



Master of Science (Health Toxicology)

Programme Book for 2022/2023 Academic Session

Mixed Mode

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INTRODUCTION TO AMDI

The preceding decade has witnessed numerous new developments with regards to medical knowledge, medical technology and healthcare. To avoid being left behind, it is imperative that we initiate steps to be more innovative in exploiting these new advances for the benefit of patients, particularly in Malaysia and throughout the Asia Pacific. To realise this aim, the Malaysian government has taken the initiative in establishing the Advanced Medical and Dental Institute (AMDI) which will function to manifest these aspirations particularly for the benefit of the public in the northern part of Peninsular Malaysia as well as the whole of Malaysia.

The main mission of AMDI is to function as the prime catalyst in producing specialists and scientists in both medical and dental fields, who are competent, holistic and contemporary in their practice and profession as well as capable of generating novel discoveries. AMDI adopts a comprehensive approach, embracing both the clinical and the pure sciences in all aspects of operationalisation. It is envisioned that this “cross fertilisation” philosophical approach will foster a fertile and inventive environment that increases the probability of new discoveries in both dentistry and medicine. The AMDI infrastructure has been designed to facilitate this cross-fertilisation approach.

The operational structure of AMDI, encompassing both clinical services and administration, classifies a functioning entity as a “cluster” consisting of specialists from various disciplines and specialisations. The collaborative approach, involving both specialists and researchers, is in tandem with the aspirations of USM, i.e. raising the standards of research and teaching activities. AMDI will place great emphasis on medical and dental studies at the postgraduate level. The postgraduate medical and dental studies programme is supported by the teaching faculty of all clusters. The selection of courses to be offered also take into consideration services yet to be provided by the Malaysian Health Ministry so that there will be no overlapping of programmes.

With regards to academic programmes, AMDI will focus on postgraduate programmes such as Master of Medicine (specialisation), Master of Science (coursework mode) and research mode programmes at master’s and doctorate levels. AMDI will initiate efforts to offer sub-specialisation medical courses such as Master Specialisation and in medical sub-categories. AMDI also plans to offer new programmes at Master’s and doctorate levels as well as new “sandwich” programme, i.e., M. Med/PhD which is envisioned as the products of the integration of pure and clinical science approach propounded by AMDI.

WELCOMING REMARKS

Dear students,

I would like to warmly welcome you to Advanced Medical and Dental Institute (AMDI), USM. Congratulations for being accepted for MSc Health Toxicology programme offered by Integrative Medicine Cluster, AMDI. M.Sc Health Toxicology programme which is a brainchild of AMDI and National Poison Centre is a mixed-mode programme started in 2010, and one of a kind to be offered in Malaysia so far. This programme was designed to produce scientists competent in health toxicology field specifically in clinical, environmental and occupational toxicology.

It is the aim of the programme to prepare the candidates to become toxicologists that will assume a variety of roles in academia, industry and government. These include teaching, basic research on toxicology-related, risk analysis to characterise and predict the potential of chemicals which present in environment or occupational- related that could produce acute and chronic illnesses in human populations and others.

We are hoping that you will make the best of what available in AMDI and USM and enjoy the experience of pursuing MSc. Health Toxicology programme and be it the steppingstone towards advancement in the future career in Toxicology discipline. With all support and contributions from AMDI's, National Poison Centre and Health Campus staff, we are hoping high that this programme would competitively grow to be one of the leading Toxicology programme to suit the needs of the nation.

Finally, I would like to wish all the candidates all the best and it is an honor to accept you to be our tenth batch for this programme.

YM. Profesor Dr. Tunku Kamarul Zaman Bin Zainol Abidin

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CALENDAR ACADEMIC – ACADEMIC SESSION 2022/2023

Note:

- i. New Coursework/Mixed/Online mode students' registration can be completed via online process from 7 until 9 October 2022.
- ii. New Research mode students' registration can be completed anytime.

