



**USM** UNIVERSITI  
SAINS  
MALAYSIA



# UNIVERSITI SAINS MALAYSIA LABORATORY AND NON-LABORATORY **SERVICES**



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## Introduction

Universiti Sains Malaysia (USM) was established as the second university in the country in 1969. USM offers a range of courses, undergraduate and postgraduate programmes to students; provides consultancy, testing, and advisory services to the industry and public.

As a Research-Intensive University and with 17 dedicated research centres for a wide range of specialisations, USM offers educational and research opportunities to students, staff and industry. USM also became the first university in the country to be selected and to participate in the Accelerated Programme for Excellence (APEX), a fast-track programme that helps tertiary institutions achieve world-class status.

In promoting a research-intensive university culture, state-of-the-art R&D facilities are one of the key factors to facilitate effective research and technology transfer. This includes the provision of high-tech laboratory facilities with advanced equipment and infrastructure.

USM's research laboratories and services are ready to offer laboratory and non-laboratory related services to researchers, external parties and industry in performing various types of analysis.

There are laboratory and specialist facilities from the school and research institutes/centers that offer analytical services and research in their respective fields as which listed in this e-booklet.

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# LABORATORY SERVICES





# ADVANCED MEDICAL AND DENTAL INSTITUTE (AMDI)

AMDI is a research institute focusing on three key components which are clinical services, research activities and postgraduate academic programs. This institution aims to produce competent, holistic and modern medical as well as dental specialist equipped with state-of-the-art practices, who are also capable to lead new discoveries for global benefit.

The key factor of AMDI's research aspects has led to the establishment of research clusters aimed at driving advanced research in medicine, dentistry and health in order to fulfill not only for Malaysia's needs but regional and global countries as well.

AMDI also has various laboratories equipped with analytical equipments. To optimize the use of these equipments, AMDI offers various services — analytical, training, consultation and guidance to postgraduate students. Listed below are the laboratories available at AMDI, the services offered by each laboratory and also the advanced equipment available in these laboratories.



### a. Central Research Laboratory (CRL)

CRL, AMDI provide laboratory facilities and equipments for research and services. CRL also provide training, consultation and guidance to students and researchers to operate low and high-end equipments.

Non-Accredited Services	
1.	Molecular Biology ( <i>Proteomic &amp; Genomic</i> )
2.	Cell Culture ( <i>Non-Infectious &amp; Infectious</i> )
3.	Analytical Chemistry
4.	Biomaterial ( <i>Biomaterials Synthesis</i> )
5.	Nutritional and Physiology
6.	Bioinformatics & Medical Physics
7.	Honey Testing

List of Instruments	
1.	Molecular Biology
	■ Flow cytometry with Cell Sorter/Moflo (Beckman Coulter)
	■ Flow cytometer (BD)
	■ Phase Contrast Inverted Microscope (Olympus)
	■ UV Fluorescence Microscope (Olympus)
	■ Real Time PCR with Working Station (Bio-Rad)
	■ Phase Contrast Microscope (Olympus)
	■ Spot Cutter (Bio Rad)
	■ High Content Imaging System (Perkin Elmer)
	■ Microscope with Laser Dissection System (Zeiss)
	■ Microscope with Microinjector and Micromanipulator System (Zeiss)
	■ Fast Protein Liquid Chromatography (Ge Healthcare)
	■ Ultracentrifuge (Beckman Coulter)
	■ Gel and Blot Imaging System (Alpha Innotech)
	■ PCR Machine (Bio-Rad)
	■ Gene Pulser Xcell Electroporation System (Bio-Rad)
	■ Molecular Imager Versadoc Mp Imaging System (Bio-Rad)
	■ Gel Imaging System (Bio-Rad)
	■ Real-Time PCR (LC480)
	■ Microplate Reader (BMG)
	■ Capillary Electrophoresis System (Agilent)
2.	Cell Culture Facilities (Non-Infectious & Infectious)
	■ Biosafety Cabinet, Microscope, Water bath, CO <sub>2</sub> Incubator, Incubators
3.	Analytical Chemistry
	■ High Performance Liquid Chromatography System (Varians)
	■ Gas Chromatography Mass Spectrometry (Agilent)
	■ Thin Layer Chromatography System (Camag)
	■ Liquid Chromatography Time-Of-Flight Mass Spectrometry System (Waters)
	■ Gas Chromatography-Flame Ionization Detector (GC-FID)

	<ul style="list-style-type: none"> <li>■ High Performance Liquid Chromatography System &amp; Preparative Chromatography System (Agilent)</li> </ul>
4.	Biomaterial (Biomaterials Synthesis)
	<ul style="list-style-type: none"> <li>■ Analytical Mill (Ika-Werke)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Herb Grinder (Retsch)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Sample Concentrator (Genevac)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Reactor Vessel Control System Digital Circulating Water Bath (Bison Gear, Wisecircu)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Rotary Evaporator (Buchi)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Research Stereo Microscope (Olympus)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Handheld Homogenizer (Ika)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Freezer Dryer (Christ)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Ultrasonic Homogenizer (Biologics, Inc)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Parallel Synthesizer (Radleys)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Colony Counter (Uvp)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Handheld Cell Counter (Milipore)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Particle Size Analyzer (Malvern)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Microplate Reader (Bmg Labtech)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Grinder Polisher (Buehler)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Grinding Machine (Fritsch)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Low Speed Precision Saw (Buehler)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Porcelain Furnace (Carbolite)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Bottom Loading Furnace (Carbolite)</li> </ul>
5.	Nutritional and Physiology
	<ul style="list-style-type: none"> <li>■ Fibertech System (Gerhardt)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Lode High Performance Bike (Lode)</li> </ul>
	<ul style="list-style-type: none"> <li>■ CO<sub>2</sub> Analyzer (Aei)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Metabolic Measurement System Analyzer (Parvomedic Trucone 2400)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Heavy Duty Treadmill (H/P Cosmos)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Lactate Analyzer (Ysi)</li> </ul>
	<ul style="list-style-type: none"> <li>■ UV Spectrophotometer (Prisma)</li> </ul>
	<ul style="list-style-type: none"> <li>■ Body Composition Analyzer (Bod Pod)</li> </ul>

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## b. Animal Research Section (ARS)

We provide service for laboratory animal procurement, housing, veterinary research support and collaboration. We also offer training in various technical and experimental procedures and GLP testing for pharmaceutical products, medical devices, pesticides and industrial chemical.

Accredited Services	
1.	Toxicity Studies
2.	Bio-compatibility Studies

Non-Accredited Services	
1.	Laboratory animal supply/procurement
2.	Animal experiment rooms packages
3.	Veterinary research technical support
	■ veterinary care and husbandry
	■ surgery support
	■ various laboratory animal procedures
	■ euthanasia
	■ necropsy
4.	Animal research support facility
	■ surgery room
	■ necropsy room
	■ carcass storage and disposal
	■ cage sanitation
5.	Laboratory Animal Training Packages
6.	Histology laboratory

List of Instrument	
1.	Metabolic cages for mice and rats
2.	IVC caging system
3.	Microtome
4.	Tissue embedding
5.	Conventional rabbit caging
6.	Conventional rodent caging

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### c. Advanced Diagnostic Laboratory (ADL)

ADL provides medical laboratory services in Integration Lab (Haematology and Chemical Pathology) Genetics, Histopathology and Cytology, Microbiology, Transfusion Medicine, Molecular Diagnostics and Immunology. Our customers include AMDI wards/clinics, government hospitals/clinics/ laboratories and private hospitals/clinics/laboratories.

To achieve quality services in line with international practice, ADL is committed to:

- providing professional services, ensuring accurate and precise results in accordance with international standard methodologies,
- implementing a quality management system, which is compiled to MS ISO 15189 so as to ensure management plans and technical operations are established and controlled,
- ensuring all personnel who are involved in examination activities are familiar with the Laboratory Quality Management System (LQMS), and implement the possible process at all the time, and
- ensuring continual improvement of its LQMS.

### d. Integration Unit (Chemical Pathology)

Accredited Services	
1.	Routine Chemistry Test
■	Renal Function Test (Sodium, Potassium, Chloride, Urea, Creatinine, Uric Acid, Calcium, Inorganic Phosphate)
■	Liver function test (Total Protein, Albumin, Total Bilirubin, Direct Bilirubin, ALT, ALP, AST)
■	Lipid profile (Triglyceride, Total Cholesterol, HDL, LDL)
■	Cardiac markers (AST, Creatinine Kinase, LDH)
■	Amylase
■	Glucose
■	Magnesium
2.	Immunoassay
■	Tumour markers (Ca 125, CEA, Total PSA)
■	Hormones (TSH, fT4 and fT3)
■	Iron studies (Ferritin)

Non-Accredited Services	
1.	Tumour markers (AFP and BHCG)
2.	HbA1c
3.	CRP
4.	Blood Gas analysis (pH, pO <sub>2</sub> , pCO <sub>2</sub> , HCO <sub>3</sub> <sup>-</sup> , BE, lactate, glucose, sodium, potassium, calcium)
5.	Urine Analysis (biochemistry and microscopy)
6.	Urine Drug (cannabis, morphine, amphetamines)
7.	Urine Pregnancy Test

List of Instruments	
1.	Chemistry Analyser (Beckman Coulter AU680 / AU400)
2.	Immunoassay Analyser (Architect i2000SR)
3.	HbA1c Analyser (Alere Afinion)
4.	Urine Analyser
5.	Blood Gas Analyser
6.	Cardiac Meter (Trop T)

For further information, please contact:

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13200 Kepala Batas, Pulau Pinang, Malaysia  
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#### e. Integration Unit (Haematology)

Accredited Services	
1.	Full Blood Count (FBC)
2.	Full Blood Picture (FBP)

Non-accredited Services	
1.	Coagulation Test
2.	D-dimer
3.	ESR Test

List of Instrument	
1.	Haematology Analyser
2.	Coagulation Analyser
3.	ESR Analyser

For further information, please contact:

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#### f. Transfusion Medical Unit

Accredited Services	
1.	Blood grouping
2.	Rhesus Typing
3.	Direct Coombs Test
4.	Indirect Coombs Test/Antibody Screening

Non-Accredited Services	
1.	Antibody Identification
2.	Antigen Phenotyping
3.	Antibody Titre
4.	Adsorption and Elution Test
5.	Stem Cell Collection
6.	Blood Component
7.	Apheresis
8.	Irradiation Services

List of Instrument	
1.	Spectra Optia Apheresis System (apheresis & cell collection)
2.	Contact Shock Freezer

For further information, please contact:

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#### g. Microbiology Unit

Accredited Services	
1.	Bacteriology
	<ul style="list-style-type: none"> <li>■ Culture and sensitivity for (Blood, Urine, Sputum, Stool, Cerebrospinal fluid (CSF), Pus (wound) swabs, Aspirates from abscesses or deep wound, Tissue &amp; Biopsy, Conjunctival (eye) Swab, Throat swab, Ear Swab, catheter tips, High vaginal swab, Urethral swab (male), Sterile body fluids (pleural, pericardial, synovial, intraocular fluid, peritoneal), Nasal swab for MRSA Screening, Endotracheal Tube (ETT) secretions (tracheal aspirate), Bronchiol Alveolar Lavage (BAL)/Bronchial Washing/Bronchial Brushing).</li> </ul>

Non-Accredited Services	
1.	Mycobacteriology Test
	<ul style="list-style-type: none"> <li>■ AFB Smear</li> </ul>
2.	Serology
	<ul style="list-style-type: none"> <li>■ Hepatitis B surface antigen (HBsAg)</li> <li>■ Hepatitis B surface antibody (anti-HBs)</li> <li>■ Immunodeficiency virus antigen/ antibody (HIV Ag/Ab)</li> <li>■ Hepatitis C virus antibody (anti-HCV)</li> <li>■ RPR anti-nontreponemal screening for syphilis</li> <li>■ Treponema pallidum particle agglutination (TPPA)</li> <li>■ Dengue NS1/IgM/IgG</li> </ul>
3.	Parasitology
	<ul style="list-style-type: none"> <li>■ Blood film for malarial parasites (BFMP)</li> </ul>

List of Instrument	
1.	Vite
2.	Biosafety cabinet Class 2
3.	Biomic
4.	Bactex FX

For further information, please contact:

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## h. Genetics Unit

Accredited Services	
1.	Cytogenetic (peripheral blood)
2.	Molecular Cytogenetic - Fluorescent In Situ Hybridization (FISH)
	■ Microdeletion syndromes (e.g. Williams syndrome, Prader Willi syndrome, DiGeorge syndrome)

Non-Accredited Services	
1.	Cytogenetic (bone marrow)

List of Instrument	
1.	Karyotyper
2.	CO <sub>2</sub> Incubator
3.	FISH Slide Processing System
4.	Fluorescent Microscope

For further information, please contact:

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## i. Molecular Diagnostics Unit

Non-Accredited Services	
1.	DNA Extraction
2.	PCR Southeast Asian Ovalocytosis
3.	PCR Sex-determining Y gene
4.	Molecular Alpha Thalassaemia

List of Instrument	
1.	Thermal Cycler (PCR Machine)
2.	Genetic Analysis System
3.	DNA Microarray Scanner
4.	Bioanalyzer

For further information, please contact:

Molecular Diagnostics Unit, Advanced Diagnostic Laboratory,  
Clinical Trial Complex,  
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## j. Histopathology and Cytology Unit

<b>Accredited Services</b>	
1.	Routine Diagnostic Histopathology
2.	Histochemistry
3.	Immunohistochemistry

<b>Non-Accredited Services</b>	
1.	Non-Gynaecologic Cytology:
	■ Bile duct brushings
	■ Bronchiole brushings and washings
	■ Cerebrospinal fluid
	■ Esophageal brushing
	■ Gastric brushing
	■ Pericardial fluid
	■ Peritoneal fluid
	■ Pleural fluid
	■ Sputum cytology
	■ Urinary tract specimen
2.	Gynaecologic Cytology
	■ Cervical smear
3.	Fine Needle Aspiration Cytology (FNAC)

<b>List of Instrument</b>	
1.	Tissue Processor
2.	Tissue Embedding Center
3.	Microtome Instrument Set
4.	Pathology Grossing Station
5.	Autostainer
6.	Trinocular Microscope with Camera
7.	Cytospin

For further information, please contact:

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## k. COVID-19 Molecular Unit

<b>Non-Accredited Services</b>	
1.	RTPCR COVID-19
2.	RTK Antigen COVID-19

List of Instrument	
1.	Biosafety Cabinet Class II
2.	Minus 80°C Freezer
3.	Real Time PCR Machine

For further information, please contact:

