. Achieve a minimum cumulative grade point average of 2.00.
- b. Meet the number of credit hours as prescribed by the program.
- c. Complete Industrial Training

4.3 Grading Process

Mark	Grade	Score	Performance
80 – 100	А	4.00	Eveellent
75 – 79	A-	3.67	Excellent
70 – 74	B+	3.33	Cood
65 – 69	В	3.00	Guu
60 – 64	B-	2.67	
<u> 55 – 59</u>	C+	2.33	Maaliuma
<u> 50 – 54</u>	С	2.00	Medium
47 – 49	C-	1.67	
44 – 46	D+	1.33	
40 – 43	D	1.00	Failed
39 below	F	0.00	

* For more information, please refer to the 2020/2021 Academic Regulations for Undergraduate Universiti Sultan Zainal Abidin

SYNOPSIS OF CORE SUBJECTS

Code

Name of Subject

Credit Hours

DBB10103Anatomy & Physiology 13This subject offers the introduction to the structure of the human body and also the basic
principles of cellular and tissue. The human anatomy and physiology will include the study of
the basic introductory to human structure, function and also the system of human's body.
This course will enable student to apply anatomical knowledge learnt to their respective
professions, through integrated approach to the transfer of knowledge of the structure and
function of normal body system. The lecture will provide a framework of basic concepts in
regional anatomy physiology of body fluids, excitable tissues, integumentary, blood, nervous
system, cardiovascular systems, respiratory, immune, lymphatic, digestive, urinary,
endocrine and reproductive systems. This course will also emphasize on the relationship
between the structures and the function of the major organs in human's body.

Code	Name of Subject	Credit Hours
DBB10203	Biochemistry & Basic Genetics	3

This course shows link between elements, chemical and biological processes which occurred in the body. This course emphasizes on the classification, structures and functions of carbohydrates, lipids, proteins and nucleic acids as major biomolecules that are needed in an organism. This course will also describe the basic terminology of genetics, the principles in genetic make-up and the application of molecular technique in diagnosing genetic disease. This course also touches on importance of other biological sciences that students may apply in the research and other sciences field.

Code	Name of Subject	Credit Hours					
DBB10303	Basic Microbiology	3					
The basic microbiology consis	ts of lectures and practical. Th	ne course condenses pertinent					
topics from general microbiolog	gy that is useful in understandin	g the world of microorganisms,					
i.e., bacteria, fungi, and viruses	s. The lecture topics cover the i	nformation on the development					
of microbiology, taxonomy and	classification of microorganism	ns, microbial cell structures and					
related function, microbial nu	related function, microbial nutrition and growth, as well as microbial metabolisms and						
genetics. The practical emp	hasizes the microbiological	laboratory safety and other					
contamination preventive measurement (sterilization, disinfection, and antisepsis), as well as							
standard operation procedures (SOP) and techniques in cultivation and identification of							
microorganisms.							

Code	Name of Subject	Credit Hours
DBB10403	Anatomy & Physiology 2	3

This subject is the continuity from Anatomy & Physiology 1 subject. The topics will be covered include all organ system organization. This subject emphasizes onto macroscopic anatomy especially cardiovascular, digestive, urinary, endocrine and reproductive system as well as the microscopic and histology of blood, nephron, renal, digestive and reproductive organs.

Code	Name of Subject	Credit Hours
DBB10502	Basic Immunology	2

The course contains the knowledge about basic principle of immunology. It introduces students to the basic understanding of body's defence system and the involved components. Students will be exposed with general terms in immune system at the beginning of the course. The main topic covers the characteristic of innate and adaptive immunity and their roles in immune system. It also includes the basic knowledge about the types and characteristics of antigen and antibodies. Besides, students also will learn the other immune response mechanisms that include complement system and the types of hypersensitivity.

Code	Name of Subject	Credit Hours
DBB10602	Laboratory Science	2

This course includes the knowledge in laboratory mathematical subject and techniques in apparatus device operation and instrumentation laboratory that should be mastered by students. It includes laboratory basic equipment topic and laboratory mathematical basis like basic unit, solution density, pH, standard curve and mathematical application in management of laboratory. Apart from that, security aspects and laboratory equipment operations also given emphasis. This course will give exposure on the usage of basic skill laboratory equipment by applying mathematical ability in material preparation and handling of equipment for laboratory test.