| SEM | MINGGU | AKTIVITI | TARIKH | CATATAN |
|-------|--|---|--------------------------------------|--|
| SEM 1 | 1 | (P&P 7 Minggu) | Isnin, 17.10.2022 - Ahad, 23.10.2022 | |
| | 2 | | Isnin, 24.10.2022 - Ahad, 30.10.2022 | 24.10.2022, Isnin - Hari Deepavali** |
| | 3 | | Isnin, 31.10.2022 - Ahad, 06.11.2022 | |
| | 4 | | Isnin, 07.11.2022 - Ahad, 13.11.2022 | 11, 12 & 13.11.2022, Jumaat, Sabtu & Ahad - Hari Keputeraan Sultan Kelantan (Kelantan) |
| | 5 | | Isnin, 14.11.2022 - Ahad, 20.11.2022 | |
| | 6 | | Isnin, 21.11.2022 - Ahad, 27.11.2022 | |
| | 7 | | Isnin, 28.11.2022 - Ahad, 04.12.2022 | |
| | 8 | Cuti Pertengahan Semester (1 Minggu) | Isnin, 05.12.2022 - Ahad, 11.12.2022 | |
| | 9 | (P&P 7 Minggu) | Isnin, 12.11.2022 - Ahad, 18.12.2022 | |
| | 10 | | Isnin, 19.12.2022 - Ahad, 25.12.2022 | 25.12.2022, Ahad - Hari Krismas |
| | 11 | | Isnin, 26.12.2022 - Ahad, 01.01.2023 | 26.12.2022, Isnin - Hari Krismas (cuti ganti) 01 & 02.01.2023, Ahad & Isnin - Tahun Baharu 2023 |
| | 12 | | Isnin, 02.01.2023 - Ahad, 08.01.2023 | |
| | 13 | | Isnin, 09.01.2023 - Ahad, 15.01.2023 | |
| | 14 | | Isnin, 16.01.2023 - Ahad, 22.01.2023 | 22.01.2023, Ahad - Tahun Baharu Cina |
| | 15 | | Isnin, 23.01.2023 - Ahad, 29.01.2023 | 23 & 24.01.2023, Isnin & Selasa - Tahun Baharu Cina |
| | 16 | Minggu Ulang Kaji (1 Minggu) | Isnin, 30.01.2023 - Ahad, 05.02.2023 | 04.02.2023, Sabtu - Hari Thaipusam** |
| | 17 | Peperiksaan (3 Minggu) | Isnin, 06.02.2023 - Ahad, 12.02.2023 | |
| | 18 | | Isnin, 13.02.2023 - Ahad, 19.02.2023 | |
| | 19 | | Isnin, 20.02.2023 - Ahad, 26.02.2023 | |
| | 20 | Cuti Antara Semester/ Latihan Industri (4 Minggu) | Isnin, 27.02.2023 - Ahad, 05.03.2023 | |
| | 21 | | Isnin, 06.03.2023 - Ahad, 12.03.2023 | |
| | 22 | | Isnin, 13.03.2023 - Ahad, 19.03.2023 | |
| | 23 | | Isnin, 20.03.2023 - Ahad, 26.03.2023 | 23.03.2023, Khamis - Awal Ramadhan |
| SEM 2 | 24/1 | (P&P - 7 Minggu) | Isnin, 27.03.2023 - Ahad, 02.04.2023 | |
| | 25/2 | | Isnin, 03.04.2023 - Ahad, 09.04.2023 | 08.04.2023, Sabtu - Nuzul Al-Quran |
| | 26/3 | | Isnin, 10.04.2023 - Ahad, 16.04.2023 | |
| | 27/4 | | Isnin, 17.04.2023 - Ahad, 23.04.2023 | 22 & 23.04.2023, Sabtu & Ahad - Hari Raya Aidilfitri** |
| | 28/5 | | Isnin, 24.04.2023 - Ahad, 30.04.2023 | 24.04.2023, Isnin - Hari Raya Aidilfitri** |
| | 29/6 | | Isnin, 01.05.2023 - Ahad, 07.05.2023 | 01.05.2023, Isnin - Hari Pekerja 04.05.2023, Khamis - Hari Wesak |
| | 30/7 | | Isnin, 08.05.2023 - Ahad, 14.05.2023 | |
| | 31/8 | Cuti Pertengahan Semester (1 Minggu) | Isnin, 15.05.2023 - Ahad, 21.05.2023 | |
| | 32/9 | (P&P - 7 Minggu) | Isnin, 22.05.2023 - Ahad, 28.05.2023 | |
| | 33/10 | | Isnin, 29.05.2023 - Ahad, 04.06.2023 | 30 & 31.05.2023, Selasa & Rabu - Pesta Kaamatan (Sabah) 01 & 02.06.2023, Rabu & Khamis - Hari Gawai (Sarawak) |
| | 34/11 | | Isnin, 05.06.2023 - Ahad, 11.06.2023 | 05.06.2023, Isnin - Hari Keputeraan YDP Agong |
| | 35/12 | | Isnin, 12.06.2023 - Ahad, 18.06.2023 | |
| | 36/13 | | Isnin, 19.06.2023 - Ahad, 25.06.2023 | |
| | 37/14 | | Isnin, 26.06.2023 - Ahad, 02.07.2023 | 28 & 29.06.2023, Rabu & Khamis - Hari Raya Haji** |
| | 38/15 | | Isnin, 03.07.2023 - Ahad, 09.07.2023 | 07.07.2023, Jumaat - Hari Bandar Warisan Dunia Georgetown 08.07.2023, Sabtu - Hari Jadi Yang di-Pertua Negeri Pulau Pinang |
| 39/16 | Minggu Ulang Kaji (1 Minggu) | Isnin, 10.07.2023 - Ahad, 16.07.2023 | | |
| 40/17 | ***Peperiksaan (2 Minggu) | Isnin, 17.07.2023 - Ahad, 23.07.2023 | 19.07.2023, Rabu - Awal Muharram | |
| 41/18 | | Peperiksaan (3 Minggu) | Isnin, 24.07.2023 - Ahad, 30.07.2023 | |
| 42/19 | | | Isnin, 31.07.2023 - Ahad, 06.08.2023 | |
| 43/20 | Cuti Panjang / Latihan Industri (10/11 Minggu) | Isnin, 07.08.2023 - Ahad, 13.08.2023 | | |
| 44/21 | | Isnin, 14.08.2023 - Ahad, 20.08.2023 | | |
| 45/22 | | Isnin, 21.08.2023 - Ahad, 27.08.2023 | | |
| 46/23 | | Isnin, 28.08.2023 - Ahad, 03.09.2023 | 31.08.2023, Rabu - Hari Kebangsaan | |
| 47/24 | | *P&P | Isnin, 04.09.2023 - Ahad, 10.09.2023 | |
| 48/25 | | Isnin, 11.09.2023 - Ahad, 17.09.2023 | 16.09.2023, Jumaat - Hari Malaysia | |
| 49/26 | | Peperiksaan | Isnin, 18.09.2023 - Ahad, 24.09.2023 | |
| 50/27 | | Isnin, 25.09.2023 - Ahad, 01.10.2023 | 27.09.2023, Rabu - Maulidur Rasul | |
| 51/28 | | Isnin, 02.10.2023 - Ahad, 08.10.2023 | | |
| 52/29 | | Isnin, 09.10.2023 - Ahad, 15.10.2023 | | |

**Kalendar Akademik adalah tertakluk kepada pindaan (sekiranya ada)

PROGRAMME SCHEDULE

| SEMESTER | DURATION |
|--|--|
| Semester I | 17 October 2022 – 26 March 2023 |
| Modules taught: TMT 501: Environmental and Occupational Toxicology TMR 504: Research and Professional Skills TMT 510: Clerkship (Poison Control) TMT 520: Research | 17 October 2022 – 29 January 2023 |
| Revision | 30 January 2023 – 5 February 2023 |
| Semester Exam | 6 February 2023 – 26 February 2023 |
| Mid Semester Break | 27 February 2023 - 26 March 2023 |
| Semester II | 27 March 2023 – 6 August 2023 |
| Modules taught: TMT 505: Clinical Toxicology TMT 506: Concepts in Management of Hazmat Incidences TMT 511: Clerkship (Clinical Toxicology) TMT520: Research | 27 March 2023 – 9 July 2023 |
| Revision | 10 July 2023 - 16 July 2023 |
| Semester Exam | 17 July 2023 – 6 August 2023 |
| Long Vacation Course (KSCP) /Semester III | 7 August 2023 – 15 October 2023 |
| TMT520: Research Submission of Dissertation Viva voce | 7 August 2023 - 15 October 2023 |

PROGRAMME STRUCTURE / COURSE REGISTRATION

| Description | Code | Module (Course) | Course Type | Unit |
|------------------------------------|---------|---|-------------|-----------|
| Semester I | | | | |
| Lecture/practical | TMT 501 | Environmental and Occupational Toxicology | Core | 4 |
| | TMR 504 | Research and professional skills | Core | 3 |
| | TMT 510 | Clerkship (Poison Control) | Core | 3 |
| Research | TMT 520 | Research | Core | 20 |
| Total unit to register | | | | 30 |
| Semester II | | | | |
| Lecture/practical | TMT 505 | Clinical Toxicology | Core | 3 |
| | TMT 506 | Concepts in Management of Hazmat Incidences | Core | 4 |
| | TMT 511 | Clerkship (Clinical Toxicology) | Core | 3 |
| Research | TMT 520 | Research (auto register) | Core | - |
| Total unit to register | | | | 10 |
| Long Vacation Course (KSCP) | | | | |
| Research | TMT 520 | Research (auto register) | Core | - |
| Total Unit | | | | 40 |