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## I. Immunology Unit

Non-Accredited Services	
1.	Allergy test
	<ul style="list-style-type: none"> <li>■ Total IgE</li> <li>■ Specific IgE - Allergen d1- (<i>Dermatophagoides pteronyssinus</i>)</li> <li>■ Specific IgE - Allergen d2- (<i>Dermatophagoides farinae</i>)</li> <li>■ Specific IgE - Allergen d201- (<i>Blomia tropicalis</i>)</li> <li>■ Specific IgE - Allergen e1- (Cat Dander) - <i>Felis catus</i></li> <li>■ Specific IgE - Allergen e215- (Pigeon Feathers) - <i>Streptopelia</i> spp</li> <li>■ Specific IgE - Allergen f1- (Egg White) - <i>Gallus domesticus</i></li> <li>■ Specific IgE - Allergen f2- (Milk) - <i>Bos</i> spp.</li> <li>■ Specific IgE - Allergen f3- (COD Fish) - <i>Gadus morhua</i></li> <li>■ Specific IgE - Allergen f4- (Wheat) - <i>Triticum aestivum</i></li> <li>■ Specific IgE - Allergen f9- (Rice) - <i>Oryza sativa</i></li> <li>■ Specific IgE - Allergen f13- (Peanut) - <i>Arachis hypogaea</i></li> <li>■ Specific IgE - Allergen f14- (Soya Bean) - <i>Glycine max</i></li> <li>■ Specific IgE - Allergen f23- (Crab) - <i>Chionoecetes</i> spp.</li> <li>■ Specific IgE - Allergen f24- (Shrimp) - <i>Pandalus borealis</i>, <i>Penaeus monodon</i>, <i>Metapenaeopsis barbata</i>, <i>Metapenaeus joyneri</i></li> <li>■ Specific IgE - Allergen f27- (Beef) - <i>Bos</i> spp.</li> <li>■ Specific IgE - Allergen f41- (Salmon) - <i>Salmo salar</i></li> <li>■ Specific IgE - Allergen f58- (Pasific Squid) - <i>Todarodes pacificus</i></li> <li>■ Specific IgE - Allergen f75- (Egg Yolk) - <i>Gallus</i> spp.</li> <li>■ Specific IgE - Allergen f83- (Chicken Meat) - <i>Gallus domesticus</i></li> <li>■ Specific IgE - Allergen f93- (Cacao) - <i>Theobroma cacao</i></li> <li>■ Specific IgE - Allergen f207- (Clam) - <i>Ruditapes</i> spp.</li> <li>■ Specific IgE - Allergen f300- (Goat's Milk)</li> <li>■ Specific IgE - Allergen f313- (Anchory)</li> <li>■ Specific IgE - Allergen GX2- (Mix Grass Pollen) - Bermuda grass, Rye grass, Timothy grass, Meadow grass, Johnson grass, Bahia grass</li> <li>■ Specific IgE - Allergen I6- (Cockroach) - <i>Blatella germanica</i></li> <li>■ Specific IgE - Allergen K82- (Latex) - <i>Hevea brasiliensis</i></li> </ul>



<ul style="list-style-type: none"> <li>■ Specific IgE - Allergen MX2- (Mix Fungi) – <i>Penicillium chrysogenum</i>, <i>Cladosporium herbarum</i>, <i>Aspergillus fumigatus</i>, <i>Candida albicans</i>, <i>Alternaria alternata</i>, <i>Setomelanomma rostrate</i></li> </ul>
2. Specific Antibody Response (SAR)
<ul style="list-style-type: none"> <li>■ Specific Antibody Response (Pre and Post)- Tetanus</li> </ul>
<ul style="list-style-type: none"> <li>■ Specific Antibody Response (Pre and Post)- Pneumovax</li> </ul>

List of Instrument
1. Allergy and autoimmunity analyser
2. ELISA Reader

For further information, please contact:

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## ANALYTICAL BIOCHEMISTRY RESEARCH CENTRE (ABrC)

Analytical Biochemistry Research Centre (ABrC) is dedicated to fulfilling the need of the industry, research community and advancement of knowledge in ensuring public health and safety, the sustainability of our environment and the discovery of innovative technologies to the wellbeing of the society. ABrC is offering the following services:

- a. Workplace safety
- b. Environmental toxicology
- c. Food safety and security
- d. IRMS services
- e. NMR services

Accredited Services	
1.	Analysis of Morphine and Codeine in Urine
2.	Analysis of $\Delta$ 9-Carboxy-THC in Urine
3.	Analysis of Amphetamine, Methamphetamine, Methadone, Phencyclidine, Propoxyphene, Ketamine, MDMA, MDA and MDEA in Urine
4.	Analysis of Benzodiazepines in Urine
5.	Analysis of Benzoyllecgonine in Urine
6.	Analysis of Barbiturates in Urine
7.	Analysis of Amphetamine and Methamphetamine Enantiomers in Urine
8.	Analysis of Ethanol in Blood
9.	Determination Analysis of 3-Monochloropropane-1,2-Diol (3-MCPD) and Percent Dry Matter in Soy Sauce, Seasoning Powder, Caramel, Maltodextrin and Glucose
10.	Analysis of Polyaromatic Hydrocarbons in Fish
11.	Qualitative Analysis of Steroids and Stilbenes in Fish
12.	Analysis of Aristolochic Acid in Powder, Liquid and Root

<b>Non-Accredited Services</b>	
1.	Analysis of Steroids and Stilbenes in Feed
2.	Analysis of Growth Promoter in Animal Feed Sample
3.	Analysis of Sibutramine in Supplement
4.	Analysis of Sildenafil and Analog, Tadalafil and Vardenafil in Supplement
5.	Analysis of Corticosteroids in Supplement
6.	Analysis of Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) in Food and Air, and Polychlorobiphenyls (PCBs) in Food
7.	Analysis of Mitragynine in Urine and Water
8.	Analysis of Hydrocodone, Oxycodone, Hydromorphone, Oxymorphone and 6-Acetylmorphone in Urine
9.	Analysis of C-4 Plant Sugars in Honey
10.	Analysis of Ketamine in E-Cigarette Liquid
11.	Isotope Ratio Mass Spectrometry (IRMS) Analysis
12.	Nuclear Magnetic Resonance (NMR) Analysis

<b>List of Instrument</b>	
1.	Gas Chromatography Mass Spectrometry (GC-MS)
2.	Gas Chromatography Tandem Mass Spectrometry (GC-MS/MS)
3.	Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)
4.	Headspace Gas Chromatography Flame Ionization Detector (HS-GC-FID)
5.	Isotope Ratio Mass Spectrometry (IRMS)
6.	Nuclear Magnetic Resonance (NMR)
7.	Accelerated Solvent Extraction (ASE)

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 +6(04)-653 6828/6838  
[ABrC\\_customerservice@usm.my](mailto:ABrC_customerservice@usm.my)



## ANIMAL RESEARCH AND SERVICE CENTRE (ARASC)

Animal facilities offer competency training, sales of laboratory animals, research rooms, care services and implementation of procedures for the purpose of research/ testing on laboratory animals.

<b>Non-Accredited Facilities</b>	
HEALTH CAMPUS	
1.	Animal Biosafety Level 3 Laboratory (ABSL-3)
2.	BSL-2 Laboratory
3.	Aquatic Research Room
4.	Arthropod Research Room
5.	Sheep Holding Facility
6.	Cleaning, Sanitation, and Sterilization Room
HEALTH AND MAIN CAMPUSES	
1.	Animal Holding Room
2.	Animal Procedure Room
3.	Animal Quarantine Room
4.	Animal Operating Theatre
5.	Necropsy Room
6.	Teaching and Training Room
<b>Non-Accredited Services</b>	
1.	Laboratory animal supply (mice, rats, rabbits) (Health Campus)
2.	Animal care services
3.	Animal research procedure services
4.	Laboratory animal euthanasia services
5.	Biological waste disposal services

6.	Laboratory animal handling/procedure competency
7.	Laboratory animal transport services (Main Campus)

<b>List of Instrument</b>	
1.	Anaesthesia machine
2.	Autoclave
3.	Biosafety cabinet
4.	Transport Van
5.	Bedding disposal
6.	Microscope
7.	Centrifuge
8.	Microtome
9.	CO <sub>2</sub> incubator
10.	Oven
11.	Complete cages for rabbits
12.	Complete cages for rodents
13.	Primate cages
14.	Downdraft necropsy table
15.	Animal Transport van

For further information, please contact:

Dr. Nur Izni Mohd Zaharri (Health Campus)  
 Senior Veterinary Officer  
 ARASC Health Campus, 16150 Kubang Kerian, Kelantan  
 +(6)09-7671224  
[nurizni@usm.my](mailto:nurizni@usm.my)

Koh Chun Haw (Health Campus)  
 Senior Medical Laboratory Technologist  
 ARASC Health Campus  
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Adilah Abdul Khalil (Main Campus)  
 Senior Assistant Veterinary Officer  
 ARASC Main Campus  
 USM, 11800 Penang  
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## CENTRE FOR CHEMICAL BIOLOGY (CCB)

### a. Cell Culture Facilities Service

Cell culture denotes laboratory methods that allow the growth of eukaryotic or prokaryotic cells in favourable artificial conditions. The experimental applications of cultured cells are as diverse as the cell types that can be grown in vitro. In a clinical setting, however, cell culture is usually related to creating model systems that study basic cell biology, disease mechanisms, and the toxicity of novel drug compounds. One of the advantages of using cell culture for these applications is the feasibility to manipulate genes and molecular pathways. Thus, CCB offers our facilities for hands-on experimental for cell culture. Such services can offer researchers or scientists the advantages of having various choices in cell culture procedures, including cell-type-specific culturing, cell expansion, cryopreservation, and cell banking.

#### Non-Accredited Services

1. Cell Culture Facilities Service

#### List of Instrument

1. Biosafety Cabinet
2. Microscope
3. Water bath
4. CO<sub>2</sub> Incubator
5. Incubator

For further information, please contact:

Noorizan binti Miswan  
 Research Officer  
 Cell Culture Facilities Service  
 +(6)04-6535502 / 5583  
[noorizan\\_miswan@usm.my](mailto:noorizan_miswan@usm.my)



## b. Insect Identification

The insects are traditionally identified based on the morphological analysis. This method, however, has limitations due to the need for trained insect taxonomists within each insect group and at many instances the unknown insect specimen to be identified is morphologically incomplete for reliable identification. Hence, DNA bar-coding has become the method of choice for a rapid, reliable, and cost-effective identification of insect specimens. CCB is one of the leading experts in providing DNA barcoding and identification service of insect specimens, including urban pests to forest and aquatic insects based on advanced molecular techniques.

Non-Accredited Services	
1.	Insect Identification Services

List of Instrument	
1.	Microscope
2.	PCR Machine
3.	Gel electrophoresis system
4.	Gel Doc
5.	Nanodrop

For further information, please contact:

Dr. Veera Singham a/l K. Ganesan  
Senior Lecturer  
CR3 Lab, Centre for Chemical Biology,  
Universiti Sains Malaysia, Sains@USM, Blok B No. 10,  
Persiaran Bukit Jambul, 11900 Bayan Lepas Pulau Pinang.  
+(6) 04-6535502/5534  
[veerasingham@usm.my](mailto:veerasingham@usm.my)

## c. Real-Time PCR

Real-Time PCR brings extra advantage to your research due to its ability to measure the amount of the product starting from the exponential phase compared to conventional gel-based Real-Time PCR which only measures product during the plateau phase. With this Real-Time PCR, the amplicon accumulating at every cycle can be monitored easily since the reaction is very specific and precise. Our Real-Time PCR also eliminates the needs to solely analyse the amplicon through gel electrophoresis, which is time consuming, poor precision, low specificity and non-automated.

Non-Accredited Services	
1.	Real-Time PCR

List of Instrument	
1.	Real-Time PCR Machine

For further information, please contact:

Noorizan Binti Miswan  
Research Officer  
Drug Design/Sequencing, Universiti Sains Malaysia,  
Sains@USM, Blok B No. 10, Persiaran Bukit Jambul  
11900 Bayan Lepas Pulau Pinang.  
+(6) 04-6535502 / 5583  
[noorizan\\_miswan@usm.my](mailto:noorizan_miswan@usm.my)

#### d. Protein X-ray Crystallography

X-ray crystallography is the primary means of solving a protein's structure. The process involves crystallization, crystal optimization, crystal diffraction, and structure determination. Since every protein crystallizes under different conditions, over hundreds of conditions may have to be screened during crystallization to identify the initial crystallization conditions, which will then need to be optimized. The Protein X-Ray Crystallography unit is fully equipped to carry out structural studies on proteins or protein complexes (with a ligand, DNA, RNA, other protein, etc.).

##### Non-Accredited Services

1. Protein X-ray Crystallography

##### List of Instrument

1. X-Ray Diffraction System

For further information, please contact:

Dr. Teh Aik Hong  
Senior Lecturer  
X-ray room, Centre for Chemical Biology,  
Universiti Sains Malaysia, Sains@USM, Blok B No. 10,  
Persiaran Bukit Jambul, 11900 Bayan Lepas Pulau Pinang.  
+(6) 04-6535502 / 5566  
[aikhong@usm.my](mailto:aikhong@usm.my)

#### e. Next Generation Sequencing

The advance of sequencing technology has revolutionized the discovery in biological sciences. Next-generation sequencing-based (NGS) technology allows the rapid output of high volume of data with high sensitivity and specificity. NGS sequencing can be used for a broad range of applications, including whole genome studies, metagenomics surveys on microbiomes in the environment, and transcriptome profiling.

##### Non-Accredited Services

1. Next Generation Sequencing

For further information, please contact:

Dr. Lau Nyok Sean  
Research Officer  
Centre For Chemical Biology,  
Universiti Sains Malaysia, Sains@USM, Blok B No. 10,  
Persiaran Bukit Jambul, 11900 Bayan Lepas Pulau Pinang  
+(6) 04-6535502 / 5509  
[nyoksean@usm.my](mailto:nyoksean@usm.my)

#### f. High-Throughput DNA Sequencing Service

The term DNA sequencing refers to the sequencing method used to determine the arrangement of nucleotide bases (adenine, guanine, cytosine, thymine) in the DNA.

##### Non-Accredited Services

1. High-Throughput DNA Sequencing Service

For further information, please contact:

Nor Azura binti Azami  
Research Officer  
Centre For Chemical Biology,  
Universiti Sains Malaysia, Sains@USM, Blok B No. 10,  
Persiaran Bukit Jambul, 11900 Bayan Lepas Pulau Pinang.  
+(6) 04-6535502 / 5583  
[norazuraazami@usm.my](mailto:norazuraazami@usm.my)

#### g. CCB-Microbial Biodiversity Library (CCB-MBL)

Since the isolation of the first strain in 2009, the microbial collection in CCB has grown. An initiative to characterise and catalogue the collection started in 2013, leading to the establishment of the CCB-Microbial Biodiversity Library (CCB-MBL). In February 2018, the catalogue was made available online on our website. Our collections are also indexed and made searchable by the Global Catalogue of Microorganisms (<http://gcm.wfcc.info/>).

In CCB-MBL, Isolates have been preserved in glycerol stocks and by freeze-drying. Isolates are obtained from various sources, with an emphasis on aquatic and coastal ecosystems. These isolates are usually part of research projects on secondary metabolite characterisation, genomics, and chemical biology.

