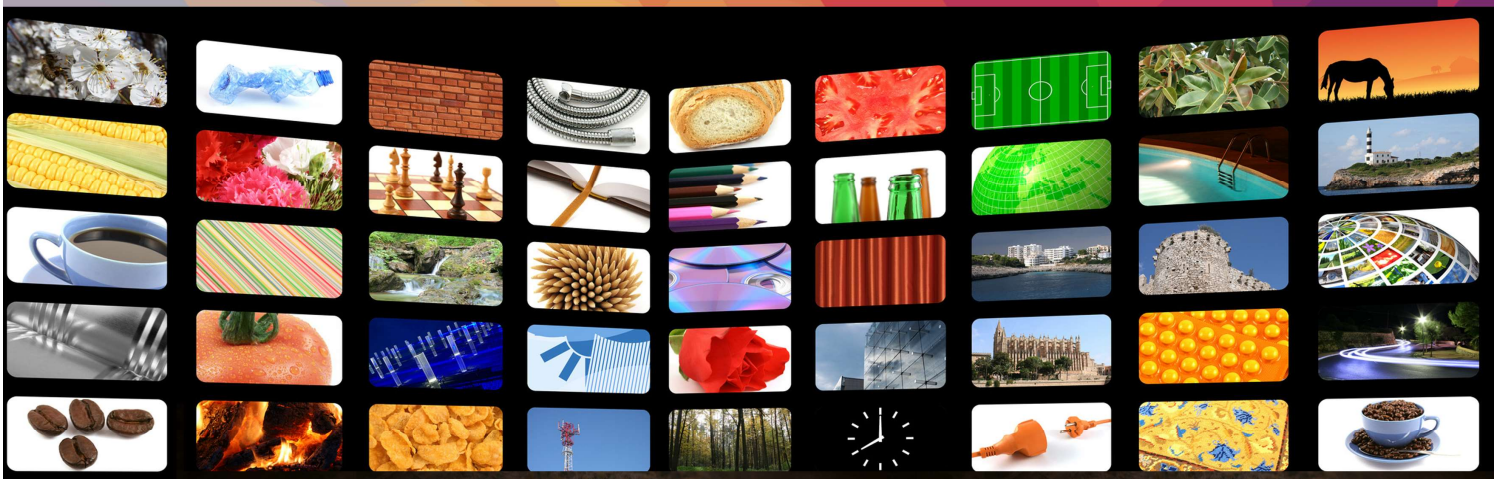
UTHM
Universiti Tun Hussein Onn Malaysia

Universiti Tun Hussein Onn Malaysia
86400 Parit Raja, Batu Pahat, Johor

Academic Proforma 2016/2017



Bachelor of Computer Science (Multimedia Computing) with Honours

Faculty of Computer Science and Information Technology

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Universiti Tun Hussein Onn Malaysia
August 2016

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Foreword from the Vice Chancellor

Assalammualaikum Warahmatullahi Wabarakatuh and Warm Grettings

Our utmost gratitude to Allah the Almighty, I am able to share and pen down a couple of words and advices to readers of this proforma especially to new students of Universiti Tun Hussein Onn Malaysia (UTHM) whom had just enrolled in this 2016/2017 Academic Session.

Congratulations and welcome to the new students and thank you for believing in UTHM for your continuing endeavour in the search of knowledge towards the success in your future career and life betterment.

For your information, University leadership continues to strive in the search of, designing, and adapting the effective and efficient approaches that would able to produce the highest impact towards making UTHM a top Higher Education Institution. The success in obtaining “QS STARS RATED FOR EXCELLENCE 2015”☆☆☆ and UTHM was recognized as the Top 300 in the QS World University Ranking by Subject 2015 for Mechanical, Aeronautical and Manufacturing Engineering, have proven that UTHM continues creating excellence. These successes have convinced the University that these are due to the alignment of University's vision and mission which are continually strengthen and improve.

As the Vice Chancellor, I gave full confidence that UTHM is currently on the right track in the effort towards the success of the 10 Shifts identified in the Malaysia Education Blueprint (Higher Education). Based on the details outlined in the Malaysia Education Blueprint (Higher Education), UTHM is committed in producing human capital and disseminating knowledge to meet the needs of the industry and the community as well as to nurture creative and innovative human capital.

Last but not least, I believe that you will become graduates of the University that will successfully continue the University excellence tradition. When you graduated, you will become the member of society that will not only be able to apply the knowledge gained but also be able to contribute service and expertise for the importance and the needs of Religion, Race and Nation.

"**WITH WISDOM WE EXPLORE**"

PROFESSOR DATUK DR. MOHD. NOH BIN DALIMIN
Vice-Chancellor
Universiti Tun Hussein Onn Malaysia

Foreword from the Deputy of Vice Chancellor (Academic and International)

Assalammualaikum Warahmatullahi Wabarakatuh and Warm Greetings

I would like to take this opportunity to express the utmost congratulations and well done to you as the new students whom have been successfully been selected to pursue studies at Universiti Tun Hussein Onn Malaysia for this 2016/2017 session.

I would also like to congratulate Centre for Academic Development and Training that has successfully produced the proforma which will be used as a guide for students in planning the studies beginning from the first semester until the end of the studies at this University.

Detailed planning which is effectively implemented at every semester as well as early preparation of students before attending lectures is very important in ensuring the readiness of learning process. Apart from that, the preparation for co-curriculum program also is important in shaping the personality and social development of students.

I hope that the publication of this proforma can be fully utilized by you in planning your studies at the University and you are capable of obtaining the best results as well as attaining excellent success.

Last but not least, I would like to wish All the Best and I pray that you will achieve excellent success in your studies at the University and thus can contribute as the human capital towards religion, race and Nation development.

Thank you.

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PROFESSOR DR. WAHID BIN RAZZALY
Deputy of Vice Chancellor (Academic and International)
Universiti Tun Hussein Onn Malaysia

Foreword from the Dean of Faculty of Computer Science and Information Technology

Assalamualaikum Warahmatullahi Wabarakatuh and Warm Greetings

First and foremost, I would like to welcome you to the Faculty of Computer Science and Information Technology (FSKTM) for current academic session of 2016/2017. My heartiest congratulation to all of you for being part of us.

With UTHM's primary mission and vision to produce creative and high quality graduates, FSKTM is offering various courses to our students. These courses are specially tailored based on findings from the market research conducted in the field of Computer Science and Information Technology. You will be exposed to learning and teaching with appropriate doses of theory and practice in the field of Computer Science and Information Technology including educational visits to IT industries and industrial attachment.

Together with the Department of Software Engineering, FSKTM has grown to include three (3) more departments, namely the Department ofInformation Security, Department of Multimedia, and Department of Web Technology. Through these four (4) departments, five (5) Bachelor programmes, four (4) Master by mix-mode programmes, Master by research programme and Doctorate of Philosophy (PhD) programmes are offered.

With the Bachelor programmes offered at FSKTM, you should take the opportunity to work exhaustively to fulfill your own goal and finally contribute to the goals of your nation and the industry. Systematic planning coupled with good preparation throughout your studies will produce good academic posture and a satisfying students' life. Aim high and work both hard and smart!

Last but not least, congratulations and all the best!

Thank you.