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MODULES/COURSE COORDINATORS

| SEMESTER I | | |
|--|-------------|-----------------------------|
| MODULE/COURSE | UNIT | COORDINATORS |
| TMT 501 Environmental and Occupational Toxicology | 4 | Dr. Nurhuda Mohamad Ansor |
| TMR 504 Research and Professional Skills | 3 | Dr. Rafidah Zainon |
| TMT 510 Clerkship (Poison Control) | 3 | Dr. Nur Azzalia Kamaruzaman |
| TMT 520 Research | 20 | Dr. Eshaifol Azam Omar |
| SEMESTER II | | |
| MODULE/COURSE | UNIT | COORDINATORS |
| TMT 505 Clinical Toxicology | 3 | Dr. Mohd Yusmaidie Aziz |
| TMT 506 Concepts in Management of Hazmat Incidences | 4 | Dr. Maisarah Nasution Waras |
| TMT 511 Clerkship (Clinical Toxicology) | 3 | Dr. Nurul Shahfiza Noor |
| TMT 520 Research | | Dr. Eshaifol Azam Omar |
| LONG VACATION COURSE / SEMESTER III | | |
| MODULE | UNIT | MODULE COORDINATORS |
| TMT 520 Research | | Dr. Eshaifol Azam Omar |

MODULE SYNOPSES

TMT 501: ENVIRONMENTAL AND OCCUPATIONAL TOXICOLOGY

LEARNING OUTCOMES

At the end of this course, the candidates will be able to:

1. Identify the effects on human being following exposures to hazardous chemicals from environmental and occupational related activities.
2. Provide appropriate measures for assessment and monitoring of the affected victims.

SYNOPSIS

This module will discuss the historical review of human impact on the environment, effects of pollutants on ecosystems, environmental toxicity testing, environmental monitoring, risk assessment (acute, subacute and chronic testing, mutagenicity assays and reproductive toxicity tests). Aspects of local legislations and international conventions that have been developed will also be discussed. This section will also describe the evaluation of occupational exposures and the toxic effects, physical properties and workplace exposure limits. The objectives will be covered in the form of lectures, tutorials and laboratory testing (including animal models).

TOPICS

| | Topics (4 units) | Hours |
|-------|--|-------|
| 1. | Environmental Toxicology | |
| 1.1 | Introduction and definition | 1 h |
| 1.2 | Source of chemicals in the environment (natural and human cause) | |
| 1.2.1 | Plant toxin | 1h |
| 1.2.2 | Animal/insect toxin | 2h |
| 1.2.3 | Marine life toxin | |
| 1.2.4 | Air and water pollutants | 1h |
| 1.3 | Route of exposure | 1h |
| 1.4 | Adverse effects on humans | 1h |
| 1.5 | Environment risk assessment on health | 1h |
| 1.6 | Treatment and antidotes | 1h |
| 1.7 | Environmental effects of chemicals | 5h |
| 1.7.1 | Introduction | |
| 1.7.2 | Effects on aquatic environment | |

| | | |
|-------|---|----|
| 1.7.3 | Effects on freshwater ecosystem | |
| 1.7.4 | Effects on terrestrial ecosystem | |
| 1.7.5 | Others: acid rain, greenhouse effect, ozone depletion | |
| 1.8 | Legislation | 2h |
| 1.8.1 | Local legislation | |
| 1.8.2 | International convention | |
| 1.9 | Case study 1 | 3h |
| 1.9.1 | Case study 2 | 3h |
| 2 | Occupational Toxicology | |
| 2.1 | Introduction & definition | 3h |
| 2.2 | Source of toxicant from the activities at the workplace | |
| 2.2.1 | Industry | |
| 2.2.2 | Agriculture | |
| 2.2.3 | Construction | 3h |
| 2.2.4 | Radioactive | |
| 2.2.5 | Laboratories | 1h |
| 2.3 | Route of exposure | 1h |
| 2.4 | Adverse effects on human | 1h |
| 2.5 | Assessing human health risk of chemical exposure | 1h |
| 2.6 | Emergency medical response to hazardous materials and incidents | |
| 2.6.1 | General considerations | 6h |
| 2.6.2 | Coordination | |
| 2.6.3 | Assessment of hazard potential | |
| 2.6.4 | Victim management | |
| 2.6.5 | Contingency plan | |
| 2.7 | Evaluation of the patient with chemical exposure at the workplace | 3h |
| 2.7.1 | Exposure history | |
| 2.7.2 | Examples of the occupational toxidromes | |
| 2.7.3 | Laboratory visit and testing | 1h |
| 2.7.4 | Treatment | 1h |
| 2.7.5 | Antidotes | 1h |
| 2.7.6 | Legal and administrative components | 1h |
| 2.7.7 | Case study 3 | 3h |

| | | |
|-------|--|-----|
| 2.7.8 | Case study 4 | 3h |
| 2.8 | Preventive measures in environmental and occupational toxicology (primary, secondary and tertiary) | 2h |
| | Total hours | 56h |

REFERENCES

1. Flomenbaum N. E. [et al.] Goldfrank's Toxicologic Emergencies. McGraw-Hill Professional. Latest edition: 2006 (Available at IPPT, In Order, ISBN:9780071437639).
2. Greenberg, M. [et al.] Occupational, Industrial, and Environmental Toxicology. Mosby. Edisi terbaru: 2003 (Available at Health campus/IPPT - In Order, ISBN:9780815139294).
3. Harbison R.D. Hamilton & Hardy's Industrial Toxicology. Mosby. Latest edition: 5th edition, 1998 (Available at IPPT, In Order, ISBN:9780815141815).
4. Lewis R.J. Rapid Guide to Hazardous Chemicals in the Workplace. John Wiley & Sons. Latest edition: 2000 (Available at Transkrian / IPPT, In Order, ISBN:9780471355427).
5. Ladou J. Current Occupational & Environmental Medicine. McGraw-Hill Medical. Latest edition: 2006 (Available at IPPT, In Order, ISBN:9780071443135).
6. Ming-Ho, Y. and Landis W. G. Introduction to Environmental Toxicology: Impacts of Chemicals upon Ecological Systems. CRC. Latest edition: 2003 (Available at Transkrian /USM, ISBN:9781566706605).
7. Ming-Ho, Y. Environmental Toxicology: Biological and Health Effects of Pollutants. Taylor and Francis. Latest edition: 2004 (Available at IPPT, In Orders ISBN:9781566706704).
8. Occupational Safety and Health Act 1994: Regulations & Orders (as at 25th June 2004). International Law Book Series Latest edition: 2007 (To order).
9. Pohanish P.R. and Greene S.A. Hazardous Chemical Safety Guide for the Machining and Metalworking Industries. McGraw Hill. Latest edition: Nov 1998 (Available at IPPT – In Order, ISBN:9780070504998).
10. Rosenstock L. [et al.] Textbook of Clinical Occupational and Environmental Medicine. Saunders. Latest editions: 2004 (Available at IPPT, In Order, ISBN:9780721689746).