##### Non-Accredited Services

1. CCB-Microbial Biodiversity Library (CCB-MBL)

##### List of Instrument

1. Freeze -80°C
2. PCR Machine
3. Colony Doc
4. Gel Doc
5. Nanodrop

For further information, please contact:

Nor Azura binti Azami  
Research Officer  
Centre For Chemical Biology,  
Universiti Sains Malaysia, Sains@USM, Blok B No. 10,  
Persiaran Bukit Jambul  
11900 Bayan Lepas Pulau Pinang.  
+(6) 04-6535502 / 5583  
[norazuraazami@usm.my](mailto:norazuraazami@usm.my)

#### h. Microbial Identification Service

16S ribosomal RNA sequences have been used extensively in the classification and identification of Bacteria and Archaea. The comparison of the 16S rRNA gene sequence of an isolate against sequences of type strains of all prokaryotic species provides an accurate and convenient way to classify and identify prokaryotes routinely. While filamentous fungi are identified using mainly morphological characteristics, yeasts are identified using biochemical characteristics, such as their ability to utilize carbon and nitrogen compounds. However, these methods are often problematic as different morpho/biotypes within a single species can be observed. At CCB, we offer the fungal identification service by focusing mainly on ITS or D1/D2 regions for up to species level.

Non-Accredited Services	
1.	Microbial Identification Service

List of Instrument	
1.	Colony Doc
2.	Nanodrop
3.	PCR Machine
4.	Electrophoresis set system Gel Doc

For further information, please contact:

Dr. Go Furusawa  
Senior Lecturer  
CR 1 Lab/ Genomic Lab/Microbial Lab,  
Centre for Chemical Biology,  
Universiti Sains Malaysia, Sains@USM, Blok B No. 10,  
Persiaran Bukit Jambul, 11900 Bayan Lepas Pulau Pinang  
+(6) 04-6535502 / 5536  
[furusawa@usm.my](mailto:furusawa@usm.my)

#### i. Microbial Identification Via Biolog System

Biolog advanced phenotypic technology provides valuable information on the properties of strains, in addition to species-level identification. Biolog carbon source utilization technology identifies environmental and pathogenic microorganisms by producing a characteristic pattern or metabolic fingerprint from discrete test reactions performed within a 96-well microplate (GEN III plate) using Omnilog Plus System.

Non-Accredited Services	
1.	Microbial Identification <i>via</i> Biolog Service

List of Instrument	
1.	Omnilog Plus System

For further information, please contact:

Dr. Go Furusawa  
Senior Lecturer  
CR 1 Lab/ Genomic Lab/Microbial Lab,  
Centre for Chemical Biology,  
Universiti Sains Malaysia, Sains@USM, Blok B No. 10,  
Persiaran Bukit Jambul, 11900 Bayan Lepas Pulau Pinang,  
+(6) 04-6535502 / 5536  
[furusawa@usm.my](mailto:furusawa@usm.my)



## CENTER FOR DRUG RESEARCH (CDR)

CDR offers a range of laboratory services in the field of analytical chemistry, pharmacology, and neurosciences. Targeted sample analysis utilizing liquid chromatography-tandem mass spectrometry (LC-MS/MS) is available. Well-established neurobehavioural laboratories provide avenues for testing the memory and learning function of the brain, and addictive liability of substances utilizing approaches such as drug self-administration. Tests can be conducted either in rodents or in zebrafish depending on suitability. CDR pioneered blood-brain barrier research in the country and has successfully developed models to measure brain permeation of compounds across the barrier.

Basic and specialized laboratory training including but not limited to cell culture techniques, and techniques in animal research including cannulation, surgery, etc can be offered.

Under the Ministry of Higher Education, CDR was designated as the Higher Institution Centre of Excellence (HICoE) in Behavioural Research in Addiction, and we have been conducting multi-disciplinary research on ketum involving lab-based and social sciences.

Non-Accredited Services	
1.	Sample extraction in natural product research
2.	Qualitative and quantitative analyses of samples utilizing instruments such as liquid chromatography-tandem mass spectrometry (LC-MS/MS), gas chromatography-mass spectrometry (GC-MS), and high-performance liquid chromatography (HPLC)-UV/PDA
3.	Neurobehavioural tests in rodents and in zebrafish
4.	Synaptic plasticity analysis by measuring long-term potentiation
5.	Blood-brain barrier (BBB) permeability analysis
6.	Cytotoxicity analysis, and toxicity study in rodents
7.	Antioxidant assay
8.	Protein expression study using Western Blot analysis
9.	Gene expression study using qPCR analysis

<b>List of Instruments</b>	
1.	Sample Extraction
	■ Soxhlet apparatus
	● Rotary evaporator
	● Freeze dryer
	■ Micro-centrifuge
	■ Ultracentrifuge
2.	Quantitative and quantitative analyses of samples
	■ LC-MS/MS
	■ GC-MS
	■ HPLC-UV/PDA
	■ Fourier-transform infrared spectroscopy (FTIR)
	■ UV-Vis/microplate reader
	■ Liquid scintillation counter for quantitation of low energy radioisotopes
	■ Dissolution apparatus
3.	Neuro-behavioural and animal equipment
	■ Drug self-administration – rats and mice
	■ Place-preference test system – rats and mice
	■ Automated open field
	■ Passive/active avoidance test apparatus
	■ Novel object recognition apparatus
	■ Morris water maze
	■ Elevated plus maze
	■ SMART behaviour tracking system
	■ Microdialysis apparatus
	■ Tail flick test apparatus
	■ Hot plate test apparatus
	■ Forced swim test apparatus
	■ Zebrafish facility
	■ Motorized stereotaxic micromanipulator
	■ Long term potentiation apparatus
	■ Microsurgery microscope
	■ Light microscope/image analyser
	■ Clause 8.4 (Penetration)
	■ Telemetric EEG
4.	Cell culture facility
	■ Autoclave
	■ Biosafety cabinet class II
	■ CO <sub>2</sub> incubator
	■ Plate shaker incubator
	■ Inverted microscope
	■ Refrigerated centrifuge
	■ Chopstick electrode (STX-2) and voltohmmeter (EVOM2)
	■ Liquid nitrogen tanks
	■ Fridge (4°C) and freezers (-20°C, -80°C)



5. Western Blot apparatus
6. qPCR apparatus

For further information, please contact:

Pn. Nur Sabrina Mohd Yusof  
Science Officer,  
Centre for Drug Research (CDR),  
Universiti Sains Malaysia,  
11800 Minden, Penang, Malaysia.  
+(6)04-653 5224  
[nur\\_sabrina@usm.my](mailto:nur_sabrina@usm.my)



## CENTRE FOR GLOBAL ARCHAEOLOGICAL RESEARCH (CGAR)

### a. Earth Material Characterisation Lab

The Earth Material Characterization Laboratory (EMCL) also known as *Makmal Pencirian Bahan Bumi* was established in 2012 to conduct scientific study in archaeology and was turned into a commercial laboratory analysis to offer services to the public such as USM's staffs and students, government, corporate and private agencies. The laboratory began with three main instruments; Scanning Electron Microscope (SEM), X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF) and was expanded later to include other instruments such as Inductive Coupled Plasma-Mass Spec (ICP-MS), Optical Stimulated Luminescence (OSL) and 3D-Xray to support the research and services needs of USM and outside clients.

#### Accredited Services

1. Energy Dispersive X-Ray analysis
2. X-Ray Diffraction analysis

#### Non-Accredited Services

1. X-Ray Fluorescence (XRF)/Micro-XRF/Handheld XRF
2. Inductive Couple Plasma Mass Spec (ICPMS) + High Performance Liquid Chromatography
3. Digital Microscope
4. Archaeobotany analysis
5. 3D-Xray Analysis
6. 3D Desktop Scanner
7. Thermal Analyzer
8. FTIR analysis
9. Preparation of Rock Thin section
10. Fe-SEM (Scanning Electron Microscope)
11. OSL (Optical Stimulated Luminescence)

12. Terrestrial Mapping
13. Magnetometer
14. GPR (Ground Penetrating Radar)
15. Virtual Gallery
16. Archeotourisme consultation

<b>List of Instrument</b>
1. Scanning Electron Microscope (Fe-SEM)
2. X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF)
3. Inductive Coupled Plasma-Mass Spec (ICP-MS)
4. Optical Stimulated Luminescence (OSL)
5. 3D-Xray

For further information, please contact:

Abdul Mutalib Abdullah  
 Laboratory Manager  
 Makmal Pencirian Bahan Bumi,  
 Pusat Penyelidikan Arkeologi Global  
 Universiti Sains Malaysia  
 11800 USM P. Pinang  
 +(6) 011-55547794  
[mpbb@usm.my](mailto:mpbb@usm.my)



## CENTRAL RESEARCH LABORATORY (CRL), SCHOOL OF MEDICAL SCIENCES

Central Research Laboratory (CRL) is the research lab that include 4 Sections: General Service, Analytical Biochemistry, Histopathology and Molecular Biology. In 2017, CRL extends its service with the Cell Culture (cell lines) section. Services and facilities within these sections attract users among the lecturers, postgraduate and undergraduate students, science officers, research officers, research assistants, medical laboratory technologies, etc. CRL is manned by experienced Science and Research Officers, and Medical Laboratory Technologies who are committed to guide and assist you to perform research works in conducive laboratory setting.

### Accredited Services

1. Research Lab

### Non-Accredited Services

1. Analytical of biochemistry
2. Analytical of molecular and cellular
3. Cell Culture
4. Histopathology

### List of Instrument

1. Microplate reader
2. Spectral scanning multimode reader (Thermo Scientific)
3. Fluorescent microscope with image analyser (Olympus BX-41)
4. Spectrophotometer (Shimadzu)
5. Embedding center
6. Microtome (Leica)
7. Tissue processor (Leica)
8. Bio photometer (Eppendorf)

9.	Densitometer (BioRad)
10.	Electrophoresis set (DNA & protein)
11.	Gel dryer
12.	Gel documentation system (FluorChem, ProteinSimple)
13.	BSC Type II (Esco)
14.	Real Time PCR (Stratagene MX3000P)
15.	Thermal cycler (Eppendorf, ABI)
16.	Transblot semi dry (BioRad)
17.	UV transilluminator

For further information, please contact:

Arifin B Harun

Science Officer

Makmal Penyelidikan Pusat, Pusat Pengajian Sains Perubatan,

Kampus Kesihatan USM, 161500 Kubang kerian Kelantan

+(6) 09-7676878

[arifin@usm.my](mailto:arifin@usm.my)





## GRADUATE SCHOOL OF BUSINESS (GSB)

### a. Neuromarketing Mini Lab

Neuromarketing mini lab is located at Kabin B, Room 9. Currently, the lab is used for research development and teaching in related field of neuromarketing. There are two units of neuroscience tool in neuromarketing mini lab:

1. Neurosoft 10 channel Neuron-Spectrum 1/P EEG System.
2. Pupil Core Eye Tracking.

The neuro-marketing lab responsibilities:

1. To observe how people's brains respond to a specific advertisement, packaging design, product design, choosing colours, product placement etc.
2. Teaching/Demonstrating in related neuromarketing.
3. Research and development in related field of neuromarketing at the intersection of commerce and science.

#### Non-Accredited Services

1. Teaching and training using neuroscience tools for science and non-science background
2. Collaborative academic and industry research
3. Market analysis and product development

#### List of Instruments

1. Soundproof room, Neuron-Spectrum 1/P BFB, EEG Recorder, NET Software, EEG cap, EEG Electrode, Monitor, Laptop

For further information, please contact:

Associate Professor Dr. Salmi Mohd Isa

(+6) 012-3307969

[salmi.mohd.isa@usm.my](mailto:salmi.mohd.isa@usm.my)





## HOSPITAL USM

### a. Haematology & Coagulation

Haematology & Coagulation Laboratory Services

Accredited Services	
1.	Routine Haematology
2.	Routine Coagulation
3.	Special Haematology
4.	Special Coagulation
5.	Bone Marrow Aspiration
6.	Haemoglobin Analysis
7.	Flowcytometry
8.	Molecular

Non-Accredited Services	
1.	Bleeding Time
2.	Ferritin
3.	Thrombin Time
4.	Reptilase Time
5.	Mixing Test
6.	Factor Inhibitor Assay
7.	Thrombophilia Screening
8.	von Willebrand Factor Assay
9.	Platelet Aggregation Test
10.	Anti Xa assay

11. Factor II, V, VII, X, XI, XII assay
12. Factor XIII screening
13. Osmotic Fragility Test
14. Hb Inclusion
15. Hb Sickle

List of Instrument
1. Haematology Analyser
2. Coagulation Analyser
3. ESR Analyser
4. Capillary Electrophoresis
5. HPLC
6. Flowcytometry
7. PCR
8. RT-PCR

For further information, please contact:

Associate Professor Dr. Rosnah Bahar  
 Head of Department/Medical Lecturer  
 Makmal Hematologi, Hospital USM.  
 +(6) 09-7674020  
[hemato.upt@gmail.com](mailto:hemato.upt@gmail.com)

#### b. Morphine & Cannabis Test

Confirmation of drugs in urine sample

Accredited Services
1. Morphine & Cannabis Test

Non-Accredited Services
1. Amphetamines
2. Benzodiazepine
3. Barbiturates
4. PCP
5. Paraquat
6. Organophosphate
7. Mitragynine

List of Instrument
1. Drug analyzer Viva E Siemens

For further information, please contact:

Norzihana Ramli  
 Technical Manager  
 Pharmacology Laboratory Hospital USM  
 +(6) 09-7673991  
[norzihana@usm.my](mailto:norzihana@usm.my)

**c. IVF Laboratory, Hospital USM Fertility Unit**

Hospital USM Fertility Unit was established in 2014. It provides various advanced Assisted Reproductive Techniques which include In vitro fertilization (IVF), Intracytoplasmic sperm injection (ICSI), Percutaneous epididymal sperm extraction (PESA), Testicular sperm extraction (TESE) and Intrauterine insemination (IUI). We also provide basic fertility investigations and counselling. The first IVF baby of HUSMFU was born in August 2015. Since then, many more couples were blessed with children, and the number is increasing.

<b>Accredited Services</b>	
1.	In vitro fertilization (IVF)
2.	Intracytoplasmic Sperm Injection (ICSI)
3.	Seminal Fluid Analysis
4.	Percutaneous Epididymal Sperm Extraction
5.	Testicular Sperm Extraction
6.	Intrauterine Insemination

<b>Non-Accredited Services</b>	
1.	Pre-implantation Genetic Diagnosis (PGD)
2.	Sperm donation
3.	Sperm banking
4.	Oocyte donation
5.	Oocyte banking
6.	Surrogacy

For further information, please contact:

Assoc. Prof. Dr. Adibah Ibrahim  
Head of Obstetrics and Gynaecology Department/ Consultant  
Hospital USM Fertility Unit  
Hospital Universiti Sains Malaysia, Kampus Kesihatan  
16150 Kubang Kerian, Kelantan  
+(6) 09-7676341



## HUMAN GENOME CENTRE, SCHOOL OF MEDICAL SCIENCES

### a. Cytogenetic, Molecular cytogenetic and molecular genetic

The Human Genome Centre is the only centre on the East Coast of Peninsular Malaysia that offers genetic tests, especially in cytogenetics testing, and the only centre in Malaysia that offers a chromosomal breakage test for Fanconi Anaemia.