ASSOCIATE PROF. DR. NAZRI BIN MOHD NAWI
Dean
Faculty of Computer Science and Information Technology
Universiti Tun Hussein Onn Malaysia

University Vision

Towards a world class university in engineering, science and technology for sustainable development

University Mission

UTHM is committed to generate and disseminate knowledge, to meet the needs of industry and community and nurturing creative and innovative human capital, based on tauhidic paradigm

University Education Philosophy

The education and training in this university is a continuous effort to lead in the market oriented academic programmes. These programmes are student-focused and are conducted through experiential learning in order to produce well trained human resource and professionals who are catalysts for a sustainable development

University Logo

The logo of Universiti Tun Hussein Onn Malaysia (UTHM) is the pride, identity and idealism of the members of UTHM community. UTHM logo displays a Proton, Book, Tiered Mortar Board, Book Rest and Shield.

The whole concept of the logo symbolises UTHM as an Institution of Higher Learning which supports the growth and development of knowledge at all levels in fields of Science and Technology.

Blue represents a close-knit circle of members of UTHM community which ensures the success and enhancement of its educational and research programmes and activities for the benefits of mankind.

Red symbolises the courage of UTHM in the exploration of new fields as the pioneer in science and technology applications, which reflects the spirit and self-esteem of the members of UTHM community.

Symbolism:

Red	Courage
Blue	Co-operation/Loyalty
Silver	Quality/Prestige
Book Rest	Repository of knowledge
Proton	Science and technology
Book	Knowledge
Mortar board	Levels of study
Shield	Confidence

Chancellor

Duli Yang Maha Mulia Sultan Ibrahim Ibni Almarhum Sultan Iskandar
Sultan of Johor
D.K., D.K. (Pahang), SPMJ, SSIJ, S.M.N., S.P.M.T., S.M.P.K., P.I.S.

Pro-Chancellor I

Duli Yang Amat Mulia Tunku Ismail Ibni Sultan Ibrahim
Tunku Mahkota of Johor
D.K., SPMJ, P.I.S

Pro-Chancellor II

YBhg. Tan Sri Dr. Ali Hamsa
Chief Secretary to the Government of Malaysia

University Board of Directors

Chairman

Tan Sri (Dr.) Ir. Jamilus bin Md Hussin
Pengerusi Lembaga Pembangunan Industri Pembinaan (CIDB Malaysia),
Pengerusi KLIA Premier Holdings

Members

Professor Datuk Dr. Mohd. Noh bin Dalimin
Vice Chancellor
Universiti Tun Hussein Onn Malaysia

Tan Sri Dato' Sri Sufri bin Hj Mohd Zin
Group Managing Director
TRC Synergy Berhad

Associate Professor Dr. Arham bin Abdullah
Director
Industrial Relation Division
Ministry of Higher Education Malaysia

Datuk Dr. Pang Chau Leong
Department of Skills Development
Ministry of Human Resources

Datuk Hj. Mohlis bin Jaafar
Head of Director
Department of Polythechnic Education
Ministry of Higher Education Malaysia

Dato' Zainal Abidin bin Mat Nor
Deputy Secretary of Public Asset Management Division
Ministry of Finance

Datuk Mat Noor Nawi
Chairman
Exim Bank Berhad

Puan Mazula binti Sabudin
Director
Student Entry Management Division
Ministry of Higher Education Malaysia

Secretary

Encik Abdul Halim bin Abdul Rahman
Registrar
Universiti Tun Hussein Onn Malaysia

Senate Members

Chairman

Professor Datuk Dr. Mohd. Noh bin Dalimin
Vice-Chancellor

Members

Professor Dr. Wahid bin Razzaly
Deputy Vice-Chancellor (Academic and International)

Professor Dr. Hashim bin Saim
Deputy Vice-Chancellor (Research and Innovation)

Assiciate Professor Dr. Asri bin Selamat
Deputy Vice-Chancellor (Student Affairs and Alumni)

Professor Dr. Ahmad Tarmizi bin Abd. Karim
Assistant Vice-Chancellor (Development, Management Facility and ICT)

Profesor Dato' Dr. Abdul Razak bin Hj. Omar
Assistant Vice-Chancellor (Community and Industrial Relations)

Professor Dr. Hj. Ismail bin Abdul Rahman
Dean Centre for Graduate Studies

Associate Professor Dr. Abd Halid bin Abdullah
Dean Faculty of Civil and Environmental Engineering

Dr. Afandi bin Ahmad
Dean Faculty of Electrical and Electronic Engineering

Associate Professor Dr Shahruddin bin Mahzan @ Mohd Zin
Dean Faculty of Mechanical and Manufacturing Engineering

Dr. Mohd Lizam bin Mohd Diah
Dean Faculty of Technology Management and Business

Associate Professor Dr. Ahmad bin Esa
Dean Faculty of Technical and Vocational Education

Associate Professor Dr. Nazri bin Mohd Nawi
Dean Faculty of Computer Science and Information Technology

Associate Professor Dr. Mohd Kamarulzaki bin Mustafa
Acting Dean Faculty of Science, Technology and Human Development

Associate Professor Dr. Ishak bin Baba
Dean Faculty of Engineering Technology

Associate Professor Dr. Mohamad Zaky Bin Noh
Dean Centre for Diploma Studies

Associate Professor Dr. Azme bin Khamis
Dean Center for Academic Development and Training

Professor Dr. Rosman bin Md. Yusoff
Dean Centre for General Studies and Co-Curricular
Director Institute for Social Transformation and Regional Development

Madam Robijah binti Kamarulzaman
Dean Centre for Language Studies

Professor Dr. Rosziati binti Ibrahim
Dean Research and Development Centre

Professor Dr. Sulaiman bin Hj Hassan
Faculty of Mechanical and Manufacturing Engineering

Professor Dr. Yusri bin Yusof
Director of International office/Faculty of Mechanical and Manufacturing Engineering

Professor Dr. Maizam binti Alias
Faculty of Technical and Vocational Education

Professor Dr. Jailani bin Md. Yunos
Faculty of Technical and Vocational Education

Professor Dr. Hj. Mustafa bin Mat Deris
Faculty of Computer Science and Information Technology

Professor Dr. Rosziati binti Ibrahim
Faculty of Computer Science and Information Technology

Professor Datin Dr. Maryati binti Mohamed
Faculty of Science, Technology and Human Development

Mr. Abdul Halim bin Abdul Rahman
Secretary/Registrar

Mdm. Azizah binti Nasri
Bursary (Acting)

Mr. Haji Bharun Narosid bin Mat Zin
Chief Librarian

Faculty of Computer Science and Information Technology

Faculty Vision

To produce creative, innovative, competent and responsible Computer Sciences and Information Technology graduates through academic program that is aligned with the mission of the university