JOURNALS

1. Journal of Toxicology and Environmental Health. Taylor and Francis.
2. Journal of Occupational Medicine and Toxicology (London, England). BioMed Central.
3. Toxicology. Elsevier Ireland.

4. Environmental Health Perspectives. United States' National Institute of Environmental Health Sciences.
5. Environmental Toxicology. Wiley Periodicals.

DATABASE AND WEBSITES

1. Toxnet: Toxicology Data Network. National Library of Medicine
2. Tox Town. National Library of Medicine
3. Patty's Toxicology. John Wiley & Sons.
4. Enviro-HealthLinks
(<http://sis.nlm.nih.gov/enviro/envirohealthlinks.html>)
5. Toxicology Tutorials. (<http://sis.nlm.nih.gov/enviro/toxtutor.html>)
6. National Institute for Occupational Safety and Health (NIOSH).
(<http://www.cdc.gov/niosh/about.html>)
7. International Programme on Chemical Safety (IPCS). World Health Organization.
(<http://www.who.int/ipcs/en/>).

TMR 504: PROFESIONAL AND RESEARCH SKILLS

LEARNING OUTCOMES

At the end of this course, the candidates will be able to:

1. acquire communication skills and able to prepare and present papers using the latest information technology and communication methods.
2. identify various organisations that provide local and foreign research grants as they will be provided guidance in the fundamentals of research methodologies including statistical requirements and the use of statistical software for data analysis.
3. understand the importance for Informatics Science, specifically related to Bioinformatics, Clinical Informatics as well as Laboratory Information Systems.

SYNOPSIS

This course will commence with an introduction to medical research and general skills essential for a researcher. This course comprises of lectures, laboratory/studio internship, presentations and coursework.

| Topic | Contact hour/s | Objective |
|---------------------------------|----------------|---|
| Introduction | 1 | To give a general overview of the course. |
| Introduction to Research I & II | 2 | To give a general overview of the following topics: <ul style="list-style-type: none">▪ Introduction to library research.▪ Information retrieval using eLibrary system.▪ Introduction to the use of Endnote program. |
| | 3 | To give a general overview of the following topics: <ul style="list-style-type: none">▪ Research ethics and responsibility.▪ Ethics of human research.▪ Research types: Epidemiology and community base. |
| | 2 | To give a general overview of the ethics in animal research. |
| | 2 | To give a general overview of the other types of research. |
| | 1 | To give a general overview of the following topics: <ul style="list-style-type: none">▪ Research structures of USM and Malaysia.▪ Agencies sponsoring research in Malaysia.▪ Research proposal.▪ Electronic research proposal. |

| | | |
|--|----|--|
| Introduction to Research Management Skill | 1 | To give a general overview of the following topics: <ul style="list-style-type: none"> ▪ Management of research account. ▪ Purchasing procedures ▪ Management of research equipment. |
| Introduction to Multimedia Skill | 3 | To cover the following topics: <ul style="list-style-type: none"> ▪ Production of multimedia materials. ▪ Use of multimedia in teaching. ▪ Use of multimedia in preparation of presentation and publication materials. ▪ Visit multimedia laboratory at PTPM. |
| Communication skills | 5 | To cover the following topics: <ul style="list-style-type: none"> ▪ Art of presentation. ▪ Public speaking skill. ▪ Preparing for oral examination. ▪ Group communication skills. |
| Organizational Psychology | 3 | To cover the following topics: <ul style="list-style-type: none"> ▪ Psychology of working in a group. ▪ Leader and subordinate relationships. ▪ Emotional intelligence. ▪ Interpersonal relationship. <p>Quiz/Assignment</p> |
| Statistical Skill I & II | 14 | To give a general overview of the following topics: <ul style="list-style-type: none"> ▪ Introduction to medical statistics and research methodology. ▪ Calculation of sample size. ▪ Statistical requirement in research proposal. ▪ Statistical analysis of experimental results. ▪ Use of mathematical software in statistical analysis. |
| Bioinformatics | 3 | To give a general overview of the following topics: <ul style="list-style-type: none"> ▪ Introduction to bioinformatics. ▪ Bioinformatics research facility at USM. ▪ Use of bioinformatics tools for drug design. |
| Creativity & Innovation and Research & Society | 2 | To give a general overview of the following topics: <ul style="list-style-type: none"> ▪ Individual and milieus in fostering research creativity. ▪ National strategies for driving the creativity agenda. ▪ Role of science and technology for innovation and sustainable growth. ▪ Role of research in the development of society. |
| Introduction to Scientific Writing | 4 | To cover the topic of art in scientific writing. <p>Quiz/Assignment</p> |