#### Accredited Services

1. Cytogenetic (peripheral blood and bone marrow)
2. Florescent in Situ Hybridization (FISH)
3. Molecular genetic for SRY gene

#### Non-Accredited Services

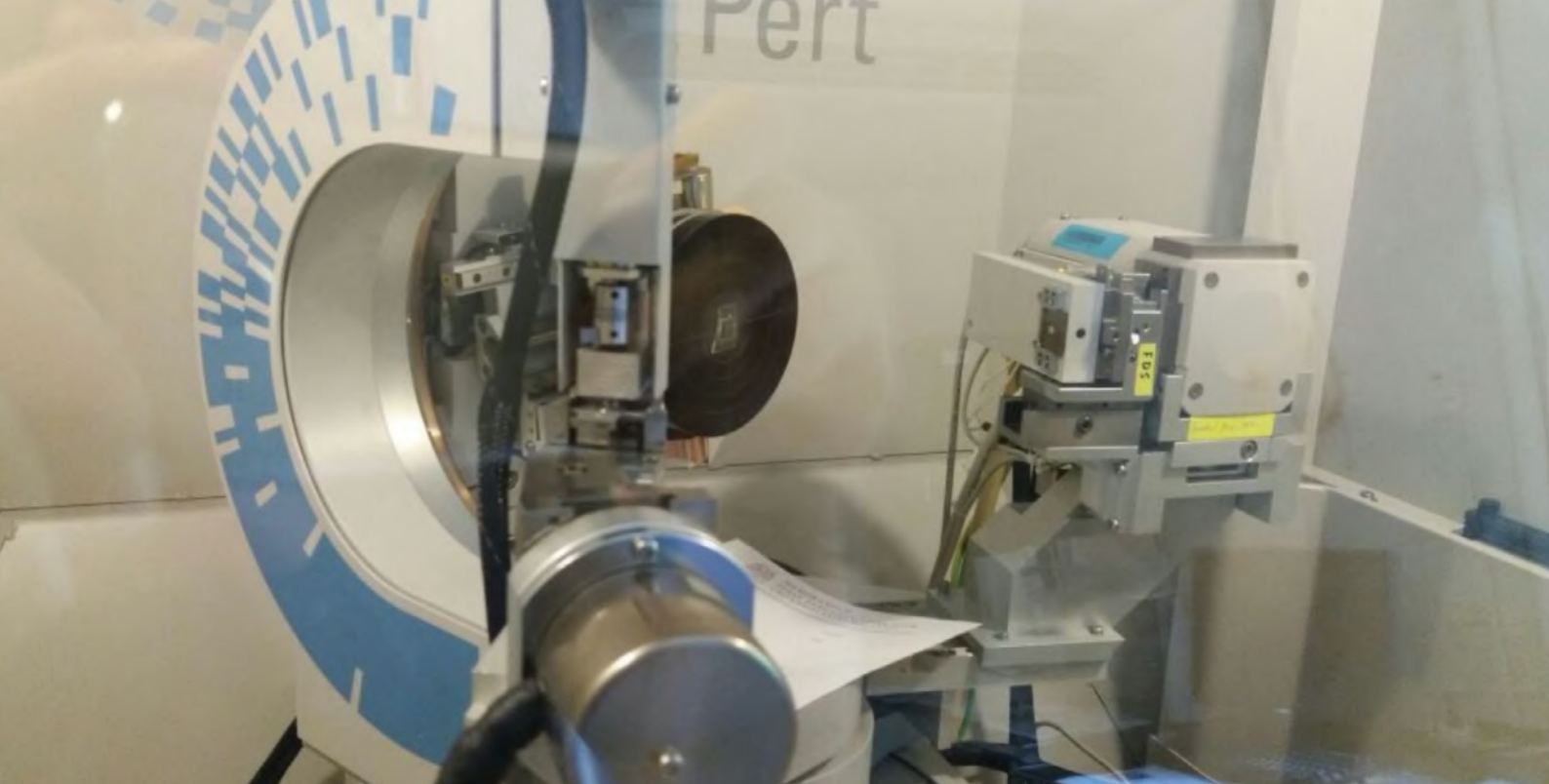
1. Cytogenetic analysis for chromosomal breakage of Fanconi Anaemia
2. FISH for FFPE sample (HER 2 for breast cancer)
3. Molecular analysis for Spinal Muscular Atrophy
4. Duchenne Muscular Atrophy
5. Gilbert syndrome
6. Prader Willi
7. Androgen Receptor Basic mutation
8. Y-microdeletion basic and extension analysis
9. BCR-ABL mutation Analysis

#### List of Instrument

1. Karyotyper
2. CO<sub>2</sub> incubator
3. PCR machine

For further information, please contact:

Dr. Nazihah Mohd Yunus  
Human Genome Centre, School of Medical Sciences,  
Health Campus of Universiti Sains Malaysia,  
16150 Kubang Kerian Kelantan  
+(6) 09-7676789  
[pgm@usm.my](mailto:pgm@usm.my)



## INSTITUTE OF NANO OPTOELECTRONICS RESEARCH AND TECHNOLOGY (INOR)

As a Centre of Excellence in Research, INOR offers research, services, and academic programs in the field of Optoelectronics and Nanotechnology. Services offered include processing, characterization, analysis, wafer products, training, and consultation related to optical and electronic materials and devices. The facilities available in INOR are considered as state of the art for nano and advanced materials technology for optoelectronics and electronics applications especially in light emitting diode (LED) / laser, sensor, solar cell and power device research and development.

### Non-Accredited Services

1. Thin film deposition
2. Sample characterizations
3. Chip fabrication with yellow room facility
4. III-nitrides wafer products
5. Professional Development Program (PDC)

### List of Instrument

1. Metal Organic Chemical Vapor Depositor (MOCVD)
2. Inductive Couple Plasma Etching System (ICP)
3. Maskless Lithography
4. E-Beam Evaporator
5. High Resolution X-Ray Diffraction (XRD)
6. Mini Photoluminescence (PL)
7. Optical Microscope
8. Glove Box
9. Spin Coater
10. Degas Vacuum System

11. Laminar Flow
12. Microwave Chamber
13. Dip Coater System
14. Probe Station with Stable Micropositioner
15. LED Quick Test Station
16. Electroluminescence (EL)

For further information, please contact:

Dr. Mundzir Abdullah  
Universiti Sains Malaysia (USM)  
SAINS@USM, Block A, Ground Floor  
No.10, Persiaran Bukit Jambul  
11900 Bayan Lepas, Penang, Malaysia  
+(6) 04-653 5637  
[mundzir@usm.my](mailto:mundzir@usm.my)





## NATIONAL POISON CENTRE (NPC)

### a. Toxicology Laboratory of National Poison Centre (PRNLab)

The laboratory provides services focusing on quality control of finished products such as traditional herbs, food and food supplements as well as cosmetics. We offer analytical tests to investigate and further identify the presence of adulterants (such as drugs) or contaminants (such as heavy metals) as required by the Poison Act 1952 or Food Act 1983 and its regulations.

#### Accredited Services

1. Sibutramine Screening
2. Erectile Dysfunction Screening

#### Non-Accredited Services

1. Whitening Agents Screening
2. Corticosteroids Screening
3. Drugs Screening
4. Unknown Drugs Screening
5. Antidiabetic agents Screening
6. Cholesterol lowering Drugs Screening
7. Pesticides Screening
8. Unknown Pesticides Screening
9. Chemical Profiling by GCMS / GCMS Analysis
10. Poisons Screening
11. Nicotine Screening
12. Nicotine / Cotinine quantitation (GC-MS)
13. Measurement of Heavy Metals
14. Measurement of Mercury (FIMS)
15. Hormone's screening
16. Laboratory Attachment



<b>List of Instrument</b>	
1.	High Performance Liquid Chromatography (HPLC)
2.	Gas Chromatography Mass Spectrometry (GCMS)
3.	Graphite Furnace Atomic Absorption Spectrometry (AAS)
4.	Flow Injection Mercury System (FIMS)
5.	Gas Chromatography Tandem Mass Spectrometry (GC ITQ MS/MS)

For further information, please contact:

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Laboratory Manager  
Toxicology Laboratory (PRNLab)  
National Poison Centre, Universiti Sains Malaysia,  
11800 Minden, Pulau Pinang  
Phone: +(6) 04-6532171/011-20863130  
Email: [prnlab@usm.my](mailto:prnlab@usm.my)  
Website: <https://prn.usm.my>  
FB: [www.facebook.com/toxicologylab](https://www.facebook.com/toxicologylab)



## RIVER ENGINEERING AND URBAN DRAINAGE RESEARCH CENTRE (REDAC)

### a. Makmal Hidraulik, Makmal Persekitaran 3

#### Non-Accredited Services

1. Water quality test
2. Hydraulic test
3. Sieve test

#### List of Instrument

1. Spectrophotometer, probe multiparameter, oven, BOD incubator, Heat reactor, Autoclave

For further information, please contact:

Associate Professor Dr. Foo Keng Yuen and Dr. Puay How Tion  
Makmal Hidraulik REDAC, Ruang Penyelidikan Bersepadu (RPS),  
Kampus Kejuruteraan, Universiti Sains Malaysia (USM),  
14300, Pulau Pinang  
+(6) 04-5995461  
[redac01@usm.my](mailto:redac01@usm.my)

Mohd Fazly Yusof and Syafiq Bin Shahrudin  
Makmal Persekitaran 3 REDAC,  
Kampus Kejuruteraan, Universiti Sains Malaysia (USM),  
14300, Pulau Pinang.  
+(6) 04-5995461  
[redac01@usm.my](mailto:redac01@usm.my)



# DESIGN AND FABRICATION SERVICES

# ANALYTICAL TESTING SERVICES

School of Chemical Engineering



## SCHOOL OF CHEMICAL ENGINEERING

The School of Chemical Engineering was established in May 1992, in the Engineering Campus, Nibong Tebal. The School is equipped with modern laboratories with state-of-the-art equipment that is used for students training, research and technical services.

School of Chemical Engineering offers a comprehensive scientific and technical laboratory testing services to government agencies and private companies. The Analytical Laboratory is equipped with many modern and sophisticated analytical equipment for a wide range of analyses that cater for industrial needs.

### Instrumentation Methods

The instrumentation methods of chemical analysis are divided into various categories according to the property of the samples. Many of the methods can be used for both qualitative and quantitative analyses. The categories of instrumentation methods are as follows:

List of Instrument	
1.	Spectroscopy
	■ Atomic Absorption Spectrometer (AAS)
	■ UV-Vis Spectrophotometer
	■ Fourier Transform Infrared spectroscopy (FTIR)
2.	Mass Spectrometry
	■ Gas Chromatography Mass Spectrometry (GCMS)
3.	Thermal Analysis
	■ Bomb Calorimeter
	■ Bomb Calorimeter
	■ Thermogravimetry Analysis (TGA)
	■ Thermal Conductivity (DFX)
	■ Differential Scanning Calorimeter (DSC)
	■ TPD/TPO/TPR Analysis

4.	Separation
	■ Gel Permeation Chromatography (GPC)
	■ Gas Chromatography (GC-FID) Analysis
	■ Gas Chromatography (GC-TCD) Analysis
	■ High-Performance Liquid Chromatography (HPLC)
	■ High-Performance Liquid Chromatography with Fluorescence Detector (HPLC-FLD)
	■ High-Performance Liquid Chromatography Sugar Analysis (HPLC-Sugar)
5.	Microscopy Analysis
	■ Scanning Electron Microscopy (SEM) with EDX
	■ Dark field microscopy
	■ Atomic Force Microscopy (AFM)
6.	Particle Analysis
	■ Surface Analyzer
	■ Coulter Porometer
	■ Zeta Potential
	■ Particle Size Analyzer
7.	Electrochemical Analysis
	■ Quartz Crystal Microbalance
8.	Elemental Analysis
	■ CHNS Elemental Analyzer
9.	Polarimetry Analysis
	■ Automatic Polarimeter
10.	Wet Chemical Analysis
	■ Viscometer
	■ Density
11.	Other Analysis
	■ Total Organic Carbon Analysis (TOC)
	■ Titrino Plus Water Content
	■ Freeze Dryer
	■ Rotary Evaporator
	■ Refractometer

School of Chemical Engineering provides fabrication services for industry and research requirements, government agencies and private sectors.

- Equipment Design
- Fabrication
- Installation, testing and commissioning
- Equipment services
- Training services

<b>Non-Accredited Services</b>	
1.	Equipment Design
	<ul style="list-style-type: none"> <li>■ Our design and fabrication workshop is equipped with state-of-the-art machine and fabricating facilities. To begin the design process, we require a few hand drawn sketches and technical specifications with project description. Further discussion may be needed to obtain all the necessary information regarding the project.</li> </ul>
2.	Fabrication
	<ul style="list-style-type: none"> <li>■ Fabrication and assembly of custom designed systems made up of stainless steel, mild steel, nylon, teflon, derlin and acrylic materials.</li> <li>■ Example of products that can be fabricated: Permeation test rig; Hollow fibre membrane test rig; Acrylic dead end membrane filtration; Membrane filtration system; Pressure reactor; Stainless steel culture rack</li> </ul>
3.	Installation, testing and commissioning
	<ul style="list-style-type: none"> <li>■ In research work, the correct installation of equipment or device is vital for achieving specific functional performance, safety and efficiency in producing accurate results. We provide services that cover everything from installation, testing and commissioning of custom-design systems.</li> </ul>
4.	Equipment services
	<ul style="list-style-type: none"> <li>■ Spare part purchasing</li> <li>■ Modification and duplication of parts</li> </ul>
5.	Other services
	<ul style="list-style-type: none"> <li>■ Hands-on training</li> <li>■ Inspection and troubleshooting</li> </ul>

<b>Non-Accredited Facilities</b>	
1.	School of Chemical Engineering's workshop has a variety of equipment/machinery to produce quality products for customers.
	<ul style="list-style-type: none"> <li>■ Lathe/turning machine</li> <li>■ Milling machine</li> <li>■ TIG and MIG machine</li> <li>■ Grinding machine</li> <li>■ Portable drill</li> <li>■ Complete tools</li> </ul>





## SCHOOL OF DENTAL SCIENCES

### a. Dental Technology Laboratory

Dental Laboratory Technology is one of the main laboratories that is located in School of Dental Sciences, USM which is situated in first floor. Currently the laboratory is supervised by 25 trained Dental Technologies where all dental prosthesis is made by its own discipline such as prosthodontics, removal appliances, maxillofacial and implant cases.