Faculty Mission

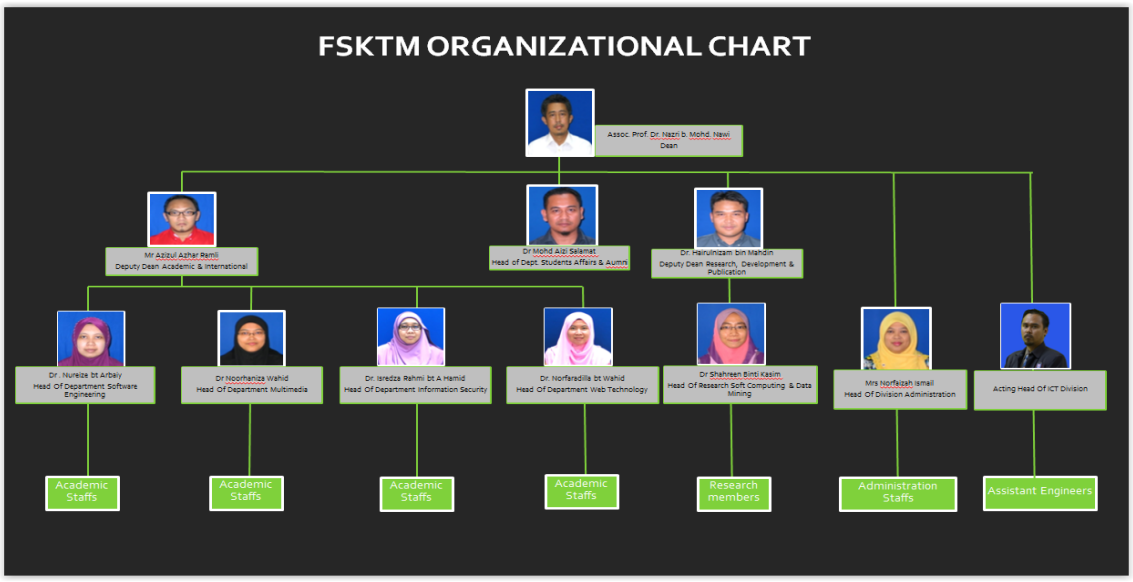
To explore Information and Communication Technology applications for the development of the nation

The establishment history of Faculty of Computer Science and Information Technology (FSKTM), Universiti Tun Hussein Onn Malaysia started in September 2000 with the establishment of the Department of Information Technology and Multimedia (JTMM), Faculty of Engineering Technology, Kolej Universiti Tun Hussein Onn (KUiTTHO). In May 2004, JTMM moves ahead with the establishment of Faculty of Information Technology and Multimedia (FTMM) which was operating at the Parit Raja City Campus, Batu Pahat, Johor.

On 24 August 2010, FTMM achieved another milestone when the UTHM Board of Directors agreed to rebrand the faculty to Faculty of Computer Science and Information Technology. Through the rebranding, four (4) new departments are established, i.e. (a) Department of Software Engineering, (b) Department of Multimedia, (c) Department of Information Security, and (d) Department of Web Technology.

The faculty offers academic programmes to students at Bachelor and Post Graduate levels. FSKTM is established with the goal to conduct programmes which have been planned to assist in the implementations towards realising the vision and mission as well as to conduct research and innovative development in accordance to the nation needs.

Apart from conducting competitive academic programme, members of FSKTM hope to create better success in the future by playing important roles in producing skilled professionals in the various field of Computer Science and Information Technology while meeting the needs of industries, locally and internationally. FSKTM organisation chart is shown in diagram below.



Faculty External Examiner(s)

Prof. Dr. Abdul Azim b. Abd. Ghani
Professor
Faculty of Computer Science and Information Tecnology
Universiti Putra Malaysia
Serdang, Selangor Darul Ehsan

Prof. Dr. Abdul Hanan b. Abdullah
Professor
Faculty of Computing
Universiti Teknologi Malaysia
UTM Skudai, Johor Darul Ta'zim

Prof. Dr. Shahrul Azman b. Mohd Noah
Professor
Center for Artificial Intelligent Technology
Faculty of Information Science and Technology
Universiti Kebangsaan Malaysia
Bangi, Selangor Darul Ehsan

Prof. Dr. Ahmad Rafi b. Mohamed Eshaq
Vice President (Academic) & Professor
Faculty of Creative Multimedia
Multimedia University
Cyberjaya, 63100 Selangor

Faculty Advisor(s)

Dr. Nor Hazilawati bt. Awang
Chief Operating Officer of HeiTech i-Solution
HeitTech Padu Berhad
Selangor Darul Ehsan, Malaysia

En. Ahmad Zaman Nuri b. Muhamad
Assistant Vice President
Brilliance Information Sdn. Bhd.
Selangor Darul Ehsan, Malaysia

En. Kamaruzaman b. Jahidin
Chief Operating Officer
Gates IT Solution Sdn. Bhd.
Skudai, Johor, Malaysia

Faculty Staff Directory

Administration

Dean
Associate Prof.Dr. Nazri b. Mohd Nawi
PhD. (Data Mining), Swansea University, England

Deputy Dean (Academic & International)
Dr. Azizul Azhar b. Ramli
PhD. (Management Engineering), Waseda University, Japan

Deputy Dean (Research, Development and Publication)
Dr. Hairulnizam bin Mahdin
PhD. Information Technology, Deakin University, Australia

Head of Department (Student's Affairs & Alumni)
Dr. Mohamad Aizi b. Salamat
PhD. (Information Technology), Universiti Utara Malaysia, Malaysia

Senior Assistant Registrar
Mrs. Norfaizah bt. Ismail
Bachelor of Mass Communication (Publication), Universiti Teknologi Mara Malaysia, Malaysia

Dean's Secretary
Mr. Roshaidi b. Md. Daud
Diploma of Management and Office Technology, Universiti Teknologi Mara Malaysia, Malaysia

Deputy Dean's Secretary
Mrs. Nurulhuda bt. Hailani
Diploma of Management and Office Technology, Universiti Teknologi Mara Malaysia, Malaysia

Asst. Administrative Officer (Academic)
Mrs. Faridah bt. Mohd. Supanji
Sijil Pelajaran Malaysia, Sekolah Menengah Pergerakan Batu Pahat, Johor, Malaysia

Asst. Administrative Officer (Finance)
Mr. Jefri b. Ahmad
Diploma of Marketing, Politeknik Port Dickson, Malaysia

Senior Administrative Assistant (Office Management)
Mr. Indra Shahril b. Hj. Omar
Sijil Pelajaran Malaysia, Sekolah Menengah Dato' Bentara Luar, Batu Pahat, Johor, Malaysia

Administrative Assistant (Post Graduates)
Mrs. Ummu Hani bt. Ismail
Diploma of Management and Office Technology, Universiti Teknologi Mara, Malaysia

Administrative Assistant (Academic)
Mrs. Maslinda bt. Adam
Sijil Pelajaran Malaysia, Sekolah Menengah (P) Temenggong Ibrahim, Batu Pahat, Malaysia

Administrative Assistant (Finance)
Mrs. Izayana bt. Azman
Bachelor of Economy, Universiti Utara Malaysia, Malaysia

Administrative Assistant (Administration)
Mr. Norashid b. Hassan
Sijil Pelajaran Vokasional Malaysia, Sekolah Menengah Vokasional Batu Pahat, Johor, Malaysia

Administrative Assistant (Clerical/ Operation)
Mrs. Sarimah bt. Othman
Diploma of Computer Science, Kolej Islam Johor, Yayasan Pelajaran Johor, Malaysia

General Administration Assistant
Mr. Mohd. Azman b. Md. Wahab
Sijil Pelajaran Malaysia, Sekolah Menengah Kebangsaan Parit Betak, Pontian, Malaysia

Department of Multimedia

Head of Department
Dr. Noorhaniza bt. Wahid
PhD. (Computer Science), University of Sydney, Australia