REFERENCES

1. Bell, J. and Opise, C. (ed) Learning from Research: Getting more from your data. Open University Press. Latest edition: 2002 (Available at IPPT, ISBN:9780335206605).
2. Bland, M. (ed) An Introduction to Medical Statistics. Oxford University Press. Latest edition: 2000 (Available at IPPT, ISBN:9780192632692).
3. Claverie (ed) Bioinformatic for Dummies. John Wiley & Son Inc. Latest edition: 2006 (Available at IPPT).
4. Horris, C. (ed) Networking for Success: The NLP Approach to a Key Business and Social Skill. Oak Tree Press. Latest edition: 2000 (to order)
5. Horwood, T. (ed) Freelance Proofreading and Copy Editing: A Guide. Action Print Press. Latest edition: 1995 (Available at PPT).
6. Khosrow-pour, M. (ed) Web-based Instructional Learning. McGraw-Hill. Latest edition: 2002 (Available at IPPT).
7. Lest, A.M. (ed) Introduction to Bioinformatics. Oxford University Press . Latest edition: 2008 (to order)
8. Murrel, G. [et al] (ed) Research in Medicine: Planning a project, writing a thesis. Cambridge University Press. Latest edition: 1999 (Available at IPPT).
9. Pallant, J. (ed) SPSS Survival Manual: A Step-by-Step Guide to Data Analysis Using SPSS for Windows (Version 10). Open University Press. Latest edition: 2001 (Available at IPPT, ISBN:9780335208906).
10. Parry, H. (ed) Successful Business Presentation. Croner Publishing. Latest edition: 1994 (Available at IPPT – In order).
11. Pickering, P. (ed) How to make the most of your workday. Careean Press Incorporated. Latest edition: 2001 (Available at IPPT, ISBN:9781564145369).
12. Rahman, S. (Eds) Multimedia Networking Technology, Management and Applications. Idea Group Publishing. Latest edition: 2001 (Available at IPPT- In order).
13. Rotondo, J. and Rotondo, M. (eds) Presentation skills for managers. McGraw Hill. Lates edition: 2001 (Available at IPPT – In order).
14. Spank, S. and Templeton, M. (eds) Quick guide to great presentation skills. McGraw Hill. Latest edition:1998 (to order).
15. Turabian, K.L (ed) A Manual for Writers of Term Papers, Theses and Dissertations. University of Chicago Press. Latest edition: 1996 (Available at IPPT – In order).
16. Zelazny, G. (ed) Say it with presentations: How to design and deliver successful business presentations. McGraw-Hill. Latest edition: 1999 (Available at IPPT, ISBN:9780071354073).

JOURNALS

1. BMC Medical Education Journal.
2. Medical Teacher (Published in collaboration with The Association for Medical Education in Europe by Informa Healthcare)
3. New England Journal of Medicine.

TMT 510: CLERKSHIP (POISON CONTROL)

LEARNING OUTCOMES

At the end of this clerkship, the candidates will be able to

1. Understand the fundamental and advanced principles of poison control centre scope of work and activities
2. Demonstrate a level of professional skills in interpreting toxicological data and reviewing chemical risk assessment reports.

SYNOPSIS

Candidates are required to follow a structured programme in poison control activities. Students will be supervised by staff of the National Poison Centre. Active participation of the students in the poison centre activities is important and will be evaluated by a supervisor. The duration of this clerkship is 4 weeks. This course will provide relevant managerial and professional skills in the setup of poison control centre. It will cover the various aspects of infrastructure needs, recruitment of manpower, capacity building and communication skills. Aspects of laboratory and analytical works will also be emphasized.

TOPICS

The clerkship will consist of the following components and will take 4 weeks (3 credit units) to complete

1. Training in administrative set up of Poison/Drug Information Service
 - 1.1 Introduction to the Poison Centre and Drug Information Service
 - 1.2 Mission and objectives
 - 1.3 Nature of services
 - 1.4 Organization of poison centers
2. Training in utilization of Poison/Drug Information Resources
 - 2.1 General references sources
 - 2.2 Computerized systems
 - 2.3 Internet poison databases

3. Systematic Literature Search and Evaluation
 - 3.1 Search strategies
 - 3.2 Primary, secondary and tertiary references
 - 3.3 Research design
 - 3.4 Statistical significance and clinical significance
 - 3.5 Flaws of clinical studies
 - 3.6 Step by step approach in evaluating journal articles

4. Handling poison/drug information enquiries via telephone and electronic communications (national and international bodies)
 - 4.1 History taking
 - 4.2 Retrieval of necessary toxicology and drug information
 - 4.3 Assessing severity of exposure
 - 4.4 Provide appropriate therapeutic recommendations
 - 4.5 Provide written summary of the problem and related factors

5. Education and Prevention Programme
 - 5.1 Content preparation for educational materials
 - 5.2 Application of ICT and multimedia in the development of educational materials
 - 5.3 Community programme (talk, exhibition, quitline)
 - 5.4 Communication barriers and techniques

6. Attachment at Toxicology Laboratory
 - 6.1 Analytical techniques in toxicology
 - 6.2 Interpretation of results, pharmacokinetic and metabolism of poison
 - 6.3 Hands-on training in handling analytical instruments

REFERENCES

1. Anthony C Moffat [et al] Clarke's Analysis of Drugs and Poisons. Pharmaceutical Press. Latest edition: 2004 (Available at IPPT – In order).
2. Casaret and Doull's Toxicology. The Basic Science of Poison, McGraw-Hill. Latest edition: 2001 (Available at IPPT – In order, ISBN:9780071347211).
3. Kent R. Olson, Poisoning & Drug Overdose. Prentice -Hall International. Latest edition: 2006 (to order).
4. Richard C. Dart, Medical Toxicology Vol I. Lippincott Williams & Wilkins. Latest edition: 2003 (Available at IPPT, ISBN:9780781728454).
5. Sue Jickells [et al] Clarke's Analytical Toxicology. Pharmaceutical Press. Latest edition: 2008 (to order).

JOURNALS

1. The Pharmaceutical Journal.
2. Journal of Analytical Toxicology.

TMT 520: RESEARCH

LEARNING OUTCOMES

At the end of the research activity, students shall be able to:

1. Conduct scientific research related to health toxicology
2. Write dissertation and publishable scientific papers
3. Present research findings in scientific meetings

SYNOPSIS

Candidates are required to carry out research project that is intended to address an issue pertaining to the field of health toxicology. This research maybe in the form of an epidemiologic research, experimental toxicology, survey, developmental of analytical methods for identification and quantifications of poisons as well as an evaluation on the efficacy of any prevention programme or treatment of poisoning.

TOPICS

Topics related to health and/or medical toxicology

REFERENCES

In accordance to "Guide To The Preparation Of Dissertation For Master Of Scientific Programme, Universiti Sains Malaysia"

1. Barras, R. (ed) Scientists must write: A guide to better writing from scientists, engineers & students. Chapman & Hull. Latest edition: 2002 (Available at IPPT – In order, ISBN:978-0415269964).
2. Blaxter [et al] (eds) How to research. Open University Press. Latest edition: 2006 (Available at IPPT – In order).
3. Bolker, J. (ed) Writing your dissertation in fifteen minutes a day. Owl Books. Latest edition: 1998 (Available at IPPT – In order).
4. Dawson and Trapp. Basic and clinical biostatistics. Lange Publisher. Latest edition: 2004 (Available at IPPT – In order).
5. Delamont, S., Atkinson, P. and Odette, P. (eds) Survival & success in graduate school: Disciplines, disciples & the doctorate. Farmer Press, Limited (UK). Latest edition: 1999 (Available at IPPT – In order).
6. Dunleary, P (ed) Authoring a PhD: How to plan, draft, write and finish a doctoral thesis on dissertation. Palgrave MacMillan. Latest edition: 2003 (Available at IPPT – In order).