There are 5 main units of Dental Lab specifically:

1. Prosthodontic Unit
2. Cobalt-Chrome Unit
3. Maxillo Facial Unit
4. Orthodontic Unit
5. Ceramic Unit

The Dental Technology Laboratory also hold 3 responsibilities consist of:

1. Produce dental prostheses and its appliances.
2. Teaching/Demonstrating in related dental technology.
3. Research and development in related field of dental technology.

#### Accredited Services

1. Manufacture of dental prothesis
2. Teaching, course & research

#### List of Instrument

1. Workstation, plaster room equipment, casting equipment, porcelain equipment etc

For further information, please contact:

Abdul Rahman Mustaffa  
 Juruteknologi Pergigian  
 Makmal Teknologi Pergigian,  
 Pusat Pengajian Sains Pergigian (PPSG)  
 +(6) 09-7675673 / 5671  
[abdrahman@usm.my](mailto:abdrahman@usm.my)

Che Suhailah A Rahman  
 Science Officer  
 Craniofacial Science & Biomaterial Laboratory,  
 School of Dental Sciences, USM Health Campus  
 +(6) 09-7675754  
[suhailah@usm.my](mailto:suhailah@usm.my)  
 Website: [www.dental.usm.my](http://www.dental.usm.my)

**b. MTT Assay**

Cytotoxicity test of compound / drug / biomaterial on normal or cancer cells using MTT assay.

For further information, please contact:

Nor Shamsuria Omar  
Science Officer  
[shamsuria@usm.my](mailto:shamsuria@usm.my)  
+(6) 09-7675560

**c. Antimicrobial Testing for Oral Pathogens**

Microbiology Unit, Craniofacial Science Laboratory provides services and facilities to support research activities in the field of Microbiology and Genotoxicity.

Non-Accredited Services	
1.	Determination of Minimum Inhibitory Concentration (MIC)
2.	Minimum Bactericidal Concentration(MBC)
3.	Minimum Fungicidal Concentration (MFC)
4.	Disk/Well Diffusion Test
5.	Total Plate Count for aerobic and anaerobic organisms

For further information, please contact:

Haswati @ Nurhayati Abdullah  
Science Officer  
[haswati@usm.my](mailto:haswati@usm.my)  
+(6) 09-7675752

**d. Fourier Transform InfraRed Spectroscopy (FT-IR)**

Technique for quality control when evaluating industrially manufactured material and can often serve as the first step in the material analysis process. FTIR analysis services can identify compounds and the general type of material being analyzed when there are unknowns. This technique is used to assess the purity of some inorganic samples and is highly reliable for identifying polymer composition. Our FTIR testing lab can analyze solid, liquid, powder or thin film samples.

Non-Accredited Services	
1.	Solids placed on a crystal (ATR)
2.	Powdered sample mixed with potassium bromide and placed in a pellet (KBr pellet)

For further information, please contact:

Noor Baizura Ab Ghani  
Science Officer  
[baizurakck@usm.my](mailto:baizurakck@usm.my)  
+(6) 09-7675826

**e. Mechanical Testing**

Our universal testing machine can help you to ensure that your products are fit for your intended purpose, compile the information you need to put your design into practice and comply with the relevant regulations and quality standard.

<b>Non-Accredited Services</b>	
1.	Bond strength
2.	Flexural strength
3.	Compressive strength
4.	Tensile strength
5.	Fracture toughness

For further information, please contact:

Che Suhailah A Rahman  
Science Officer  
[suhailah@usm.my](mailto:suhailah@usm.my)  
+(6) 09-7675754

**f. Hirox Digital Microscope**

The Hirox KH7700 is a system with a digital microscope.

<b>Non-Accredited Services</b>	
1.	2D & 3D Measurements
2.	3D Image Rendering
3.	3D Profile
4.	Height Measurement
5.	Volume Measurement
6.	Image Comparison

For further information, please contact:

Nur Mohamad Bin Mohd Makhatar  
Science Officer  
[nurmohamad@usm.my](mailto:nurmohamad@usm.my)  
+(6) 09-7676623





## SCHOOL OF HEALTH SCIENCES

### a. Clinical Hearing Assessment

Diagnostic hearing assessment

#### Accredited Services

1. Hearing assessment

#### List of Instrument

1. Audiometer and tympanometer

For further information, please contact:

LECTURER AND AUDIOLOGIST  
Klinik Audiologi USM,  
Pusat Pengajian Sains Kesihatan  
161500 Kubang Kerian, Kelantan  
+(6) 09-7677692  
[fadzilnor@usm.my](mailto:fadzilnor@usm.my)

## b. Elemental Analysis Service

Atomic absorption spectrometry (AAS) is an easy, high-throughput, and inexpensive technology used primarily to analyze elements in solution. As such, AAS is used in food and beverage, water, clinical research, and pharmaceutical analysis. It is also used in mining operations to determine, for instance, the percentage of precious metal in ores.

ICPMS as AAS is used for elemental determinations. Geochemical analysis labs were early adopters of ICPMS technology because of its superior detection capabilities, particularly for Rare-Earth Elements (REEs). ICPMS has many advantages over other element analysis technique such as atomic absorption and optical emission spectrometry, ICP Atomic Emission Spectroscopy (ICP-AES). The advantages of ICPMS are:

- Better detection limits and higher throughput compared to Graphite Furnace Atomic Absorption Spectroscopy (GFAAS).
- Ability to handle both simple and complex matrices with minimum matrix interferences due to the high-temperature of the ICP source.
- Superior detection capability to ICP-AES with same sample throughput

Ability to obtain isotopic information

Accredited Services	
1.	Elemental analysis using AAS and ICPMS

Non-Accredited Services	
1.	Atomic Absorption Spectrometer Analysis dan ICPMS analysis

List of Instrument	
1.	Atomic Absorption Spectrometer (Perkin Elmer)
2.	Inductive Couple Plasma Mass Spectrometer (Agilent 7700x)

For further information, please contact:

Nor Azizah Abdullah / Rosliza bin Haron  
Quality Manager/Technical Manager  
Makmal Anlitikal Lanjutan, PPSK,  
USM Kampus Kesihatan 16150 Kubang Kerian, Kelantan  
+(6) 09-7677702  
[malppsk@usm.my](mailto:malppsk@usm.my)

## c. Fitness Test

A sports laboratory which conducts fitness testing in the areas of cardiovascular fitness (gas analyzer), strength (isokinetics), and biomechanical movement (3D motion analysis) for athletes and students.

List of Instrument	
1.	Gas analyser
2.	Camera 3D motion analysis.
3.	Wingate test

For further information, please contact:

Mohd Hafezi Mat Zain  
Youth and Sport Officer  
Makmal Sains Sukan  
+(6) 09-7677694  
[hafezi@usm.my](mailto:hafezi@usm.my)

#### d. HID/DNA UNIT

HID/DNA unit is an accredited laboratory under MS ISO/IEC 17025 (Department Standard Malaysia). It provides accredited DNA Paternity testing using a validated platform and conducted by competent personnel. We are committed in providing quality testing and apply the highest standards in our protocol to ensure accurate results. This unit also provides human cell line authenticity utilising ShortTandem Repeats (STR) profiling. It is a comprehensive service that includes everything from DNA extraction to profile comparison against the ATCC STRdatabase.

Accredited Services	
1.	DNA Profiling - Paternity Testing

Non-Accredited Services	
1.	Mitochondrial DNA Testing
2.	Human Cell Line Authentication Services

List of Instrument	
1.	3130xl GENETIC ANALYZER

For further information, please contact:

Puan Nur Azeelah Abdullah  
Research Officer  
HID/DNA Unit, School of Health Sciences,  
Health Campus, Universiti Sains Malaysia,  
16150 Kubang Kerian, Kelantan  
+(6) 09-767 7603 / 09-767 7829  
[hid\\_dna@usm.my](mailto:hid_dna@usm.my) / [azeelah@usm.my](mailto:azeelah@usm.my)

#### e. Scanning Electron Microscope Imaging

We provide biological sample processing and sample imaging from biological sample and material non biological.

List of Instrument	
1.	Scanning Electron Microscope Quanta FEG 450
2.	Sputter coater
3.	Critical Point Dryer

For further information, please contact:

Mohamad Noor bin Mohamad Roze  
Sciences Officer  
Scanning Electron Microscope Laboratory,  
School of Health Sciences,  
Health Campus, Universiti Sains Malaysia,  
16150 Kubang Kerian, Kelantan.  
+(6) 09-7677790  
[semppsk@kk.usm.my](mailto:semppsk@kk.usm.my)



## SCHOOL OF HOUSING, BUILDING AND PLANNING

### a. HBP TESTING UNIT (HBPTU)

The HBP Testing Unit (HBPTU) is under the School of Housing, Building and Planning, Universiti Sains Malaysia (USM), Penang, Malaysia. HBPTU is situated in the laboratory area on the Ground Floor of Room 006,007 and 008 Building E40. HBPTU was accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 by Standards Malaysia since November 2013.

This accreditation demonstrates technical competence for specific tests related to Concrete, Metallic Material and Hot Rolled Steel Bar and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communique dated January 2009).

The School of Housing, Building and Planning (HBP) established in 1972 by the late Tan Sri Professor Hamzah Sendut, the Vice Chancellor of USM, the nation's second oldest university, the School of Housing, Building and Planning is one of the few buildings construction-based educational centres in Malaysia that is multi-disciplinary in nature. The school was modelled along the lines of what Professor Koenigsberger and Markus had envisioned to meet the needs of a developing country.

Even though over the years it has evolved to cater to a more widely accepted precept that clearly demarcates professional boundaries, the inter-disciplinary tradition is still maintained in all its undergraduate courses and also postgraduate programmes in seven disciplinary namely Construction Management, Architecture, Interior Design, Building Technology, Urban & Regional Planning, Quantity Surveying and Building Surveying. HBP is an experienced and able to carry out various research and consultancy in the construction industry, steel and wood fabrication service, information technology skills, land survey (geomatics) and laboratory equipment calibration.

Aside from servicing the Housing, Building and Planning needs and the centre for student development in practical training. The centre offers engineering testing services for building materials and building site testing. The service is applied to all government agencies and private agencies associate with building infrastructure industries.

<b>Accredited Services</b>	
1.	Concrete Compression (up to 3000 kN)
	■ Cube
	■ Core
2.	Metallic Material Tensile Test (up to 2000 kN)
3.	Hot Rolled Steel Bar Tensile Test (up to 2000 kN)
4.	Soil Determination of In-situ Density
	■ (Field Density) of Soil
	■ (Sand Replacement Method)
5.	Determination of Dry Density
	■ Moisture Content Relationship (Proctor Compaction Test)
	■ 4.5 kg Rammer BS 1377: Part 4: 1990 (Clause 3.5 & 3.6)
6.	Soil
	■ 2.5 kg Rammer BS 1377: Part 4: 1990 (Clause 3.4)
7.	Determination of Moisture Content (Oven Drying)
8.	Determination of California Bearing Ratio (CBR)
	■ BS 1377: Part 4: 1990
	■ Clause 7.2.3.3 (Preparation of Sample)
	■ Clause 7.3 (Soaking)
	■ Clause 7.4 (Penetration)
	■ BS 1056: Part 4: 2005
	■ (Confirmed 2013)
	■ Clause 8.2.3.3 (Preparation of Sample)
	■ Clause 8.3 (Soaking)
	■ Clause 8.4 (Penetration)
9.	Determination of In-Situ California Bearing Ratio (CBR)
	■ BS 1377: Part 4: 1990 (Clause 4.3)

<b>Non-Accredited Services</b>	
1.	Testing of Steel
	■ Determination of Bend and Rebend Test of Hot Rolled Steel Bar - set of 2 specimens
	■ Determination of Tensile/Bend of Falt Bar Welded/Non-Welded Hot Rolled Steel Bar - per 2 specimens
	■ Determination of Tensile and Shear Test of Steel Fabric - per set of 4 specimen/test
2.	Testing of Concrete
	■ Determination of Flexural Strength of Concrete Prism - per unit (Size 100x100x500 & 150x150x750) (mm)
	■ Portable Ultrasonic Non-Destructive Indicating Tester (PUNDIT) - per location of 16 reading
	■ Rebound Schmidt Number - per location of 12 reading
	■ Mobilization
3.	Testing of Concrete Materials
	■ Particle Size Distribution (Coarse/Fine)
	■ Clay, Silt and Dust Content
	■ Aggregate Crushing Value
	■ Relative Density and Water Absorption



■ Flakiness Index
■ Angularity Number
■ Compressive Test of Rock Core
■ Determination of Abrasion Value (LA Abrasion Machine)
■ Soundness Test
4. Testing of Brick, Block & Cement
■ Testing of Bricks and Blocks - per set of 10 specimen
■ Test of Setting Time of Cement - per test
5. Testing Soil
a. Soil Classification Tests:
■ Determination of the liquid limit
■ Determination of the plastic limit
■ Determination of the plasticity index
■ Determination of the linear shrinkage
■ Determination of the specific gravity of soil particles
■ Determination of the particle size distribution

<b>List of Instrument</b>	
1.	Gotech Universal Testing Machine 50T
2.	Gotech Universal Testing Machine 2000kN
3.	Gotech 3000kN Compression Machine
4.	ELE 3000 kN Compression Machine
5.	Electronic Balance Shinko Denshi Capacity: 30 kg
6.	Electronic Balance Ohaus Capacity: 30 kg
7.	Electronic Balance Shinko Denshi Capacity: 15 kg
8.	Electronic Bench Scale Ohaus Capacity: 300 kg
9.	Digital Caliper (150 mm) Mitutoyo
10.	Digital Caliper (150 mm) Mitutoyo
11.	Digital Caliper (200 mm) Mitutoyo
12.	Thermohygrometer
13.	Thermohygrometer
14.	Laboratory Drying Oven NL 1017X/010
15.	Electric Balance 0.01g Vibra AJ-6200E
16.	Electric Balance 0.1g Vibra AJ-12KE
17.	Electric Balance 0.1g Vibra AJ-12KE
18.	TML Load Cell 500kN CLP-500KNB
19.	TML Displacement Transducer 50mm (LVDT) CDP-50
20.	TML Displacement Transducer 100mm (LVDT)CDP-100
21.	Kyowa Data Logger PCD-300B
22.	Generator
23.	Voltage Stabilizer Regulator
24.	ELE 45kN Mechanical Jack
25.	CBR Compression Machine 5 Ton WF-10040

26.	Ctaplus S-Beam Load Cell 1 tonf (10 kN) CSBA-1tf
27.	Ctaplus S-Beam Load Cell 5 tonf (50 kN) CSBA-5tf
28.	Ctaplus S-Beam Load Cell 2 kN, Model CSBA-200K
29.	Honeywell S-Beam Load Cell 2 kN, Model 151
30.	2.5 kg Compaction Rammer
31.	4.5 kg Compaction Rammer
32.	1 Pouring Cylinder Large (D 215±2.0 mm, 15 L)
33.	1 Pouring Cylinder Small (D 115±1.0 mm, 3 L)
34.	1 Large Calibration Container (D 200±5.0 mm X 250±3.0 mm)
35.	1 Small Calibration Container (D 100±2.0 mm X 150±3.0 mm)

For further information, please contact:

Prof. Madya Sr. Dr. Mohd Zailan Sulieman  
 General Manager  
 HBP Testing Unit  
 School of Housing, Building & Planning  
 Universiti Sains Malaysia  
 +(6) 019-4459911 / 04-6533280  
[khalid\\_ahmad@usm.my](mailto:khalid_ahmad@usm.my)





## SCHOOL OF HUMANITIES

### a. Makmal Kesusasteraan

This laboratory is provided for learning and teaching matters that involve courses related to the use of multimedia such as software, applications and others.