Senior Lecturer & Director of Information Technology Center, UTHM
Dr. Mohd Farhan b. Md Fudzee
PhD. (Multimedia Computing), Deakin University, Australia

Senior Lecturer
Dr. Norhalina bt. Senan
PhD. (Information Technology), Universiti Tun Hussein Onn Malaysia, Malaysia

Lecturer
Mr. Azizan bin Ismail
MSc. (Computer Science), Universiti Putra Malaysia, Malaysia

Lecturer
Mrs. Rahayu bt. A. Hamid
MSc. (Computer Science), Universiti Teknologi Malaysia, Malaysia

Lecturer
Mrs. Suriawati bt. Suparjoh
MSc. (Information System), Universiti Malaya, Malaysia

Lecturer
Mrs. Norhanifah bt. Murli
MSc. (Information Technology), Universiti Teknologi Mara, Malaysia

Lecturer
Mr. Mohd Norasri bin Ismail
MSc. (Computer Science), Universirti Teknologi Mara, Malaysia
Lecturer
Mr. Muhammad Fakri bin Othman
MSc. (Computer Science), Universirti Puta Malaysia, Malaysia

Tutor (study Leave)
Mrs. Che Samihah bt. Che Dalim
MSc. (Computer Science), Universirti Puta Malaysia, Malaysia

Department of Software Engineering

Head of Department
Dr. Nureize bt. Arbaiy
PhD. (Soft Computing), Waseda University, Japan

Professor
Professor Dr. Hj. Mustafa b. Mat. Deris
PhD. (Computer Science), Universiti Putra Malaysia, Malaysia

Professor & Dean of Research and Development, ORICC, UTHM
Professor Dr. Rosziati binti Ibrahim
PhD (Software Engineering), Queensland University of Technology, Australia.

Senior Lecturer & Dean of Innovation, Commercialisation and Consultancy, ORICC, UTHM
Associate Prof. Dr. Hj. Mohd. Najib b. Mohd. Salleh
PhD. (Computer Science), University Of La Rochelle, France

Associate Professor & Deputy Director, International Office, UTHM
Associate Prof. Dr. Hjh. Rozaida bt. Ghazali
PhD. (Computer Science), Liverpool John Moores University, England

Senior Lecturer & Head of Department of Strategic and Quality Management Office, UTHM
Dr. Hj. Mohd. Zainuri b. Saringat
PhD. (Information Technology), Universiti Tun Hussein Onn Malaysia, Malaysia

Senior Lecturer & Deputy Dean of Research and Development, ORICC, UTHM
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PhD. Artificial Intelligence, Universiti Putra Malaysia, Malaysia

Senior Lecturer
Dr. Noraini bt. Ibrahim
PhD. (Information Technology), Universiti Tun Hussein Onn Malaysia, Malaysia

Senior Lecturer
Dr. Noor Azah bt. Samsudin
PhD. (Information Technology), University of Queensland, Australia

Lecturer
Dr. Muhaini bt. Othman
PhD. Computing Sciences, Auckland University of Technology (AUT), New Zealand.

Lecturer
Mrs. Norhanim bt. Selamat
MSc. (Real Time Software Engineering), Universiti Teknologi Malaysia, Malaysia

Lecturer
Mrs. Ruhaya bt. Ab. Aziz
MSc. (Computer Science), Universiti Teknologi Malaysia, Malaysia

Lecturer
Mrs. Munirah bt. Mohd Yusof
MSc. Knowledge Based Intelligent System, Universiti Utara Malaysia, Malaysia

Lecturer
Mrs. Rozlini bt Mohamed
MSc. (Computer Science), Universiti Teknologi Malaysia, Malaysia

Lecturer
Mrs. Zehan Afizah bt. Afip @ Afif
MSc. (Information Technology), University of Sheffield, England

Lecturer
Mrs. Hannani bt. Aman
MSc. (Computer Science), Universiti Putra Malaysia, Malaysia

Lecturer
Mrs. Yana Mazwin bt. Mohmad Hassim
MSc. (Computer Science), Universiti Malaya, Malaysia

Lecturer
Mrs. Norlida bt. Hassan
MSc. Intelligent System, Universiti Utara Malaysia, Malaysia

Lecturer
Mr. Mohd. Zaki b. Mohd. Salikon
MSc. Intelligent System, Universiti Utara Malaysia, Malaysia

Tutor (Study Leave)
Mr. Mohamad Firdaus b. Ab. Aziz
MSc. (Computer Science), Universiti Teknologi Malaysia, Malaysia

Tutor (Study Leave)
Mr. Mohd. Zanes b. Sahid
MSc. (Computer Science), Universiti Teknologi Mara, Malaysia

Tutor (Study Leave)
Mrs. Nur Ariffin b. Mohd Zin
MSc. (Computer Science), Universiti Kebangsaan Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Hazwani bt. Rahmat
MSc. (Computer Science), Universiti Putra Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Suhaila bt. Mohd. Yasin
MSc. (Computer Science), Universiti Teknologi Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Siti Mahfuzoh bt. Wasikon
MSc. (Information Technology), Universiti Tun Hussein Onn Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Mohd. Hamdi Irwan b. Hamzah
MSc. (Computer Science), Universiti Sains Malaysia, Malaysia

Department of Information Security

Head of Department
Dr. Isredza Rahmi bt. Abd.Hamid
PhD. Information Technology, Deakin University, Australia

Senior Lecturer & Head of Publishing Office, UTHM
Dr. Sapi'ee bin Hj. Jamel
PhD. (Information Technology), Universiti Tun Hussein Onn Malaysia, Malaysia

Senior Lecturer
Dr. Kamaruddin Malik bin Mohamad
PhD. (Information Technology), Universiti Tun Hussein Onn Malaysia, Malaysia

Senior Lecturer
Dr. Nurul Azma bt. Abdullah
PhD. (Information Technology), Universiti Tun Hussein Onn Malaysia, Malaysia

Senior Lecturer
Dr. Chuah Chai Wen
PhD. Information Technology, Queensland University of Technology, Australia

Lecturer
Mr. Shamsul Kamal bin Ahmad Khalid, CISSP, CEH
MSc. (Computer Science), Universiti Kebangsaan Malaysia, Malaysia

Senior Lecturer (Study Leave)
Mr. Nazri bin Abdullah
MSc. Computer Science, Universiti Teknologi Malaysia, Malaysia

Lecturer (Study Leave)
Mr. Khairul Amin bin Mohd Sukri
MSc. (Information Technology), Universiti Teknologi Mara, Malaysia

Lecturer (Study Leave)
Mr. Zubaile bin Abdullah
MSc. Information Technology, University of London, England

Tutor (Study Leave)
Mrs. Cik Feresa bt. Mohd Foozy
MSc. Computer (Information Security), Universiti Teknologi Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Siti Fadzlun bt. Mohd Salleh
MSc. Computer Science (Information Security), Universiti Teknologi Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Nordiana bt. Rahim
MSc. (Computer Science), Universiti Teknologi Malaysia, Malaysia

Tutor (Study Leave)
Mrs. P. Siva Shamala a/p Palaniappan
MSc. Computer Science (Information Security), Universiti Teknologi Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Nurul Hidayah bt. Ab Rahman
MSc. Computer Science (Information Security), Universiti Teknologi Malaysia, Malaysia