7. Jennie Manke Kahndike. Toxicology in Health Science and Medicine: Research reference analysis with bibliography. Abbe Pub Assn of Washington DC. Latest edition: 1985 (Available at IPPT – In order).
8. Locke (ed) Proposals that work. Sage Publications. Latest edition: 2007 (Available at IPPT – In order).
9. Madsen, D. (ed) Successful dissertations and theses: A guide to graduate student research from proposal to completion. Jessey Bass Wiley. Latest edition: 1991 (Available at IPPT – In order).
10. Phillips, E.M. and Pugh, D.S. (eds) How to get a PhD. A handbook for students and their supervisors. Open University Press. Edisi terbaru: 2005 (to order).
11. Silverman, D (ed). Doing qualitative research: A practical handbook. Sage Publications. Latest edition: 2004 (to order).

JOURNALS

1. Pharmaceutical Research (Official Journal of the American Association of Pharmaceutical Scientists)
2. Journal of Medical Toxicology (The official print journal of the American College of Medical Toxicology)
3. Clinical Toxicology (The American Academy of Clinical Toxicology, the European Association of Poisons Centres and Clinical Toxicologists and the American Association of Poison Control Centers)

TMT 505: CLINICAL TOXICOLOGY

LEARNING OUTCOMES

To course is designed to provide relevant information and enhance student's knowledge about the principle clinical manifestations and medical management of poisoning cases of the various substances. At the end of this course, the students are expected to be able to:

1. Acquire knowledge about drug toxicity and poisoning including pathophysiology, toxic dose and level, clinical presentation, diagnosis, and specific management associated with each substance.
2. Acquire knowledge about the proper decontamination procedure after toxicological exposure.
3. Gain knowledge about the antidotes including their pharmacology, indications, adverse effects, drug interactions, dosage and formulation
4. Give advice on assessment and management of poisoning related events and drugs toxicity which include decontaminations, sample collections and antidotes.

SYNOPSIS

During the course, students are taught about the aspects of pathophysiology, toxic dose and level, clinical presentation, diagnosis and specific treatment associated with a wide range of products which include drugs, pesticides, heavy metals, household & industrial chemicals that are commonly associated with poisoning.

| | Topic | Hours |
|-----|--|-------|
| 1. | Introduction: Definition and classifications of common drugs and poisons (Selected examples) | 2h |
| 1.1 | Drugs: Paracetamol, salicylates, NSAIDS, Drugs of abuse, steroids | |
| 1.2 | Traditional products Adulterated traditional medicines (e.g, steroids, slimming agents, sildenafil) | 2h |
| 1.3 | Pesticides Herbicides, insecticides, rodenticides | 2h |
| 1.4 | Heavy metals Lead, mercury, cadmium, arsenic | 2h |
| 1.5 | Household and industrial chemicals Ammonia, sulfuric acid Acid, alkali, bleach, soap, detergent Cosmetics Petrochemical products | 2h |

| | | |
|-----|---|-----|
| | Solvents | |
| 2 | Pathophysiology and pharmacology including: | |
| 2.1 | Mechanisms of poisoning | 5h |
| 2.2 | Toxicokinetics | |
| 2.3 | Chronic toxicity testing | |
| 3. | Clinical effects (onset, duration, affected organs) | |
| 3.1 | Gastrointestinal | 1h |
| 3.2 | Kidney | |
| 3.3 | Liver | |
| 3.4 | Respiratory system | 2h |
| 3.5 | Nervous system | |
| 3.6 | Immune system | |
| 3.7 | Reproductive system and teratogenicity | 3h |
| 3.8 | Carcinogenicity and mutagenicity | |
| 4. | Investigations of poisoning | |
| 4.1 | Types of samples to be collected | 2h |
| 4.2 | Time of sample collection | |
| 4.3 | Type of tests to be done | |
| 5 | Treatment and monitoring | |
| 5.1 | Decontaminations | 2h |
| 5.2 | Antidotes | |
| 5.3 | Symptomatic and supportive | |
| 5.4 | Monitoring parameters | |
| 6. | Case study | 5h |
| | Total hours | |
| | 1 credit unit = 10 – 12 contact hours | 30h |
| | 3 credit unit = 30 – 36 contact hours | |

REFERENCES

1. Alison L. J. And Paul I. D. Churchill's Pocket Book of Toxicology. Churchill Livingstone. Lates edition: 2001 (Available at IPPT – In order, ISBN:0443064768).
2. Bryson P.D. Comprehensive Review in Toxicology for Emergency Clinicians. Taylor & Francis. Latest edition: 1996 (Available at IPPT – In order).

3. Diagnostic Criteria And Early Management of Pesticide Poisoning, Occupational Health Unit, Disease Control Division, Ministry of Health, Malaysia. Latest edition: 2003 (to order).
4. Dreisbach R.H., True B.L., Dreisbach's Handbook of Poisoning, prevention, diagnosis and treatment. The Parthenon Publishing Group. Latest edition: 2001: (Available at IPPT – In order).
5. Ellenhorn M. Ellenhorn's Medical Toxicology. New York: Elsevier. Latest edition: 1997 (Available at IPPT – In order).
6. Goldfrank LR [et al] Goldfrank's Toxicologic Emergencies. McGraw Hill. Latest edition: 2006 (to order).
7. Kent R. Olson. Poisoning & Drug Overdose; Clinical manual. McGraw Hill. Latest edition: 2006 (Available at IPPT – In order).
8. Klaassen C.D. [et al], Casaret and Doull's Toxicology, The Basic Science of Poison. McGraw-Hill. Latest edition: 2001 (to order).
9. Micheal I. Greenberg [et al] Medical Toxicology Review. McGraw Hill. Latest edition: 2005 (to order).
10. Pesticides Act 1974 (Act 149). International Law Book Series. Lates edition: 2007 (to order).
11. Seth Schonwald. Medical Toxicology: A Synopsis and Study Guide, Lippincott Williams & Wilkins. Latest edition: 2001 (Available at IPPT – In order).
12. Tomlin C.D.S. The Pesticide Manual. British Crop Protection Council. Latest edition: 1979 (Available at IPPT – In order).

JOURNALS

1. American Academy of Clinical Toxicology.
2. The International Journal of Toxicology.
3. Journal of Applied Toxicology.

TMT 506: CONCEPTS IN THE MANAGEMENT OF HAZMAT INCIDENTENCES

LEARNING OUTCOME

At the end of this course, the candidates will be able to:

1. Acquire knowledge regarding the medical management (basic and advanced) of the common hazardous material (Hazmat) exposures.