List of Instrument
1. Computers, Projector



For further information, please contact:

Dr. Rosnidar Ain  
Lecturer  
C24, School of Humanities  
+(6) 04-6532680  
[rosnidar\\_ain@usm.my](mailto:rosnidar_ain@usm.my)

### b. Language and Interpreting Skills Development

The Interpreting Lab is utilised to train simultaneous interpreting for roundtable discussions. It has 6 interpreting booths that links directly to participants seated at a roundtable. The Audio-visual Lab is equipped with computers that are linked to a hub that consists of various methods for either interpreter training, subtitling, as well as language learning.

List of Instrument
1. Interpreting equipment with headsets and microphones for Interpreting Lab
2. 30 student desktop computers and 1 teacher computer console with language software and hub for Audio-visual Lab



For further information, please contact:

Dr Leelany Ayob  
Senior Lecturer  
Audiovisual Lab and Interpreting Lab,  
C24, School of Humanities, USM  
+(6) 012-4099964  
[leelany@usm.my](mailto:leelany@usm.my)

**c. GIS Lab**

GIS Lab in C24, School Humanities is mainly used for GIS & RS hands on training for both undergraduates and postgraduates of USM. Workshops and trainings for both basic and advanced levels are conducted in this lab. Currently, with the limited availability of computer workstations, this lab has a capacity of 12 (max). Available software is QGIS (for GIS analysis) and Idrisi (Remote Sensing analysis).

<b>Non-Accredited Services</b>	
1.	Geographic Information System Analysis
2.	Remote Sensing Analysis
3.	GIS & RS Workshop
4.	GIS & RS Basic Training
5.	GIS & RS Advanced Training
6.	Industrial Training
7.	Internship

<b>List of Instrument</b>	
1.	Desktop computers, multimedia

For further information, please contact:

Dr. Wan Mohd. Muhiyuddin Wan Ibrahim (Senior lecturer) &

En. Syaiful Azim Abdul Wahab (Lab technician)

Makmal GIS, C24 Level 1, School of Humanities, USM

+(6) 011-5505 5345 (Dr. Wan Mohd. Muhiyuddin)

[wmmwi@usm.my](mailto:wmmwi@usm.my)



## SCHOOL OF MATERIALS AND MINERAL RESOURCES ENGINEERING

### a. Testing Service Facility in the School of Materials and Mineral Resources Engineering

Our service facilities cover the entire spectrum of industries such as semiconductors, advanced materials, biomedical, steel, composites, and oil-related businesses. We also support all kinds of new research related to materials, polymers, and minerals. With talented and experienced staff, we believe our service will give a better solution to our customers.

#### Accredited Services

1. Hardness Test (Rockwell C, ASTM E18-2017)
2. Tensile Test (Metal, ASTM E8/8M-16a, Instron)
3. Tensile Test (Plastic, ASTM D638-14, Instron)

#### Non-Accredited Services

1. Ageing Test (Polymeric Materials)
2. Aggregate Crushing Value (ACV) -- Aggregate Impact Value (AIV)
3. Auto titration/Zeta Potential
4. Analytical chemistry
5. Autoclave (max T 250° C)
6. Bending Test- Three Point Bend Test
7. Chemical Composition
8. Chemical Resistant
9. Compression Moulding
10. Compression Test
11. Colour Measurement
12. Corrosion

13. Concentration of Electron, Mobility of Electron
14. Creep Test
15. Cyclic Voltamogram
16. Conductivity at Different Temperature and Current/Voltage Characteristic
17. Contact Angle Measurement
18. Crushing Test work
19. Crushing Test work (Min. 2 tonne)
20. Density Test
21. Dynamic Mechanical Testing (DMA) Analysis
22. Elemental Analysis (EDX/AAS/ICP-OES)
23. Electrical Resistivity Test
24. Fatigue Test
25. Fine Grinding
26. Flotation Test
27. Functional Group and Bonding analysis (FTIR)
28. Furnaces (max T 1600OC)
29. Geophysics Survey
30. Geological Mapping
31. Gravity Concentrator
32. Hardenability Test
33. Hardness Test
34. Internal Mixer for Polymer
35. Impact Test
36. Impedance Spectroscopy
37. Magnetic Separator
38. Metallographic Sample Preparation
39. Microstructure/Morphology
40. Melt Flow Index (MFI)
41. Modulus Test
42. Molecular Weight Measurement
43. Oven (max T 200°C)
44. pH value
45. Phase Analysis (Not inclusive phase analysis)-XRD
46. Plastic Injection Moulding
47. Plastic Mixing
48. Plastic Mixing (Extrusion)
49. Powder Compaction
50. Polarized Microscope (Petrography/Petrology) Polished Section (with photomicrograph)
51. Rubber Injection Moulding
52. Shape Analysis (BS) Elongation Index
53. Shape Analysis (BS) Flakiness Index
54. Sound and Vibration Measuring for blasting

55. Solder Reliability Test
56. Standard Bond Grind Ability Test
57. Standard Polished Section Preparation (Ore Specimen)
58. Standard Thin Section Preparation (Ore & Rock Specimen)
59. Surface Analysis (AFM)
60. Surface Area (BET)
61. Surface Resistivity
62. Thermal analysis (TGA-DTA, DSC)
63. Thermal Conductivity Analysis
64. Thermal Expansion
65. Torsion Test
66. Viscosity Cone and Plate
67. Weathering Test
68. Zeta Potential

<b>List of Instruments</b>	
1. Oven (RT-400°C)	
2. Standard Crushing Tester	
3. Standard Impact Tester	
4. Zeta Sizer	
5. UV-Visible Spectrometer	
6. Thermal exposure	
7. Instron Machine	
8. X-ray fluorescence (XRF)	
9. Hot Press Machine	
10. Instron Machine	
11. Universal Testing Machine (UTM), 50 tonne	
12. Colorimeter	
13. Polarization Test	
14. Immersion test	
15. Potentiostat	
16. Parameter Analyser	
17. Goinometer	
18. Jaw Crusher/Double Swing Jaw Crusher/Cone Crusher	
19. Pycnometer Density/Archimedes	
20. Energy-dispersive X-ray (EDX)	
21. Atomic Absorption Spectrometry (AAS)	
22. ICP-OES	
23. High Resistant Meter	
24. Four Points Probe meter	
25. UTM Machine	
26. Planetary Mill	

27. Milling machine (roller machine)
28. Denver Flotation Test
29. Flow Cone
30. Vacuum sintering furnace
31. Chamber/tube furnace
32. Glass melting furnace
33. Drone
34. Spiral Shaking Table
35. Rockwell, Brinell (micro), Vickers (micro)
36. Internal Mixer
37. Impact Tester
38. Magnetic Separator/ Eddy Current Separator
39. Field Emission Scanning Electron Microscopy (FESEM)
40. Table-top Scanning Electron Microscopy (Table-SEM)
41. Optical microscopy
42. Melt Indexer
43. Sonic Modulus Tester
44. Gel Permeation Chromatography (GPC)
45. Ultrasonic
46. Liquid Penetrant
47. Heating/Drying
48. Zeta Sizer
49. Sieves
50. pH meter
51. X-ray diffraction (XRD) machine
52. Heated Two Roll Mill
53. Single Screw Extruder
54. Twin Screw Extruder
55. Cold Isostatic Press
56. Hot Isostatic Press
57. Microscope
58. Drop Weight Tester
59. Point Load Tester
60. Two Roll Mill
61. Elongation Gauge
62. Flakiness Gauge
63. Blastmate
64. Solder Checker
65. Sample Cutter and Polishing Machine
66. Atomic Force Microscope
67. Brunauer-Emmett-Teller (BET)
68. Resistivity Meter



69.	Thermal Gravimetric analysis (TGA)
70.	Differential Scanning Calorimetry (DSC)
71.	Universal Testing Machine
72.	Thermal Conductivity Meter
73.	Dilatometer
74.	Particle Size Analysis, Zeta Sizer

For further information, please contact:

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## SCHOOL OF MECHANICAL ENGINEERING

### a. Quality and Corporate Unit (QCU)

Quality and Corporate Unit (QCU), School of Mechanical Engineering, Universiti Sains Malaysia was established on 1st Jan 2019. The aim of this entity is to assist the school in enhancing the networking by servicing the community and industries with in-house expertise and facilities. In general, the available services are focused on tests, consultancy, innovative products, and short courses. Currently, the QCU is exploring opportunities in wider area such as Development of Product, Research To-Market Program, Innovative Products for Community Engagement, Industrial Engagement Project, Consultancy, Testing Services, Prototyping Services, Short Courses/Seminars/Workshops.

Non-Accredited Services	
1.	Testing and Analysis
	■ Hardness Test/Scratch Test (Nano indenter)
	■ TGA Analysis
	■ Heating Value Analysis (HHV)
	■ Wear Test
	■ Tensile/Compression Test
	■ Impact Test
	■ Strength Test
	■ Loading Test
	■ SEM Analysis
	■ Roughness Test ( Alicona 3D Optical Microscope)
	■ Analysis of Microstructure
	■ Hardness Test (Vickers)
	■ Torsional Test
	■ Wear Test (Pin on Disk)
	■ Four Ball Tester
	■ EDX test

■ Engine Performance Test
■ Vibration and Sound Test
■ Thermal & Heat Test
2. Fabrication
<i>Machining</i>
■ CNC
■ CNC Lathe Machine
■ CNC Milling Machine
■ CNC Wire Cut
■ 3D Scanner/Printer
■ Injection Molding
<i>Welding</i>
■ MIG
■ TIG
■ Gas Arka
■ Kuka Robot
3. Consultation & Product Development
<i>Related research group/area:</i>
■ Stress, Damage & Failure Mechanisms
■ Industrial and Operational Management
■ Metal Forming
■ The Vibration Lab
■ Nanofabrication & Functional Materials
■ Biomass Energy & Energy Efficient Systems
■ Industrial & Manufacturing Engineering
■ Advanced Packaging and Surface Mount Technology
■ Biomechanics
4. Rental (Space/ Equipment/ Facilities etc.)
■ Forklift
■ Lecture Room
■ Conference Room
■ Seminar Room
■ Computer Lab (CAD)
■ Interactive Room (For Teaching)
■ Drawing Hall (For Examination)
5. Training & Development
■ Any training related to Mechanical and Manufacturing Engineering fields (Applied Mechanics, Thermo-fluids, System & Manufacturing Technology, Measurement & Control, Design & Analysis)

For further information, please contact:

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[Website: mebusiness.eng.usm.my](http://mebusiness.eng.usm.my)  
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## SCHOOL OF MEDICAL SCIENCES

### a. Pathology Laboratory

HUSM Pathology Laboratory provides histology and cytology testing services. Histology laboratory is a branch of pathology related with the study of disease on tissue slices. Meanwhile, the cytopathology laboratory is a study in relation to cells.

#### Accredited of Services

1. Histology Examination (Routine HPE)
2. Frozen section examination
3. Renal Biopsy Examination
4. Enzyme Examination (ACH)
5. Special Stain
6. Immunohistochemistry
7. Non Gynae Cytology
8. Fine Needle Aspiration Cytology

#### Non-Accredited of Services

1. Muscle Biopsy
2. Seminal Fluid Analysis (SFA)
3. Gynae Cytopathology (Pap Smear)
4. High Vaginal Swab (HVS) For Spermatozoa Examination (Rape Case)

#### List of Instrument

1. Grossing Cabinet
2. Tissue Processor
3. Tissue embedding
4. Microtomer
5. Cold Plate

6.	Hot Plate
7.	Floatation Bath
8.	H&E Autostainer
9.	IHC Autostainer
10.	Cryostat
11.	Microscope
12.	Oven
13.	Biosafety Cabinet Class II
14.	Liquid Base Cytology Processor
15.	Cyto Spin
16.	Fume Hood

For further information, please contact:

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 Makmal Patologi, Kampus Kesihatan  
 Kubang Kerian Kelantan  
 +(6) 09-7676453  
[pathology@usm.my](mailto:pathology@usm.my)

#### b. Tissue Bank

Tissue Bank engages services involving tissue from living or cadaveric individuals and bovine tissues for transplantation purposes. These services include assessing donor suitability, tissue recovery, tissue processing, storage, labelling and distribution. It is also responsible for testing and sterilisation of the tissues.

Accredited Services	
1.	Procurement, Processing, Storage and Distribution of Allograft Tissue (Bone, Tendon, Fascia, Skin and Amniotic Membrane) And Xenograft (Bovine Pericardium and Bovine Bone)

List of Instrument	
1.	Clean rooms
2.	Deep freezers
3.	freeze dryers
4.	Biosafety cabinets

For further information, please contact:

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 Coordinator  
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 +(6) 09-7674039  
[banktisu@usm.my](mailto:banktisu@usm.my)

### c. Immunology Laboratory

Consisting of 20 core staff members including clinical and scientific lecturers, scientific officers and clinical laboratory technologists, the Department is actively engaged in routine laboratory tests to aid in the diagnosis of patients with immunological disorders as well as other conditions related to the immune system.

Principal investigators and researchers within the Department have consistently generated new knowledge through our research and distribute that knowledge through teaching involving both the medical and health sciences students.

Apart from invariably providing high quality clinical diagnostic services, achieving MS ISO certifications and externally audited management standards, we have continually aspired to strive for an ever-vibrant research environment, to increase novel scientific discoveries and translatable research, in parallel with the emphasis of knowledge-economy that fuels the growth of the country towards a developed nation.