Department of Web Technology

Head of Department
Dr. Norfaradilla bt Wahid
PhD. (Computer Science), La Trobe University, Australia

Senior Lecturer
Dr. Shahreen bt. Kasim
PhD. Computer Science, Universiti Teknologi Malaysia, Malaysia

Associate Professor
Associate Prof. Dr. Rathiah bt. Hashim
PhD. Computer Science, Swansea University, England

Lecturer
Mrs. Hanayanti bt. Hafit
MSc. (Information Technology), Universiti Putra Malaysia, Malaysia

Lecturer
Mrs. Rozanawati bt. Darman
MSc. Computer Science, Universiti Putra Malaysia, Malaysia

Lecturer (Study Leave)
Mr. Firkhan Ali b. Hamid Ali
MSc. (Information Technology), Universiti Teknologi Mara, Malaysia

Lecturer (Study Leave)
Mrs. Hazalila bt. Kamaludin
MSc. (Information Technology), Universiti Teknologi Mara, Malaysia

Tutor (Study Leave)
Mr. Suhaimi bin Abd Ishak
MSc. (Computer Science), Universiti Malaya, Malaysia

Tutor (Study Leave)
Mrs. Nurul Aswa bt. Omar
MSc. (Information Tecnology - Management), Universiti Teknologi Malaysia, Malaysia

Tutor (Study Leave)
Mrs. Shazana bt. Md Zin
MSc. Computer Science, Universiti Putra Malaysia, Malaysia

Technical Staff

Asst. Engineer
Mrs. Jamaunah bt. Hj. Adnan
Certificate in Electronic Engineering (Communications), Politeknik Kota Bharu, Kelantan, Malaysia

Asst. Engineer
Mr. Razalee bin Md. Yusof
Certificate in Information Technology, Universiti Teknologi Mara, Malaysia

Asst. Engineer
Mr. Azizul Zamri bin Muhamed Amin
MSc. Information Technology, Universiti Teknologi Mara, Malaysia

Asst. Engineer
Mr. Mohd. Al Hafiz bin Nordin
Certificate in Electronic Engineering (Computer), Politeknik Sultan Hj. Ahmad Shah, Pahang, Malaysia

Asst. Engineer
Mr. Faizannizam bin Shahbudin
Certificate in Data Processing, Politeknik Sultan Hj. Ahmad Shah, Pahang, Malaysia

Asst. Engineer
Mrs. Siti Marlinee bt. Zainal Azizan
Bachelor of Information Technology (Networking), Universiti Teknologi Mara, Malaysia

Asst. Engineer
Mrs. Rafidah bt. Abu Bakar
Bachelor of Information Technology (Networking), Universiti Teknologi Mara, Malaysia

Asst. Engineer
Mr. Mohammad Hafiz bin Mt. Saidun
Certificate in Electrical Communication, Politeknik Shah Alam, Selangor, Malaysia

Asst. Engineer
Mr. Muhammad Nurhisyam Bin Md Ramli
Certificate in Electronic and Electronic, Politeknik Seberang Prai, Pulau Pinang, Malaysia

Asst. Engineer
Mr. Mohd. Asrul Nizam bin Mustari
Diploma of Electronic Engineering, Kolej Kemahiran Tinggi Mara, Malaysia

Programme Name

Bachelor of Computer Science (Multimedia Computing) with Honours

Programme Aims

To produce graduates that can apply knowledge and skills; solve problems analytically, effectively, innovatively and fit to market trends; communicate effectively and work in team; abide to high moral and ethical standards and lead as able and responsible leaders

Programme Educational Objectives (PEO)

These are the PEOs for Bachelor of Computer Science (Multimedia Computing) with Honours:

PEO 1	Apply fundamental knowledge, principles and skills in Computer Science to meet job specifications **(Knowledge, Skills)**;
PEO 2	Have strong analytical and critical thinking skills to solve problems innovatively and market-oriented **(Critical Thinking and Problem Solving Skills, Continuous Learning, Entrepreneurship)**;
PEO 3	Have communication, teamwork and interpersonal skills **(Teamwork Skills, Communication Skills)**;
PEO 4	Perform duties professionally with high moral and ethical standards and lead as able and responsible leader **(Moral and Professional Ethics, Leadership Skills)**

Programme Learning Outcomes (PLO)

These are the PLOs for Bachelor of Computer Science (Multimedia Computing) with Honours:

PLO 1	Apply knowledge of essential facts, concepts, principles and theories relating to Computer Science (**K – Knowledge**);
PLO 2	Use Computer Science knowledge in analysing, modelling, designing, developing and evaluating efficient computing solutions (**PS – Practical Skills**);
PLO 3	Communicate effectively via writing and speaking to convey information and present problems and solutions (**CS - Communication Skills**);
PLO 4	Utilise analytical and critical thinking skills in problem solving (**CTPS – Critical Thinking and Problem Solving**);
PLO 5	Demonstrate teamwork, interpersonal and social skills effectively and confidently (**TS – Teamwork Skills**);
PLO 6	Apply skills and principles of lifelong learning in academic and career development (**LL – Lifelong Learning**);
PLO 7	Develop entrepreneur character traits in career development (**KK – Entrepreneur Skills**);
PLO 8	Demonstrate professionalism and value social, ethical and humanistic considerations (**EM – Moral and Professional Ethics**);
PLO 9	Perform leadership duties effectively (**LS – Leadership Skills**);

Curriculum Structure

Table 1: Summary of curriculum for the Bachelor of Computer Science (Multimedia Computing) with Honours.

Year	Semester	Course Code	Courses	Credit	Total
1	I	UWB 10100	Foundation English*	0	17
		UWB 10102	Academic English	2	
		UMB 1**02	Foreign Language	2	
		UWA 10102/10202	Islamic Studies/ Moral Studies	2	
		UQ* 1**01	Co-Curriculum I	1	
		BIC 10103	Discrete Structure	3	
		BIC 10204	Algorithms and Programming	4	
		BIC 10303	Algebra	3	
	II	UWA 10302	Islamic and Asian Civilisations	2	18
		UWB 10202	Effective Communication	2	
		UQ* 1***1	Co-Curriculum II	1	
		BIC 10404	Data Structure	4	
		BIC 10503	Computer Architecture	3	
		BIC 10603	Statistics	3	
		BIM 10103	Fundamentals of Multimedia Computing	3	
	III	BIC 10703	Computing Skills	3	6
		BIM 10203	Digital Audio and Video Technology	3	
2	I	UWB 20302	Technical Writing	2	18
		UWS 10103	Nationhood and Recent Development **	3	
		BIC 20803	Operating System	3	
		BIC 20904	Object Oriented Programming	4	
		BIC 21003	System Analysis and Design	3	
		BIM 20303	Computer Graphics and Animation	3	
	II	UWS 10202	Ethnic Relations***	2	18
		BIC 21102	Professional Ethics and Occupational Safety	2	
		BIC 21203	Web Development	3	
		BIC 21303	Computer Networks	3	
		BIC 21404	Database	4	
		BIM 20404	Multimedia Systems and Applications	4	
3	I	BIC 31502	Creativity and Innovation	2	18
		BPK 20802	Entrepreneurship	2	
		BIM 30503	Human-Computer Interaction	3	
		BIM 30603	Mobile Applications Development	3	
		BIM 30703	Multimedia Project Management	3	
		BIC 31602	Degree Project I	2	
		BIM 33*03	Elective 1	3	
	II	BIM 30803	Virtual Reality	3	16
		BIC 31704	Degree Project II	4	
		BIM 33*03	Elective 2	3	
		BIM 33*03	Elective 3	3	
		BIM 33*03	Elective 4	3	
4	I	BIC 41812	Industrial Training	12	12
			Total Credit		123

* MUST be taken by students who obtained MUET Band 2 and below. It cannot be registered together with UWB 10102.