SYNOPSIS

This module is designed to provide knowledge regarding the medical management of the common material exposures. The module covers the general principles of Hazmat management, epidemiology, important properties of hazardous materials, medical management of Hazmat victims, personnel protective equipment and decontamination, toxidromes and toxicodynamics, antidotes, and establishing and organising Hazmat Response Team. Toxic Inhalants, pesticide poisoning, toxic terrorism, corrosives and solvents will be covered.

| No | Topics (4 credit unit) | Hours |
|-------|---|-------|
| 1. | Hazardous materials (Hazmat) | |
| 1.1 | Epidemiology | 2h |
| 1.2 | International Hazard Classification Systems (IHCS) | 2h |
| 1.3 | Important properties of hazardous materials | |
| 1.3.1 | Chemical names and numbers | |
| 1.3.2 | Physical and chemical properties | |
| 2. | Medical management of Hazmat victims | 6h |
| 2.1 | Hazmat incidents Command Systems | |
| 2.1.1 | Mass casualty incidents | |
| 2.1.2 | Disaster | |
| 2.2 | Management of victims | |
| 3. | Preventive measures in Hazmat (primary, secondary and tertiary) | 2h |
| 4. | Personnel protective equipment and decontamination | 2h |
| 5. | Toxidromes, toxicodynamics and toxicokinetics | 4h |
| 6 | Antidotes | 3h |
| 6.1 | Definition | |
| 6.2 | Recognition of common antidotes | |
| 6.3 | Pharmacological properties | |

| | | |
|------|---|-----|
| 7. | Establishing and organising a Hazmat Response Team | 3h |
| 7.1 | Rules and standards | |
| 7.2 | Needs assessment | |
| 7.3 | Hazmat response team composition | |
| 7.4 | Developing of Standard Operating Procedures (SOPs) | |
| 8. | Toxic inhalants and antidotes | 2h |
| 8.1 | Water soluble gases | |
| 8.2 | Asphyxiants | |
| 9. | Pesticides and antidotes for: | 2h |
| 9.1 | Organophosphate and carbamate | |
| 9.2 | Pyrethrin and pyrethroids | |
| 9.3 | Herbicides | |
| 10. | Toxic Terrorism and antidotes | 4h |
| 10.1 | Nuclear terrorism | |
| 10.2 | Biological terrorism | |
| 10.3 | Chemical terrorism | |
| 11 | Case study 1 | 4h |
| 12 | Case study 2 | 4h |
| | Total hours 1 credit unit = 10 – 12 contact hours 4 credit unit = 40 – 48 contact hours | 40h |

REFERENCES

1. Advanced Hazmat Life Support (AHLS) Instructor Manual. Univ. Arizona Emergency Medicine Research Center and American Academy of Clinical Toxicology.
2. Alan, B J. HazMat Emergency Response Manual. One-Off Books. Latest edition: 2006 (Available at IPPT – In order).
3. Bevelacqua A. S. Hazardous Materials Chemistry. Thomson Delmar Learning. Latest edition: 2005 (Available at IPPT – In order).
4. Hawley C. D. Hazardous Materials Incidents. Thomson Delmar Learning. Lates edition: 2007 (Available at IPPT – In order).
5. Henry T .V. Decontamination for Hazardous Materials Emergencies. Thomson Delmar Learning. Latest edition: 1998 (Available at IPPT – In order).

6. Inc. Mangan Communications. 49 CFR Hazardous Materials Regulations (HAZMAT). Mangan Communications Inc. Latest edition: 2005 (Available at IPPT – In order).
7. Leonard J E. Managing Hazardous Materials. Institute of Hazardous Materials Management. Latest edition : 2002 (Available at IPPT – In order).
8. Oldfield K. W. [et al.] Emergency Responder Training Manual for the Hazardous Materials Technician. Wiley-Interscience. Latest edition: 2004 (Available at IPPT – In order).
9. Pohanish R. P. HazMat Data: For First Response, Transportation, Storage, and Security. John Wiley & Sons. Latest edition: 2004 (Available at IPPT – In order).
10. Shafer D. A. Hazardous Materials Characterization. John Wiley & Sons. Latest edition: 2005 (Available at IPPT – In order).

JOURNALS

1. Journal of Hazardous Materials.
2. Emergency Medical Services.

DATABASE AND WEBSITES

1. Office of hazardous materials safety
(<http://hazmat.dot.gov/>).
2. NICAR: Hazardous Materials
(<http://www.ire.org/datalibrary/databases/viewdatabase.php?dbaseindex=13>).
3. HazDat. Agency for Toxic Substances and Disease Registry. (<http://www.atsdr.cdc.gov/hazdat.html>).

TMT 511: CLERKSHIP (CLINICAL TOXICOLOGY)

LEARNING OUTCOMES

After completing this clerkship the students are expected to be able to:

1. Recognize the clinical features of common poisoning in human
2. Give advice on how to investigate common poisoning cases
3. Give advice on the management of common poisoning cases
4. Cooperate with other parties in managing patients with poisoning

SYNOPSIS

Students are required to follow a structured programme in selected hospitals where cases of poisoning are managed. The students will be posted to emergency departments and other departments such as medicine and paediatrics. The students will be supervised by trained medical specialists in the hospitals. The evaluation will be done by the field supervisors (medical specialists) and lectures. The duration of clerkship is 4 weeks

TOPIC

This clerkship will take 4 weeks (3 units) to complete and consists of clinical aspects of common poisonings such as:

1. Drugs
 - 1.1 Paracetamol
 - 1.2 Salicylate
 - 1.3 NSAIDs
 - 1.4 Drug and solvents of abuse
2. Pesticides
 - 2.1 Herbicides e.g. paraquat
 - 2.2 Insecticides e.g. organophosphate
 - 2.3 Rodenticides
 - 2.4 Fungicides
3. Heavy metals
 - 3.1 Lead
 - 3.2 Mercury
 - 3.3 Cadmium
 - 3.4 Arsenic
4. Household & industrial chemicals
 - 4.1 Ammonia, sulphuric acid
 - 4.2 Acid, alkali, bleaches, soaps, detergents, hydrocarbons e.g. kerosene, petrol, diesel
5. Food poisoning