Code	Name of Subject	Credit Hours		
DBB10702	Human Biochemistry	2		

This course aims to explain the involvement of major biomolecules and micronutrients such as carbohydrates, lipids, proteins, nucleic acids, vitamins and minerals in metabolic pathways, and understand the biological significance of their products. An integrated view of metabolism and their regulation under different physiological and pathological conditions is also discussed.

Code	Name of Subject	Credit Hours
DBB10803	Psychology & Behavioural Science	3

This course covers the basic knowledge on psychology, developmental personality, stress management, learning and memory, motivation, perception and behaviour.

Code	Name of Subject	Credit Hours
DBB10903	Basic Biostatistics	3
This course dives exposure to	students on techniques to cor	duct research. Student will be

This course gives exposure to students on techniques to conduct research. Student will be taught on how to create research blue-print, research proposal, and create research questionnaires.

Code	Name of Subject	Credit Hours
DBB20103	Human Genetics	3

This course expose the students on the classification of hereditary diseases, the techniques in diagnosing the diseases and the application of human genetics in determining the disease based on the modification of genes and chromosomes. This course educates the students on the importance of early detection of genetic disease and the management of the diseases.

Code	Name of Subject	Credit Hours
DBB20203	Medical Microbiology	3

Medical microbiology course emphasise the preventive, diagnosis, and treatment of infectious diseases, particulary caused by th pathohgenic microorganisms, i.e., bacteria, fungi, and viruses in human illness. This couse also explain the roles of microbes as a part of normal flora in human body system and explain on how in some circumstances, its turn to be pathogenic to human. The course also covers the pathogen- host interaction, pathogenesis of the diseases, mechanism of antimicrobial resistance, as well as the speading of the diseases in the communities and clinial settings. Topics also cover an overview of pathogenic infections occur in specific body system and routine identification procedures used in clinical diagnostic laboratory. The procedures encompassing specimen collection to sample processing such as routine cultivation of microorganisms, presumptive identification, final identification, and antimicobial susceptibility testing. This course also covers the principle and application of the serological tests and molecular diagnostic techniques in clinical microbiology laboratories.

Code	Name of Subject	Credit Hours
DBB20303	Biomedical Laboratory Management	3

The course will introduce laboratory management system in general and quality system that consist of ISO 9001, ISO/IEC 15189, total quality management (TQM). Students also will be learned about important aspect in work health safety and environment management.

Code	Name of Subject	Credit Hours
DBB21103	Advanced Biostatistics	3
This servers smallesters on the same and smallesting of CDCC are presented. The servers server		

This course emphasizes on theory and application of SPSS programme. The course covers various application of statistic to be applied in biomedical research.

Code	Name of Subject	Credit Hours
DBB20403	Basic Pathology	3
This course covers the basic k	nowledge on diseases-definition	on, classification, pathogenesis
of the disease. The course content also describes the cellular and histological changes due		
to disease pathogenesis.		

Code	Name of Subject	Credit Hours
DBB20503	Basic Pharmacology	3

This course offers the basic principle of pharmacology that includes pharmacodynamic and pharmacokinetic concept. The students will be exposed with the understanding mechanism of drugs that act on central and autonomic nervous system. Besides, it also explains systemic pharmacology and side effects of each drug that covered in this course.

Code	Name of Subject	Credit Hours
DBB20603	Clinical Biochemistry	3

The syllabus of this subject is designed for easy understanding of the daily routine tests that are performed in the clinical biochemistry laboratory and their significance. This course will discuss different types of diseases that requires adequate diagnostic laboratory information and how the interpretation of these information in making clinical decision. The practical sessions in this course enables students to master laboratory skills in routine biochemical tests and to analyse the test result accurately.

Code	Name of Subject	Credit Hours
DBB20702	Systemic Pathology	2

This topic describes the pathogenesis of disease in body system and student should be able to differentiate the normal tissue with the pathological tissue. The students will be exposed with appropriate laboratory tests for these diseases.

Code	Name of Subject	Credit Hours
DBB20803	Intellectual Properties & Bioethics	3

The procedure of tissue banking not only involves the high skilled of technologist but also need trust, sincerity, confidential, ethics and safety of storing material. This subject is an intensive introduction to the law of intellectual property, with major emphasis on Malaysian as well as international patent law. The course also focuses on copyrights, provides a brief look at trademarks and trade secrets, presents comparisons of what can and cannot be protected, and what rights the owner does and does not obtain. Issues relating to information technology, biogenetic materials, and business methods are highlighted. This course emphasizes the standard procedure starting from taking consent form of individual or family member, collecting human tissues and process the tissue under good manufacturing practice before banking the tissue for clinical application.