** For International students, this course will be replaced by UWS 10303: Malaysian Studies and Culture.

*** For International students, this course will be replaced by UWB 11202: Malay Language.

Table 2: List of elective courses in Bachelor of Computer Science (Multimedia Computing) with Honours

Field	Course Code	Elective Courses	Credit
Multimedia Computing	BIM 33003	Rich Internet Application Development	3
	BIM 33103	Computer Games Development	3
	BIM 33203	Image Processing	3
	BIM 33303	Digital Media Processing	3
	BIM 33403	Multimedia Security Technologies	3
	BIM 33503	Data Visualisation	3
	BIM 33603	Special Topics in Multimedia Computing	3

Synopsis of University Courses

UWB 10100 Foundation English

Synopsis

This course focuses on essential English grammar skills and introduces language learning with a focus on grammatical terminology, concepts and exercises. It provides opportunities for students to acquire basic grammar knowledge to complement the acquisition of English language. In addition, students' oral and written skills will be reinforced and they would be able to use English for a wide range of academic activities.

References

1. Koh, S.L. & Tan, S. L. (2003). *Grammar made easy.* Petaling Jaya: Prentice Hall. [PE1112.K63 2003]
2. Milon, N. (2002). *Mastering English the easy way: The all in one guide to Basic English grammar.* Subang Jaya, Selangor: Pelanduk Publications. [PE1097 .N36 2002]
3. Werner, P.K. & Spaventa, L. (2002). *Mosaic 1: Grammar*. New York: McGraw-Hill. [PE1128.W472 2002 N1]
4. Werner, P.K. & Spaventa, L. (2002). *Mosaic 2: Grammar*. New York: McGraw-Hill. [PE1128.W48 2002]
5. Fuchs, *et al*. (2001). *Grammar Express:for self study and classroom use*. New York: Longman. [PE1114.F83 2001]
6. Schoenberg, I.E. (1994). *Focus on Grammar: a basic course for reference and practise*. New York: Addison-Wiley. [PE1128 .S24 1994]

UWA 10102 Islamic Studies

Synopsis

This course explains about Islamic concept as ad-deen. It discusses the study of al-Quran and al-Hadith, Sunnism, schools of Islamic theology, development of schools of Fiqh, principles of muamalat, Islamic Criminal Law, Islamic work ethics, issues in Islamic family law and current issues.

References

1. Harun Din (Dr.) (2001), *Manusia Dan Islam,* cetakan pertama, Kuala Lumpur: Dewan Bahasa dan Pustaka. [BP174. M36 1990]
2. Mustafa Abdul Rahman (1998), *Hadith 40*, Kuala Lumpur: Dewan Pustaka Fajar. [BP135. A2 M87 1998]
3. Ismail Haji Ali, (1995), *Pengertian dan Pegangan Iktikad yang benar: Ahli Sunnah Wal Jamaah:* Kuala Lumpur: Penerbitan al-Hidayah. [BP166.78. P46 1995]
4. Paizah Haji Ismail (1991), *Undang-undang Jenayah Islam*, Kuala Lumpur: Dewan Pustaka Islam, Angkatan Belia Islam Malaysia. [BP144. P35 1991]
5. Mustafa Haji Daud (1989), *Institusi Kekeluargaan Islam,* Kuala Lumpur: Dewan Pustaka dan Bahasa. [BP188.3. F3.M87 1989]

UWA 10202 Moral Studies

Synopsis

This course explains on concepts of moral, aspects of moral and its importance in daily lives, Western moral theories and moral values of great religions of the world, moral values in work and current moral issues.

References

1. Mohd Nasir Omar. (2010). *Falsafah Akhlak*, Penerbit Universiti Kebangsaan Malaysia, Bangi. [BJ1291 .M524 2010].
2. Hussain Othman. (2009). *Wacana Asasi Agama dan Sains.* Batu Pahat: Penerbit UTHM. [BL 240.3 H87 2009ª].
3. Hussain Othman, S.M. Dawilah Al-Edrus, Berhannudin M. Salleh & Abdullah Sulaiman. (2009). *PBL Untuk Pembangunan Komuniti Lestari*. Batu Pahat: Penerbit UTHM. [LB 1027.42 P76 2009a].
4. Eow Boon Hin. (2002). *Moral Education*. Longman. [LC268 .E48 2008].
5. Ahmad Khamis. (1999). *Etika Untuk Institusi Pengajian Tinggi*. Kuala Lumpur: Kumpulan Budiman. [LC315.M3 .A35 1999].

UWB 10602 French Language

Synopsis

This course is designed for students to learn the basic of French. Students are exposed to the skills of listening, reading, speaking and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using French.

References

1. Booth, Trudie Maria, (2008). French Verbs Tenses. McGraw-Hill. Call no.: [PC 2271, U66 2008].
2. Heminway, Annie, (2008). Complete French Grammar. McGraw-Hill. Call no.: [PC2112, H45 2008].
3. Price, Glanville, (2003). A Comprehensive French Grammar. Blackwell Publishing. Call no.: [PC2112. P74, 2003].
4. Hatier. (2002). Le Nouveau Bescherelle 12,000 French Verbs. English Edition. Paris: Librairie Hatier.
5. Hatier, (1995). Le Nouveau Bescherelle Complete Guide 12 000 French Verbs. Paris: Librairie Hatier.
6. Kaneman-Pougatch, Massia et al, (1997). Méthod de français: Café Crème 1. Paris: Hachette F.L.E.
7. Grégoir, Maïa et al, (1995). Grammaire Progressive du Français avec 500 exercices. Paris: CLE International.
8. Miquel, Claire Leroy et al, (1995). Vocabulaire Progressive du Français avec 250 exercices. Paris: CLE International.
9. Capelle, Guy et Gidon, Noëlle, (1995). Méthod de français: Le Nouvel Espaces 1. Paris: Hachette F.L.E.
10. French Dictionary (1999). The New Collins Robert 5th Edition. Paris: Harper Collins Publishers.

UWB 10902 Mandarin Language

Synopsis

This course is designed for students to learn the basic of Mandarin. Students are exposed to the skills of listening, reading, speaking and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Mandarin Language.

References

1. Lim Hong Swan, Yeoh Li Cheng, (2010). *Mandarin Made Easy Through English.* Batu Pahat: Penerbit UTHM. [PL1129.E5 .L554 2009 a]
2. Liu Xun (2010). *New Practical Chinese Reader: Textbook*. China: Beijing Language and Culture University Press. [PL1129.E5 .L58 2010]
3. Kang Yuhua (2007). *Conversational Chinese 301:Vol. 2*. China:Beijng Language and Culture University Press. [PL1121.C5 .K364 2007]
4. Liping Jiang (2006). *Experiencing Chinese*. China: Higher Education Press. [PL1129.E5 .T59 2006]
5. Kang Yuhua (2005). *Conversational Chinese 301*. China: Beijing Language and Culture University Press. [PL1121.C5 .K36 2005]

UWB 11002 Malay Language

Synopsis

This course is designed for students to learn the basic Malay language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Malay language.