6. Other common poisons

| No | Topics (4 cunits) | Hours |
|-----|---|-------|
| 1. | Drugs | |
| 1.1 | Paracetamol | 4h |
| 1.2 | Salicylates | |
| 1.3 | NSAIDs | 4h |
| 1.4 | Drugs and solvents of abuse | |
| 2. | Pesticides | 8h |
| 2.1 | Herbicides e.g. paraquat | |
| 2.2 | Insecticides e.g. organophosphate | |
| 2.3 | Rodenticides | |
| 2.4 | Fungicides | |
| 3. | Heavy metals | 8h |
| 3.1 | Lead | |
| 3.2 | Mercury | |
| 3.3 | Cadmium | |
| 3.4 | Arsenic | |
| 4. | Household & industrial chemicals | 8h |
| 4.1 | Ammonia, sulfuric acid | |
| 4.2 | Acid, alkali, bleaches, soaps, detergents | |
| 4.3 | Hydrocarbons e.g. kerosene, petrol, diesel | |
| 5. | Food poisoning | 8h |
| 6. | Other common poison | 8h |
| | Total hours 1 credit unit = 10 – 12 contact hours 4 credit unit = 40 – 48 contact hours | 48h |

REFERENCES

1. Flomenbaum, N. E. [et al.] Goldfrank's Toxicologic Emergencies. 8th ed. McGraw-Hill, Medical Pub. Division. Latest edition: 2006 (Available at IPPT/Health campus).
2. Holland J. W. A Textbook of Medical Chemistry and Toxicology. Kessinger, Publishing. Latest edition: 2007 (to order)

3. Olson, Kent R. Poisoning & Drug Overdose. Lange Medical Books/McGraw-Hill. Latest edition: 2006 (Available at Health campus).
4. Ryan R. and Terry C. Toxicology Desk Reference: The Toxic Exposure & Medical Monitoring Index. CRC. Latest edition: 1999 (Available at IPPT – In order).
5. Richard, C. D. Medical Toxicology. Lippincott Williams & Wilkins. Latest edition: 2003 (Available at IPPT/Health campus).

JOURNALS

1. Journal of Medical Toxicology (American College of Medical Toxicology)
2. Clinical Toxicology.
3. Internet Journal of Medical Toxicology (American College of Medical Toxicology).
4. Medical toxicology and adverse drug experience.
5. Journal of Applied Toxicology.

DATABASE AND WEBSITES

1. Current Protocols in Toxicology. John Wiley & Sons, Inc (Subscribed database).

EVALUATION FORMAT

There are two components for the M.Sc (Health Toxicology) program:

1. The formal taught courses accounting for 20 units.
2. The research dissertation accounting for 20 units.

| SUMMARY OF ACQUIRED UNITS | |
|---------------------------|-----------|
| Semester I | 10 |
| Semester II | 10 |
| Research (TMT520) | 20 |
| Total | 40 |

ASSESSMENT OF THE FORMAL TAUGHT COURSES

The formal taught courses will be graded and recorded as Grade Point Average (GPA) and the final GPA over the two semesters will be recorded as cumulative GPA (CGPA). The marking of the answer scripts will be based on the standard mark from 0 % to 100 % for a perfect answer. This mark will be converted to the GPA based on the following system:

| Mark (%) | Grade | Grade Point | Result |
|----------|-------|-------------|-------------|
| 80 - 100 | A | 4.00 | PASS |
| 70 - 79 | A- | 3.67 | |
| 64 - 69 | B+ | 3.33 | |
| 58 - 63 | B | 3.00 | |
| 52 - 57 | B- | 2.67 | |
| 46 - 51 | C+ | 2.33 | |
| 40 - 45 | C | 2.00 | FAIL |
| 36 - 39 | C- | 1.67 | |
| 32 - 35 | D+ | 1.33 | |
| 28 - 31 | D | 1.00 | |
| 25 - 27 | D- | 0.67 | |
| 0 - 24 | F | 0.00 | |

For each module, continuous assessment will contribute 30% of the final mark while the end of the semester examination will contribute the other 70%. The breakdown of the marking scheme is as follows:

A. Continuous Assessment (course work)

| Break down | Marks |
|---|-----------|
| Quiz (short questions to be given randomly) | 5 |
| Assignment | 15 |
| Presentation | 20 |
| TOTAL | 40 |

B. Clerkships (TMT 510, TMT 511)

| | | |
|--------------------------------------|----|--------|
| 1 Report | 30 | } 100% |
| 1 Seminar Presentation | 20 | |
| Log Book | 30 | |
| Attendance | 10 | |
| Involvement in discussion/activities | 10 | |

C. Semester Examination

At the end of each semester, each module will have an exam paper of 3 hours long comprising:

| COMPONENTS | MARKS |
|--|-----------|
| Multiple Choice Question (MCQ, of true/false type) | 30 |
| Essay/ Short notes | 30 |
| TOTAL | 60 |

D. The Final Grade

The final grade for the module will be based on the summation of the continuous assessment (course work) and the End-of-the-Semester exam.

ASSESSMENT OF THE RESEARCH COMPONENT (TMT520 Research)

This is a partial fulfilment for the degree of MSc Health Toxicology. A candidates will be assessed as **PASS** or **FAIL** based on the reports submitted by the Program Chairman, the Main Supervisor, and the dissertation assessment reports by the internal examiner and the supervisor and viva voce.

Free consultation and AMDI Mixed Mode Dissertation template is available at AMDI Library website <https://www.amdi.usm.my/tkic-dwthesistemp>

REQUIREMENT FOR GRADUATION

In order to graduate, candidates must satisfy requirement 1 and 2 below:

Requirement 1:

- i. A CGPA of at least **3.00**.
- ii. GPA of not less than 2.33 (**C+**) for each of the formal taught courses.
- iii. Accumulated credit of **40 unit**.

Requirement 2: A **PASS** for the Research module (viva voce and dissertation) (**TMT520**).

TEACHING VENUES

1. Academic Blok, AMDI, Sains@Bertam, Kepala Batas
2. National Poison Centre, USM Main Campus
3. AMDI Laboratory at Clinical Trial Complex (CTC) and Animal Research Complex (ARC), AMDI
4. Multidisciplinary Laboratory (MDL), Sains@Bertam, Kepala Batas
5. Centre for Knowledge, Communication and Technology (PPKT) teleconferencing
6. Selected Hospital

STUDENT FACILITIES

As registered USM students, you are entitled to student facilities in AMDI or USM campus:

1. Lecture Halls and Tutorial Rooms, AMDI
2. Multimedia Room/Computer Laboratory, AMDI
3. AMDI Library, Sains@Bertam and Perpustakaan Hamzah Sendut, USM Main Campus
4. Outpatient treatment at Medical and Dental Clinic, AMDI Clinical Trial Complex (CTC) and Pusat Sejahtera (USM Main Campus Clinic)
5. Free membership of AMDI Students Association