Code	Name of Subject	Credit Hours
DBB20903	Basic Haematology	3
Basic Haematology will provide	e the students with theoretical	and practical knowledge of the
haematopoietic system, cell dif	ferentiation, structure and funct	tion of blood cells, metabolisms
of iron, vitamin B12 and folate	, haemoglobin synthesis and h	naemostasis. The students will
learn how to identify various	types of blood cells and dev	elop ability in haematological
techniques conducted in haem	natology laboratory, including b	lood collection procedures, full
blood count, blood films and	bone marrow preparation, leu	kocytes differential count, and
staining methods for microsc	opy. Particular emphasis will	be given to a few important
concepts in haematology suc	ch as investigation and unde	rstanding of anaemias, basic
leucocyte disorders, and coa	agulation/heamostasis This co	ourse will also introduce the
students to basic laboratory	management, quality assure	ance and automation in the
haematology laboratory.		

Code	Name of Subject	Credit Hours
DBB21003	Industrial Training	3
This course involves of theo	ry and practical regarding to	function, principles, handling
technique in laboratory test in industry, safety and laboratory management as well. This		
course will expose the student	ts with problem solving technic	up communication and ethics

course will expose the students with problem solving technique, communication and ethics in the real working area as well as engaging with life-long learning.

Code	Name of Subject	Credit Hours
DBB30103	Transfusion Science & Blood Banking	3

This course covers the theory and practical of immunology and genetic of human blood groups, blood components and all the test that are related to blood transfusion services. The students will be provided with knowledge, practical and management that are used in blood transfusion practices.

Code	Name of Subject	Credit Hours
DBB30203	Advanced Haematology	3
In this course, major haematol	ogic abnormalities based on th	e discovery of abnormalities o
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blood cells in the blood smear are emphasized. Anaemia and leukaemia are also studied in greater depth and cytochemical staining is introduced. The course also examines the shortcomings associated with blood clotting; in theory and practical application. Blood diseases and related laboratory tests are also discussed.

Code	Name of Subject	Credit Hours
DBB30303	Medical Parasitology & Entomology	3

Medical parasitology and entomology are a course designed to help students understand the foundations in the field of parasitology and entomology, the terms related diseases and pathophysiology of human infections and parasitic morphology. Students will also be applied with a basic knowledge of application-related instrumentation and sample collection methods for diagnosis of disease.

Code	Name of Subject	Credit Hours
DBB30403	Research Methodology	3

This course covers the basic knowledge of research for biomedical students. This course involves the software that effectively helpful in producing the scientific writing and the latest technique used before and after collecting research data. All hands-on session are important in analysis of data for scientific writing purposes. All students are expected to be able in producing the research proposal and scientific writing which is very important in tertiary education.

Code	Name of Subject	Credit Hours
DBB30503	Laboratory Animal Science	3

Topics include the basic knowledge of small laboratory animal handling and management, hygienic aspect of animal cages and the importance of animal ethics. The students will also be exposed to comprehensive knowledge of animal blood collection for research purpose.

CodeName of SubjectCredit HoursDBB30603Advanced Immunology3

This course covers the main aspects of Immunology at an advanced level. The first part of the course gives an introduction to cellular immunology: the cell types involved in immune responses, the interactions between these cells during immune and inflammatory responses, and the mechanisms of host response against infectious pathogens. The role of the immune system in human health and disease is described in detail, with examples showing how the immune dysfunction leads to chronic inflammatory diseases such as rheumatoid arthritis and asthma, cancer immunology, immunogenetics and immune deficiency. Throughout the course students will also learn about applied immunology, with practical on polyclonal antibody production and introduction on single cell analysis using flow cytometry technology.

Code	Name of Subject	Credit Hours
DBB30703	Molecular Biology Techniques	3

This course is the extension to latest techniques in molecular biology. The students will be exposed to application of the techniques in the real laboratory workspace. The students are hoped to apply the knowledge in managing problems in medical genetics.