References

1. Ainun Mohd (2011). *Tesaurus Bahasa Melayu*. PTS Professional Publishing. [PL5123 .A364 2011]
2. Kamaruddin Saad (2009). *105 karangan bahasa melayu UPSR.* Minerva Publishing. [PL 5108 KAM 2009]
3. Nik Safiah Karim (2008). *Tatabahasa Dewan*. [DBP. PL5108 .T37 2008 r]
4. Asmah Hj. Omar (1993). Susur Galur Bahasa Melayu. [DBP: KL. PL5127 .A85 1993 N1]
5. Asmah Hj. Omar (1993). *Nahu Melayu Mutakhir*. [DBP: KL. PL5137 .A85 1993]
6. Asmah Hj. Omar (1985). *Kamus Ayat*. Eastview. [PL5091 .A85 1985 rd]

UWB 11202 Arabic Language

Synopsis

This course is designed for students to learn the basic of Arabic. Students are exposed to the skills of listening, reading, speaking and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Arabic.

References

1. Mohd Hisyam Abdul Rahim; Ahmad Sharifuddin Mustapha; Mohd Zain Mubarak (2008). *Bahasa Arab UMR 1312*. Batu Pahat: Penerbit UTHM. [PJ6115 .M445 2008 a]
2. Abu 'Amiir 'Izzat. (2008). *Kamus adik: bahasa Melayu-bahasa Inggeris-bahasa Arab.* Kuala Terengganu: Pustaka Darul Iman. [PJ6640 ABU 2008]

3. Ab. Halim Mohammed; Rabiyah Hajimaming; Wan Muhammad Wan Sulong. (2007). *Bahasa Arab Permulaan.* Serdang: Penerbit UPM. [PJ6065 .A32 2007]
4. Abdullah, Mustaffa Siti Rohaya Sarnap Siti Sujinah Sarnap. (2006). *Cara mudah belajar Bahasa Arab*. Singapore: Jahabersa. [PJ6106 .A22 2006]
5. Mohd Hisyam bin Abdul Rahim. (2005). *Senang Berbahasa Arab*. Batu Pahat: Penerbit KUiTTHO. [PJ6115 .M44 2005 a]
6. Mohd Azani Ghazali, Abdul Aziz Hassan @ Yahya. (2000). *Kamus ringkas Bahasa Melayu-Bahasa Arab.* Johor Bahru: Jahabersa. [PL5091.8 .A7 .M393 2000 rd]
7. Fuad Ni'mat. (1973). *Mulakhass qawa'id al-lughatul 'arabiyyah.* Damsyik: Darul Hikmah. [PJ5161 .F62 1973]

UWB 10802 Japanese Language

Synopsis

This course is designed for students to learn the basic Japanese language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Japanese language.

References

1. Surie, Network (2010). AE Minna no Nihongo 1-2 Elementary: Translation and Grammatical Notes, Tokyo: 3A Corporation. [PL539.3 .M57 2010]
2. Surie, Network (2010). AE Minna no Nihongo 1-1 Elementary: Main Textbook, Tokyo: 3A Corporation. [TK7885.7 .V44 2000r]
3. Surie, Network (2009). AE Minna no Nihongo 1-1 Elementary: Translation and Grammatical Notes, Tokyo: 3A Corporation. [PL539.3 .M567 2009]
4. Surie, Network (2009). AE Minna no Nihongo 1-2 Elementary: Main Textbook, Tokyo: 3A Corporation. [PL539.3 .M569 2009]
5. Rosmahalil Azrol Abdullah, (2008) : Bahasa Jepun (UMJ 1312): Learning Module (2nd Edition), Batu Pahat. Penerbit UTHM. [PL539.3 .R67 2008a].
6. Surie Network, (2000). Minna no Nihongo: Kaite Oboeru, Tokyo: 3A Corporation. [PL539.3 .M56 2000]
7. M. Rajendran, (1991) Malay Japanese English Dictionary, Petaling Jaya: Pelanduk Publications. [PL5125 .R34 1991rd].
8. Surie Network, (1998). Minna no Nihongo: Main Textbook - Shokyu 1, Tokyo: 3A Corporation. [PL539.3 .M574 1998]
9. Yoshida, Masatoshi Nakamura, Yoshikatsu, (1996). Kodansha's Furigana English-Japanese dictionary: the essential dictionary for all students of Japanese, Tokyo: Kodansha International. [PL679. Y67 2006rd]
10. The AOTS, (1977). *Shin Nihongo no Kiso*: Japanese Kana Workbook, Tokyo: 3A Corporation. [PL539.3 .S54 1977]

UWB 10702 German Language

Synopsis

This course is designed for students to learn the basic German language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using German language.

References

1. Astrid Henschel, (2006). *German Verb Tenses.* New York: McGraw-Hill. [PF3301. H46 2006]
2. Gabriele Kopp, Siegfried Büttner, (2004). *Planet 1: Deutsch für Jugendliche: Kursbuch.* Ismaning: Germany: Hueber Verlag. [PF3129. K664 2004]
3. Gabriele Kopp, Siegfried Büttner, (2004). *Planet 1: Deutsch für Jugendliche: Arbeitsbuch.* Ismaning: Germany: Hueber Verlag. [PF3129. K664 2004]
4. Heiner Schenke, (2004). *Basic German: a grammar and workbook.* London: Routledge. [PF3112.5. 35 2004]
5. Robert Di Donato (2004). *Deutsch, Na Klar!* Boston: McGraw-Hill. [PF3112. D36 2004]

UWB 11102 Spanish Language

Synopsis

This course is designed for students to learn the basic Japanese language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Japanese language.

References

1. Nurul Sabrina Zan, (2010). *Hola! Hablo español* First Edition Batu Pahat: Penerbit UTHM. [PC4445 .N72 2010a]
2. Salina Husain, (2005). *Vamos a aprender español lengua extranjera* Batu Pahat: Penerbit UTHM. [PC4121 .S24 2005a]
3. Bey, Vivienne (2004). *Spanish verbs drills*. Mc. Graw Hill. [PC4271 .B49 2004]
4. Terrell, Tracy D. (2003). *Dos mundos*. Mc. Graw Hill. [PC4129.E5 .D67 2003]
5. O'Connor, Niobe (2002). *Caminos 1.* Nelson Thornes. [PC4121 .O36 2002]
6. Vox modern Spanish and English dictionary: English-Spanish/Spanish-English (1986) National Textbook. Co. XX(131882.1)

UWB 11302 Javanese Language

Synopsis

This course is designed for students to learn the basic Javanese language. Students are exposed to the skills of listening, reading, speaking, and writing with basic vocabulary, grammar and structure. Students are also exposed to the real daily situations which will help them to communicate using Javanese language.