Accredited Services	
1.	Anti-Nuclear Antibody (ANA)
2.	Anti-Double Stranded DNA Antibody (anti-dsDNA)
3.	Extractable Nuclear Antigen Antibody (ENA) <ul style="list-style-type: none"> <li>■ [Nucleosome, Histone, SmD1, PCNA, PO/RPP, CENP-B, Scl 70, AMA M2, SS-A/Ro 60 kD, SS-A/ Ro 52 kD, SS-B/La, U1-snRNP, Jo-1, PM-Scl, Mi-2, Ku]</li> </ul>
4.	C-Reactive Protein (CRP)
5.	Allergen-Specific IgE Assay
6.	Enumeration of Lymphocyte Subsets (TBNK) <ul style="list-style-type: none"> <li>■ HIV-positive patient</li> <li>■ Immunodeficiency paediatric patient</li> </ul>

Non-Accredited Services	
1.	Anti-Smooth Muscle Antibody (ASMA)
2.	Anti-Mitochondrial Antibody (AMA)
3.	Anti-Neutrophil Cytoplasmic Antibody (ANCA)
4.	Anti-Cardiolipin Antibody (ACA)
5.	Alpha-Feto Protein (AFP)
6.	Urine Pregnancy Test (UPT)
7.	Rheumatoid Factor (RF)
8.	Anti-Cyclic Citrullinated Peptide Antibody (ACCPA)
9.	Complement 3, Complement 4 (C3C4)
10.	Immunoglobulin G, A, M (Ig GAM)
11.	HLA Typing Test
12.	Neutrophil Function Test

List of Instrument	
1.	BD FACSCanto II Flow Cytometer
2.	Olympus FSX100 Fluorescent Microscope
3.	Olympus XC50 Fluorescent Microscope
4.	BN ProSpecÂ® Nephelometer
5.	ImmunoCAP 100 System
6.	Orion Diagnostica QuikRead go



7.	Sysmex XS-800i Haematology Analyzer
8.	Applied Biosystems VeritiPro PCR Thermal Cycler
9.	UVP Bioimaging System
10.	Epoch Microplate Spectrophotometer

For further information, please contact:

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 Immunology Laboratory,  
 Department of Immunology,  
 School of Medical Sciences,  
 Universiti Sains Malaysia,  
 16150 Kubang Kerian, Kelantan, Malaysia  
 +(6) 09-7674000  
[kahkeng@usm.my](mailto:kahkeng@usm.my)

#### d. Chemical Pathology Department

Chemical Pathology Department consists of laboratories that involve in testing of various biochemical analytes in blood and other body fluids. As a laboratory that is accredited in ISO 15189, it is our responsibility to ensure that the samples that we receive are handled properly and the result that we provide to our clients are of good quality, and on time. In order to provide excellent services, our laboratory is equipped with high throughput and well-maintained analyzers and our tests are enrolled in external quality assurance programme. In term of human resources, all our laboratory consultants/chemical pathologists are well competent and registered under National Specialist Registration. We also have well competent science officers and a good number of medical laboratory technologists to ensure the smooth running of the laboratory services.

#### (1) Chemical Pathology Laboratory

Accredited Services	
1.	Routine Chemistry
	■ Alanine Aminotransferase
	■ Albumin
	■ Alkaline Phosphatase
	■ Amylase
	■ Arterial Blood Gas
	■ Aspartate Aminotransferase
	■ Bilirubin Total
	■ Bilirubin Conjugated
	■ Calcium
	■ Chloride
	■ Creatine Kinase
	■ Creatinine
	■ Cholesterol
	■ HDL- Cholesterol
	■ Lactate Dedydrogenase
	■ Magnesium
	■ Osmolality

■ Phosphate
■ Potassium
■ Sodium
■ Total Protein
■ Triglyceride
■ Urea
■ Uric Acid
2. Plasma
■ Glucose
3. Whole Blood
■ Arterial Blood Gas
4. Tumor Marker
<i>Serum</i>
■ Prostate Specific Antigen (PSA)
■ CA 125
■ CEA

<b>Non-Accredited Services</b>
<i>Urine and body fluid chemistry, Inborn error test and special protein</i>
1. 24 Hour Urine
■ Creatinine Clearance
■ Magnesium
■ Osmolality
■ Phosphate
■ Potassium
■ Protein
■ Sodium
■ Urea
■ Uric Acid
2. Cerebrospinal Fluid (CSF)
■ Chloride
■ Lactate
■ LDH
■ CSF Biochemistry (Protein glucose)
3. Dialysate
■ Creatinine
■ Glucose
■ Total Protein
■ Urea
4. Pericardial Fluid
■ Biochemistry (Protein glucose)
■ Chloride
■ LDH

5.	Peritoneal Fluid
	■ Albumin
	■ Amylase
	■ Biochemistry
	■ LDH
6.	Plasma
	■ Amino Acid
	■ Ammonia
7.	Pleural Fluid
	■ Biochemistry
	■ Chloride
	■ Cholesterol
	■ LDH
	■ Triglyceride
8.	Protein Electrophoresis in Serum and Urine
9.	Serum
	■ Gamma Glutamyl Transferase (GGT)
	■ Iron
	■ Troponin T
	■ Unbind Iron Binding Capacity (UIBC)
	■ TIBC (Iron & UIBC)
10.	Urine
	■ Amylase/Diastase
	■ Calcium
	■ Chloride Spot
	■ Creatinine
	■ FEME
	■ Magnesium
	■ Mucopolysaccharidosis (MPS) Screening + HRE
	■ Organic Acid
	■ Osmolality
	■ PCI (Protein Creatinine Index)
	■ Phosphate
	■ Potassium
	■ Total Protein
	■ Urea
	■ Uric Acid
	■ Sodium

#### List of Instrument

1.	Chemistry Analyzer (Architect c8000)
2.	Osmometer (Osmomat 3000)
3.	High Performance Liquid Chromatography (HPLC) Biochrom 30 Plus
4.	Electrophoresis System (SebiaHydrasys 2)
5.	Immunoassay Analyzer Cobas e411

6.	Urine Microscopic Analyzer (Cobas u701)
7.	High Resolution Electrophoresis (HRE)
8.	Cobas E411
9.	ABG analyzer radiometer ABL90 flex
10.	GCMS Shimadzu Qp2010

## (2) Endocrine Laboratory

Accredited Services	
1.	Serum
	<ul style="list-style-type: none"> <li>■ Thyroid stimulating hormone</li> <li>■ Free thyroxine (T4)</li> <li>■ Free triiodothyronine (T3)</li> <li>■ Intact Human Chorionic Gonadotropin + the <math>\beta</math>-subunit (Total HCG)</li> <li>■ Cortisol</li> </ul>
2.	Whole Blood
	<ul style="list-style-type: none"> <li>■ HbA1C</li> </ul>

Non-Accredited Services	
1.	Serum
	<ul style="list-style-type: none"> <li>■ Anti-Thyroglobulin</li> <li>■ Anti-Thyroid peroxidase</li> <li>■ C-Peptide</li> <li>■ DHEA SO4</li> <li>■ Estradiol</li> <li>■ FSH</li> <li>■ Growth Hormone (GH)</li> <li>■ Insulin</li> <li>■ Intact PTH</li> <li>■ Leutinizing Hormone (LH)</li> <li>■ Progesterone</li> <li>■ Prolactin</li> <li>■ Cortisol</li> <li>■ Testosterone</li> <li>■ Thyroglobulin</li> <li>■ 17 - OH Progesterone</li> <li>■ Aldosterone</li> <li>■ Insulin Growth Factor 1</li> <li>■ TSH receptor Autoantibody</li> </ul>
2.	Plasma
	<ul style="list-style-type: none"> <li>■ Renin Activity</li> <li>■ ACTH</li> </ul>
3.	Urine
	<ul style="list-style-type: none"> <li>■ Free Cortisol</li> </ul>

<b>List of Instrument</b>	
1.	Cobas E601
2.	ELISA
3.	Gamma Counter

For further information, please contact:

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## SCHOOL OF PHYSICS

### a. Nano-Optoelectronics Research and Technology Laboratory (NOR Lab)

Nano-Optoelectronics Research and Technology Laboratory (NOR), School of Physics, USM was soft launched by the Deputy Vice Chancellor of Research and Innovation, Y. Bhg. Profesor Dato' Dr. Muhammad Idris Salleh, on the 20th of November 2004. Services offered include characterization and testing of nanomaterials and devices. It has an extensive range of equipment and facilities which enable the fabrication of semiconductor devices and characterization of optoelectronic materials at the nanoscale. Total floor area is approximately 870 m<sup>2</sup>. The fabrication equipment such as e-beam evaporator system, sputtering system (RF and DC) and furnace are capable to produce nanoscale thin films, and the nanoscale characterization tools such as Field Emission Scanning Electron Microscopy (FESEM), Atomic Force Microscopy (AFM), UV-VIS Spectrophotometer, High Resolution X-Ray Diffraction (HRXRD), Raman and Photoluminescence spectroscopy system, Hall Effect and Capacitance-Voltage/Current-Voltage (CV/IV) measurement systems are equipped to probe into the structural, optical and electrical properties of the materials.

Non-Accredited Services	
1.	Field Emission Scanning Electron Microscope (FESEM)
2.	Atomic Force Microscopy (AFM)
3.	High Resolution X-Ray Diffractometer (HRXRD),
4.	UV-Visible-NIR spectrophotometer
5.	DC/RF sputtering system
6.	Fourier Transform Infrared Spectroscopy (FTIR)
7.	PL Raman
8.	Hall effect
9.	Vacuum coater



List of Instrument	
1.	Field Emission Scanning Electron Microscope (FESEM)
2.	Atomic Force Microscopy (AFM)
3.	High Resolution X-Ray Diffractometer (HRXRD)
4.	UV-Visible-NIR spectrophotometer
5.	DC/RF sputtering system
6.	Fourier Transform Infrared Spectroscopy (FTIR)
7.	PL Raman
8.	Hall effect
9.	Vacuum coater

For further information, please contact:

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Research Officer

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#### b. Thermal Management Research Laboratory (TMRL)

TMRL was established in 2010 to conduct research on improving the performance of optoelectronic devices such as LED (for Solid State Lighting, (SSL)) and its research has been focused on advanced material and packaging technologies including thermal management. Simulation, testing and reliability studies are carried out to solve the thermal related issues in SSL and electronic packaging products.

Non-Accredited Services	
1.	Thermal conductivity
2.	Thermal imaging
3.	Thermal resistance
4.	Thin film thickness
5.	Thermal/optical performance of LED
6.	Thermo-mechanical simulation

List of Instrument	
1.	Thermal Conductivity (TC-TPS 2500S)
2.	Thermal Imaging IR camera
3.	T3Ster Thermal transient analyzer
4.	Thin film thickness analyzer (MProbe UVVISNIR- MSP)
5.	TeraLED radiometric characterization
6.	Thermo-mechanical simulation of CAD model (FloEFD/COMSOL)

For further information, please contact:

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School of Physics

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## SCIENCE & ENGINEERING RESEARCH CENTRE (SERC)

SERC is a two-storey building which covers an area of 6,178.23 square meters. Various research laboratories, research equipment rooms with high-end and state-of-the-art research instruments and corporate facilities are available at SERC. Known as the frontier of shared facility and shared services at USM, SERC will give it full commitment to serve the University agenda and acculturate world class research.

Accredited Services	
1.	Tensile Testing for Plastics and Plastics Composite (ASTM D638)
2.	Flexural Testing for Plastics and Plastics Composite (ASTM D790)

Non-Accredited Services	
1.	Microscopy & Analytical Imaging <ul style="list-style-type: none"> <li>■ Analyse physical structures and defects the images of the materials from different depths and size from micron to nanoscale.</li> <li>■ Surface structures</li> <li>■ Sub-surface structures</li> <li>■ Bulk structures</li> <li>■ Micron-scale structures</li> <li>■ Atomic or Nanoscale structures</li> </ul>
2.	Adhesion, Bonding & Coating <ul style="list-style-type: none"> <li>■ Determine adhesive, bonding, or coating system.</li> <li>■ Investigate and locate the contaminant that causes the bonding failure.</li> <li>■ Investigate various characteristics of epoxy adhesive and coating</li> </ul>
3.	Chemical and Elemental Maps <ul style="list-style-type: none"> <li>■ Characterize element or chemical content of a top most surface, near-surface, bulk, or exposed interior region of samples.</li> <li>■ Analyse using a single spot or an area by raster scanning.</li> </ul>
4.	Chemical Analysis

	<ul style="list-style-type: none"> <li>■ Determination of chemical identity, qualitative composition, and impurities.</li> <li>■ Detection of trace organic compounds and metals.</li> <li>■ Identification of residues.</li> </ul>
5.	Contamination <ul style="list-style-type: none"> <li>■ Determine the contamination on the surface, near-surface, or inside the bulk materials or products.</li> <li>■ Identify the presence of contaminating polymeric material when the thermal properties of the contaminant and the base resin are different</li> </ul>
6.	Failure Analysis <ul style="list-style-type: none"> <li>■ Characterization and analysis for failure and fracture of the sample.</li> <li>■ Detect morphological changes associated with aging in the materials</li> </ul>
7.	Elemental Analysis <ul style="list-style-type: none"> <li>■ Identification and quantification of elements in a diverse range of samples.</li> <li>■ Determination of elemental composition.</li> <li>■ Detect elemental trace and ultra-trace analysis range from parts per million (ppm) until parts per billion (ppb) level.</li> </ul>
8.	Material/Nanomaterials Characterization <ul style="list-style-type: none"> <li>■ Characterize the material or nanomaterials by: <ul style="list-style-type: none"> <li>□ Surface chemical analysis</li> <li>□ Near-surface chemical analysis</li> <li>□ Atomic and nano chemical analysis</li> <li>□ Surface imaging</li> <li>□ Defect/ failure analysis</li> <li>□ Analytical imaging</li> </ul> </li> </ul>

<b>List of Instrument</b>	
1.	HRTEM – High-Resolution Transmission Electron Microscopy
2.	XPS – X-Ray Photoelectron Spectroscopy
3.	XHR-FESEM – Extreme High Resolution-Field Emission Scanning Electron Microscopy
4.	FTIR – Fourier Transform Infrared - Imaging
5.	ICP-MS – Inductive Coupled Plasma Spectrometer
6.	LSM – Laser Confocal Scanning Microscope
7.	RAMAN – Raman Spectroscopy
8.	HPLC – High Performance Liquid Chromatography
9.	UTM – Universal Testing Machine
10.	DSC – Differential Scanning Calorimeter
11.	GC-MS – Gas Chromatography Mass Spectrometry

For further information, please contact:

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# **NON-LABORATORY SERVICES**

(TRAINING, CONSULTATION AND OTHERS)





## PUSAT PENGETAHUAN, KOMUNIKASI DAN TEKNOLOGI (PPKT)

### a. COMPUTER LAB

#### Non-Accredited Services

1. Computer lab rental

#### List of Instrument

1. Multimedia Laboratory (40 units desktop PCs)
2. Teaching Laboratory (140 units desktop PCs)

For further information, please contact:

Mohd Kusairay Musa  
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## INSTITUTE OF NANO OPTOELECTRONICS RESEARCH AND TECHNOLOGY (INOR)

### a. Professional Development Courses (PDC)

Modules offered:

#### Non-Accredited Services

1. Theoretical modules include Theoretical LED Technology, Theoretical Metalorganic Chemical Vapor Deposition (MOCVD), Theoretical Fabrication, and Theoretical Packaging. (Also offered as online courses)
2. Experimental modules include Experimental Metalorganic Chemical Vapor Deposition (MOCVD) and Characterization, Experimental Fabrication and Characterization, and Experimental Packaging and Characterization.