Code	Name of Subject	Credit Hours
DBB30803	Toxicology	3

This course provides general knowledge about the toxicology involving lectures, tutorials, and a laboratory session. The basic principle of toxicology will be explained in the beginning of the course which includes of toxicodynamic and toxicokinetic. The method of toxicology such as the toxicological mechanisms of action of various toxic agents, injury and cell death are also included. The next part of this course is more specific to toxic agents/toxins such as carcinogens, natural toxins, pesticides, heavy metals and radioactive materials. This course will also highlight on the toxicology test - toxicity testing, toxicology and legal aspects and gene toxicity.

Code	Name of Subject	Credit Hours
DBB30903	Health Informatics	3

This course presents the fundamental principles, concepts, and technological elements that make up Health Informatics. It introduces fundamental characteristics of data, information, and knowledge in the domain and information technology (IT) components in representative clinical processes. It also introduces the conceptual framework for handling the collection, storage and the optimal use of biomedical data.

Code	Name of Subject	Credit Hours
DBB31103	Histological & Histopathological Techniques	3

This course provide student with the basic knowledge of histology and histopathology of human tissue from human body system using histopathological techniques such as sample collection, the process of tissue processing, staining and histological slide interpretation. 3

Code	Name of Subject	Credit Hours
DBB31208	Biomedical Practicum	8

This course involves of theory and practical regarding to function, principles, handling technique in laboratory test in industry, safety and laboratory management as well which consist in haematology, blood bank, histopathology, cytology, chemical pathology, microbiology, parasitology and forensic. This course will expose the students with laboratory technique, communication and ethics in the real working area as well as engaging with lifelong learning.

Code	Name of Subject	Credit Hours
DBB40103	Cytology & Cytopathology	3

This course also covers the basic knowledge on normal cytology and cytopathology of gynae and non-gynae samples. The interpretation is based on Bethesda's system.

Code	Name of Subject	Credit Hours
DBB40206	Final Year Research Proiect 1	6

Biomedicine undergraduate students are required to do a scientific research project on different fields that could be divided into two parts, Final Year Research Project I and 2. Final Year Research Project I, usually conducted in 4th year, 1st semester and student will start reading on literature review to determines the need and scope of the research. Then, student start writing the proposal with different parts including; literature review, objective, methodology and milestones. After that, students present their proposals and start data collection. All the findings collected will be analysed and discussed in the Final Year Research Project 2. Therefore, the student will get advanced professional training, research skill and improved knowledge to conduct independent research in specific field.

Code	Name of Subject	Credit Hours
DBB40303	Tissue Banking	3
The presedure of tissue heads	na not only involved the high	alvillad of toologiat but alo

The procedure of tissue banking not only involves the high skilled of technologist but also need trust, sincerity, confidential, ethics and safety of storing material. This course emphasizes the standard procedure starting from taking consent form of an individual or family member, collecting human tissues and process the tissue under good manufacturing practice before banking the tissue for clinical application.

Code	Name of Subject	Credit Hours
DBB40403	Epidemiology	3

This course consists of basic epidemiological topics needed to understand the causes, distribution and disease control methods. The course consists of lectures, which consists of a descriptive study, analytical studies, experimental studies of screening in the detection of disease, infectious disease epidemiology, risk management and other studies in epidemiology. Finally, the course also consists of lectures focus on the study of pathology, etiology, route of transmission, impact of the disease and the strategies in line to the zoonotic and infectious disease eradication and control.

Code	Name of Subject	Credit Hours
DBB40506	Final Year Research Project 2	6

In Final Year Research Project 2, the students will be implemented to get experiences in different scientific theoretical and practical techniques. Thus, they are required to have some courses in basic and intermediate statistics in order to be able to analyse their data gathered from the Final Year Research Project 1. The statistical procedure will provide the students with objective and systematic methods for describing and interpreting the results. Therefore, students will improve their skills in scientific and technical report writing and presentation. It will be also great benefit for students in the future to achieve higher education, MSc or PhD.

Code	Name of Subject	Credit Hours
DBB40603	Special Topics in Biomedicine	3

The special topic in Biomedicine is fundamental exposure to the applied sciences students. The explanation in the related topics is aimed to develop the latest skill and integrity particularly if the issue involves the native or modified of human or animal material.

Code	Name of Subject	Credit Hours
DBB40703	Case Study / Problem Solving	3

This course covers the theory and knowledge integration in Biomedical Sciences through problem-based learning. This course also fosters critical thinking, teamwork and knowledge sharing amongst students by troubleshooting problems in the case study.