For further information, please contact:

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Senior Lecturer

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## ISLAMIC CENTRE

### a. Facility Rental Services

Providing accommodation, seminar/workshop hall, dining hall and catering rental services

List of Facilities	
1.	Guest Room
2.	Banquet Room
3.	Deliberation Hall
4.	Catering (Food Preparation)

For further information, please contact:

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[pislam@usm.my](mailto:pislam@usm.my)



## NATIONAL HIGHER EDUCATION RESEARCH INSTITUTE (IPPTN)

### Non-Accredited Services

1. Research, training and consultation
2. Depends of the programme

For further information, please contact:

Institut Penyelidikan Pendidikan Tinggi Negara (IPPTN),  
Universiti Sains Malaysia  
Level 2, Block C, sains@usm,  
No. 10, Persiaran Bukit Jambul, 11900, Bayan Lepas, Pulau Pinang, MALAYSIA.  
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## NATIONAL POISON CENTRE (NPC) USM

### The Drug and Poison Information Service (DPIS)

The Drug and Poison Information Service (DPIS) is a dedicated call centre of the Malaysia National Poison Centre under USM. This call centre provides a referral service for poisoning emergencies, incidents of overdose, chemical safety and other related issues. Trained pharmacists operate the call centre during office hours and provide additional service in the evening, weekends and public holidays (7 days a week, 365 days a year).

Besides the call centre, DPIS also offers a web-based system designed to enhance the effectiveness and efficiency of the country's toxicology-related research and services called MyToxData (an acronym for Malaysian Toxicological Database). This system functions as a one-stop site for toxicology case reporting/notification, drug/poison identification, retrieval of clinical information, access to statistics of reported poisoning agents and chemical-based products database targeting multilevel users (using secure log-in access for data protection).

PIS also offers a training package that provides exposure to undergraduate and postgraduate students on the basics of Drug and Poison Information Services (DPIS) and the roles of its staff/personnel in promoting rational use of medicines and chemical safety.

National Poison Centre actively provides consultation to product founders and owners, with emphasis on cosmetic and traditional medicine products and the importance of producing safe and high-quality products in the market through training and laboratory testing. These programs can be conducted in a few series according to the course-ware developed, and customizable upon request.

#### a. Call Centre for Drug and Poison Information Service

Non-Accredited Services	
1.	Poisoning case consultation and general drug/poison information service
2.	Drug and poison information attachment program for healthcare providers and students in related fields.
3.	Training packages in management of common acute poisoning for healthcare providers.
4.	Drug/Poison education and prevention package programs for targeted community members or the public.
5.	Review of poisoning management guidelines or safety/toxicology datasheets.
6.	Consultation of poisoning management guideline documents
7.	Material Safety Datasheet translation/review services for chemical/pesticide companies
8.	Consultation for technical documentation on drug toxicity/pesticides/other chemicals
9.	Consultation with attorneys regarding drug/poison related legal cases

For further information, please contact:

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Email: [prnnet@usm.my](mailto:prnnet@usm.my)

Website: <https://prn.usm.my>

#### b. MyToxData - Online Toxicology Information Service

Non-Accredited Services	
1.	Toxicology/Poisoning case notification (data collection/research platform)
2.	Drug/Poison identification for local chemical/pharmaceuticals products
3.	Toxicity and clinical information retrieval for healthcare providers in managing poisoned patients
4.	Local chemical product database
5.	Retrieval of up-to-date poisoning statistical report for relevant authorities/policy makers
6.	System customization and maintenance for licensed users

For further information, please contact:

RPh Adilah Mohamed Ariff

National Poison Centre, Universiti Sains Malaysia, 11800 Minden, Pulau Pinang

Phone: +(6) 04-6570099 / +(6) 012-4309499

Email: [mytoxdata@usm.my](mailto:mytoxdata@usm.my)

Website: <https://mytoxdata.usm.my>

### c. Undergraduate Student Training

List of Subjects/Packages	
1.	Self-learning online platform package
	<ul style="list-style-type: none"> <li>■ Introduction to the National Poison Centre USM</li> <li>■ Module 1: Introduction to Drug and Poison Information Service</li> <li>■ Module 2: Evidence from Drug and Poison Information Sources and Clinical Literatures</li> <li>■ Module 3: Internet as a Source of Reference</li> <li>■ Module 4: How to Critically Appraise a Drug and Poison Paper?</li> <li>■ Module 5: How to Handle Drug and Poison Enquiries?</li> </ul>
2.	Topics in live session (upon completion of self-learning lessons)
	<ul style="list-style-type: none"> <li>■ Hands-on activity – Poisoning simulation cases</li> <li>■ Skills assessment and case discussion</li> </ul>
3.	Additional modules (optional) – Live sessions
	<ul style="list-style-type: none"> <li>■ Module 6: What is Poison and Poisoning?</li> <li>■ Module 7: Roles of Healthcare Providers in Assessing the Risk of Poisoning Exposure and Poisoning Prevention</li> <li>■ Module 8: Management of Acute Poisoning-General Approaches</li> <li>■ Module 9: Common Pharmaceutical Poisoning &amp; Case Studies</li> <li>■ Module 10: Common Household Poisoning</li> <li>■ Module 11: Animal Toxicology</li> <li>■ Module 12: Common Poisonous plants</li> <li>■ Module 13: Pesticide Poisoning</li> <li>■ Module 14: Industrial Chemical Poisoning</li> <li>■ Module 15: Toxicological Analysis: What and When to Measure?</li> </ul>

### d. Health and Clinical Toxicology Training Package for Healthcare Providers

List of Subjects/Packages	
1.	Self-learning online platform package
	<ul style="list-style-type: none"> <li>■ Introduction to the National Poison Centre USM</li> <li>■ Module 1: Introduction to Drug and Poison Information Service</li> <li>■ Module 2: Evidence from Drug and Poison Information Sources and Clinical Literatures</li> <li>■ Module 3: Internet as a Source of Reference</li> <li>■ Module 4: How to Critically Appraise a Drug and Poison Paper?</li> <li>■ Module 5: How to Handle Drug and Poison Enquiries?</li> </ul>
2.	Topics in live session (upon completion of self-learning lessons)
	<ul style="list-style-type: none"> <li>■ Hands-on activity – Poisoning simulation cases</li> <li>■ Skills assessment and case discussion</li> </ul>
3.	Additional modules (optional) – Live sessions
	<ul style="list-style-type: none"> <li>■ Module 6: What is Poison and Poisoning?</li> <li>■ Module 7: Roles of Healthcare Providers in Assessing the Risk of Poisoning Exposure and Poisoning Prevention</li> </ul>

■ Module 8: Management of Acute Poisoning-General Approaches
■ Module 9: Common Pharmaceutical Poisoning & Case Studies
■ Module 10: Common Household Poisoning
■ Module 11: Animal Toxicology
■ Module 12: Common Poisonous plants
■ Module 13: Pesticide Poisoning
■ Module 14: Industrial Chemical Poisoning
■ Module 15: Toxicological Analysis: What and When to Measure?

For further information, please contact:

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Email: [prnnet@usm.my](mailto:prnnet@usm.my)  
Website: <https://prn.usm.my>

**e. Introduction to the National Poison Centre Course (Open Learning)**

Access to this course can be found at the following link: <https://www.openlearning.com/courses/introduction-to-national-poison-centre>

**f. Micro-Credential Short Course: Drug and Poison Information Service**

Non-Accredited Services	
1.	Module 1: Introduction to Drug and Poison Information Service USM
2.	Module 2: Evidence retrieved from Drug and Poison Information Sources and Clinical Literatures
3.	Module 3: Internet as a Source of Reference
4.	Module 4: How to Critically Appraise a Drug and Poison Paper?
5.	Module 5: How to handle drug and poison enquiries?

Access to this course can be found at the following link: <https://learning4life.usm.my/qualifications/dpis/>

**g. Massive Open Online Course: Statistical Analysis for Research**

Non-Accredited Services	
1.	<b>Module 1</b> – Introduction to Statistics
2.	<b>Module 2</b> – Simple Comparative Experiments
4.	<b>Module 3</b> – t-Tests
4.	<b>Module 4</b> - Analysis of Variance (ANOVA)
5.	<b>Module 5</b> – Factorial Designs
6.	<b>Module 6</b> – Correlation and Regression



Access to this course can be found at the following link: <https://www.openlearning.com/courses/statistical-analysis-for-research/?cl=1>

For further information, please contact:

RPh Asdariah Misnan  
Micro Credential Coordinator  
National Poison Centre, Universiti Sains Malaysia, 11800 Minden, Pulau Pinang  
Phone: +(6) 04-6570099 / +(6) 012-4309499  
Email: [prnnet@usm.my](mailto:prnnet@usm.my)  
Website: <https://prn.usm.my>

#### **h. High Quality and Safe Cosmetic and Traditional Products Production Course**

<b>Non-Accredited Services</b>	
1.	Basic knowledge of safe and high quality products focusing on cosmetics and traditional medicines
2.	Responsibility of product owners to ensure their products are safe and of high quality
3.	Product notification/registration processes set by the National Pharmaceutical Regulatory Agency (NPRA)
4.	The importance of product testing according to NPRA accredited laboratories
5.	Possible adulterants and Food-Drug Interphase (FDI) substances present in products and their adverse effects
6.	Do's and Don'ts tips for product owner

For further information, please contact:

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Training Coordinator  
National Poison Centre, Universiti Sains Malaysia, 11800 Minden, Pulau Pinang  
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Email: [prnnet@usm.my](mailto:prnnet@usm.my)  
Website: <https://prn.usm.my>



## PUSAT TEKNOLOGI PENGAJARAN DAN MULTIMEDIA (PTPM)

### a. Makmal Komputer 3

Provides facility for teaching and learning purposes including training sessions to staff and outsiders.

For further information, please contact:

Muhammad Akhmal Bin Pamuda  
Pembantu Tadbir (perkeranian/operasi)  
Bangunan D11, Universiti Sains Malaysia,  
11800 USM, Pulau Pinang  
+(6) 04-6534185  
[akhmal\\_pamuda@usm.my](mailto:akhmal_pamuda@usm.my)



## SCHOOL OF EDUCATIONAL STUDIES

### a. Counseling Services

Counseling Clinic, Consultation, Basic Counseling Workshop, Webinar

For further information, please contact:

Associate Professor Dr. Nor Shafrin Ahmad  
 Pusat Pengajian Ilmu Pendidikan  
 +(6) 04-6532569  
[sham@usm.my](mailto:sham@usm.my)

### b. Special and Inclusive Education/Early Childhood Care and Education Services

#### Non-Accredited Services

1. Workshop about parenting skills
2. Workshop about inclusive teaching pedagogies
3. Consultant for speech and language therapy
4. Consultant for inclusive education
5. Research and academic webinar

For further information, please contact:

Associate Professor Dr. Low Hui Min  
 Pusat Pangajian Ilmu Pendidikan  
 +(6) 04-6535419  
[lowhm@usm.my](mailto:lowhm@usm.my)

### c. Education For Sustainable Development

For further information, please contact:

Dr. Nor Asniza Ishak  
 Pusat Pengajian Ilmu Pendidikan  
 +(6) 04-6535184  
[asnizaishak@usm.my](mailto:asnizaishak@usm.my)

#### d. Statistic Services

##### Non-Accredited Services

1. SPSS/ CVI/ Rasch Model

For further information, please contact:

Associate Professor Dr. Aziah Ismail  
Pusat Pengajian Ilmu Pendidikan  
+(6) 04-6533236  
[aziah@usm.my](mailto:aziah@usm.my)





## SCHOOL OF HUMANITIES

Geoinformation science which include Urban and Regional Planning, Hydrology, Environmental Studies, Economic and Industrial Development, Biodiversity and Conservation, Industrial Technology, Marine and Coastal Studies, and disaster risk reduction and recovery with the human well-being as the organizing principle of the work.

Non-Accredited Services	
1.	GIS mapping & geodatabase development
2.	Satellite images processing & analysis
3.	Questionnaire survey & depth interview analysis
4.	GIS and remote sensing training
5.	Research skills development training.
6.	Focus group discussion development training

For further information, please contact:

Gs. Dr. Tan Mou Leong  
GeoInformatic Unit, Geography Section, School of Humanities  
+(6) 017-9720529  
[mouleong@usm.my](mailto:mouleong@usm.my)

### a. Malay Language and Linguistics

We also offer linguistic services and language skills in Malay.

For further information, please contact:

Dr. Norsofiah Abu Bakar  
Lecturer  
Malay Linguistics Section, School of Humanities  
+(6) 04-6532873  
[abnorsofiah@usm.my](mailto:abnorsofiah@usm.my)

## **SCHOOL OF LANGUAGES, LITERACIES AND TRANSLATION**

Translation Services, Language editing (Malay, English and Foreign Languages); Customized Language Courses, Short Term Language Courses (local and international); In-house Language Courses; Intensive English Program

For further information, please contact:

Azril Ali

Deputy Dean of Academic, Career and International

School of Languages, Literacies and Translation, Universiti Sains Malaysia, 11800 Penang

+(6) 04-6533145

[azril@usm.my](mailto:azril@usm.my)



## SCHOOL OF MATHEMATICAL SCIENCES

### a. Statistical Short Courses/Data Analysis

There are about 10-15 Statistical short courses conducted yearly attended by government and non-governmental departments, Industries, academics, and students.

#### Non-Accredited Services

1. Short Courses

For further information, please contact:

Dr. Zainudin Arsad

Senior Lecturer DS52

School of Mathematical Sciences, Universiti Sains Malaysia (USM), 11800 Penang.

+(6) 04-6533284

[zainudin.arsad@usm.my](mailto:zainudin.arsad@usm.my)



## SCHOOL OF PHARMACEUTICAL SCIENCES

### a. Budget Impact Analysis of Pharmaceutical Product/Service

### b. Cost Effectiveness of Pharmaceutical Product/Service

In many countries, the health authority or reimbursement agency has made pharmaco-economic analysis compulsory for listing or reimbursing of new pharmaceutical product. Budget Impact Analysis (BIA) and Cost Effectiveness Analysis (CEA) are two critical pharmaco-economic analysis that are required by the many authorities to demonstrate economic value of a pharmaceutical product. Universiti Sains Malaysia is the primer reference for pharmaco-economic in Malaysia and has long standing experience in consulting, and training in the service.

#### Non-Accredited Services

1. Budget Impact Analysis of Pharmaceutical Product/Service
2. Cost Effectiveness of Pharmaceutical Product/Service

For further information, please contact:

Professor Dr. Asrul Akmal Shafie  
Discipline of Social & Administrative Pharmacy,  
School of Pharmaceutical Sciences,  
Universiti Sains Malaysia  
+(6) 012-4252290  
[aakmal@usm.my](mailto:aakmal@usm.my)



## SCHOOL OF THE ARTS

### a. GRAPHIC DESIGN & PRINTING

UDESIGN & KEBUDAYAAN is a unit in school of the arts that offer graphic design and printing services.

Non-Accredited Services	
1.	Graphic Design for Printing
2.	Graphic Design for Digital Content
3.	Printing
4.	Graphic Consultation

For further information, please contact:

En. Shahril Effendi Shahardin  
Pegawai Kebudayaan  
Udesign & Kebudayaan,  
Pusat Pengajian Seni  
Universiti Sains Malaysia  
11800 USM  
PULAU PINANG  
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