References

1. Purwanto, Eko (2011). Pepah Bahasa Jawi. Cara mudah belajar cepat dan tuntas bahasa Jawa. Diva press. XX(131748.1)
2. Majendra, Maheswara (2010). *Kamus lengkap Indonesia-Jawa, Jawa-Indonesia/ Majendra Maheswara*. Pustaka Mahardika. XX(131732.1)
3. Budhi Santosa, Iman. (2010). *Nguri-uri paribasan Jawi = Melestarikan peribahasa Jawa.* Intan Pariwara. XX(131751.1)
4. Yrama, Widya (2008). *Cara belajar membaca dan menulis huruf jawa, jilid 1.* Yrama Widya. Publication info:, 2008 XX(131738.1)
5. Yrama, Widya (2008). *Cara belajar membaca dan menulis huruf jawa, jilid 2.* Yrama Widya .Publication info:, 2008 XX(131739.1)

UWS 10103 Nationhood and Current Development of Malaysia

Synopsis

This course will provide students a fundamental concept, the processes of formation and development of Malaysia. The topics covered include the concept of state, Malacca Kingdom, implication of imperialism and colonization, spirit of patriotism and nationalism, independence and formation of Malaysia. Besides, students will also be exposed to the constitution of Malaysia, Malaysian Government System, Economic and Social Development Policy as the main policy in the national development. At the end of the course students will able to appreciate the roles and responsibilities of a good citizen to the country.

References

1. Zahrul Akmal Damin, Fauziah Ani, Lutfan Jaes, Khairunesa Isa, Siti Sarawati Johar, Harliana Halim, Khairul Azman Mohd Suhaimy, Shamsaadal Sholeh Saad, Ku Hasnan Ku Halim dan Mohd Akbal Abdullah (2009). Kenegaraan & Pembangunan Malaysia. Batu Pahat: Penerbit UTHM.
2. Ruslan Zainudin, Mohd Mahadee Ismail & Zaini Othman. (2005). Kenegaraan Malaysia. Shah Alam: Fajar Bakti. [JQ715 .R87 2005].
3. Nazaruddin Mohd Jali, Ma'rof Redzuan, Asnarulkhadi Abu Samah & Ismail Mohd Rashid. (2005). Pengajian Malaysia. Petaling Jaya: Prentice Hall. [DS596.6 .P46 2001 N2].
4. Mohd Ashraf Ibrahim. (2004).Gagasan Bangsa Malayan yang Bersatu 1945-57. Bangi: Penerbit UKM. [DS597 .M37 2004].
5. Noor Aziah Mohd Awal. (2003). Pengenalan kepada Sistem Perundangan di Malaysia. Petaling Jaya: International Law Book Services. [KPG68 .N66 2003].

UWS 10303 Malaysian Studies and Culture

Synopsis

This course will provide students in basic understanding of Malaysia from various perspectives. Topics to be discussed include Malaysia in relation to its history, achievement and international affairs. In addition, students will also be exposed to the ethnic composition of the country, culture and heritage. Teaching and learning process enables student to acquire knowledge and appreciates the reality of life in Malaysia through experiential learning.

References

1. Abdul Halim Nasir. (2004). *Mosque Architecture in the Malay World*. Bangi: Penerbit Universiti Kebangsaan Malaysia. [NA4670 .A23 2004].
2. Nazaruddin Mohd. Jali. (2003). *Malaysian Studies: Nationhood and Citizenship*. Petaling Jaya: Pearson Prentice Hall.
3. Francis Loh kok Wah dan Khoo Boo Teik. (2002). *Democracy in Malaysia. Cornwall*: Curzon Press.
4. Khoo Kay Kim. (2001). *Malay Society: Tranformation and Democratisation*. Kelana Jaya: Pelanduk Publications.
5. Yahaya Ismail. (1989). *The Cultural Heritage of Malaysia*. Kuala Lumpur: Dinamika Kreatif Sdn. Bhd.
6. Andaya, B.W. and Andaya, L. Y. (1982). *A History of Malaysia*. London: Macmillan. [DS596 .A52 2001].
7. Mohamed Noordin Sopiee. (1974). *From Malayan Union to Singapore Separation, Political Unification in the Malaysian Region, 1945-65*. Kuala Lumpur: University of Malaya Press. [DS597 .M56 2005].

Synopsis of Program Courses

BIC 10103 Discrete Structure

Prerequisite Course(s): None

Synopsis

This course discusses concept of discrete mathematics and its application in ICT. Topics include principles of basic logic and proving, set, mathematical induction, relations and functions, normal relation, algorithm and graph theory.

References

1. Rosen, K., 2007. Discrete mathematics and its applications. 6th ed. New York: McGraw Hill. Call number: QA 39.2 .R65 2007
2. Kolman, B., Busby, R. & Ross, S., 2008. Discrete mathematical structures. 6th ed. Upper Saddle River, NJ: Prentice Hall. Call number: QA76.9.M35 .K64 2004
3. Johnsonbaugh, R., 2008. Discrete mathematics. 7th ed. Upper Saddle River, NJ: Prentice Hall. Call number: QA39.2 .J63 2009
4. Stanoyevitch, Alexander., 2011. Discrete structures with contemporary applications. Chapman & Hall/CRC Press. Call number: QA76.9.M35 .S73 2011
5. Krantz, S. G. 2009. Discrete mathematics demystified. New York: McGraw-Hill.Call number: QA76.9.M35 .K72 2009

BIC 10204 Algorithm and Programming

Prerequisite Course(s): None

Synopsis

This course introduces algorithm principles in problem solving and computer programming. Topics include introduction to computer programming, problem solving and algorithm, basic structure of programming, input and output data, control statement, function, array, data structure and pointer.

References

1. Deitel, P. J. & Deitel, H. M., 2009. *C++ how to program.* 7th ed. Upper Saddle River, New Jersey: Prentice Hall. Call Number: QA76.73.C153 .D44 2009
2. Levitin, A. V., 2007. *Introduction to the design and analysis of algorithms.* 2nd ed. Harlow: Addision Wesley. Call Number: QA76.9.A43 .L48 2007
3. Malik, D. S., 2011. *C++ programming: from problem analysis to program design.* Boston, MA: Course Technology. QA76.73.C153 .M345 2011
4. Stroustrup, B., 2009. Programming: principles and practice using C++. Reading, MA: Addison Wesley.Call Number: QA76.73.C153 .S78 2009
5. Gaddis, T., 2008. *Starting out with C++: from control structures through objects.* 6th ed. Reading, MA: Addison Wesley. Call Number: XX(129998.1)

BIC 10303 Algebra

Prerequisite Course(s): None

Synopsis

Real Number: real number system, notation and inequality, exponent, surd and logarithm. **Equation and Inequality:** Linear equation, formula and application, quadratic equation and application, other equation, inequality, absolute inequality. **Polynomial:** Basic concept, algebra operation for polynomial, remainder theorem and factor theorem, synthetic divider, quadratic equation, inequality and partial fraction. **Function and Graph:** Relationship and function, domain and range, special graph function: constant function, linear function, quadratic function, cubic function, square function, ratio

function, absolute value function and piecewise function, operation for functions, inverse function. **Matrices:** Definition and notation, algebra operation for matrices, elementary row operation, determinant, inverse of matrices. **Linear Equation System:** Introduction, linear equation system of two variables, linear equation system of multiple variables. Matrices method: Inverse matrices, Gauss-Jordan elimination, Cramer's rule.

References

1. Bittinger, Marvin L. (2011) *Intermediate Algebra*. Pearson Education. Call Number: QA154.3 .B57 2011
2. Woodbury, George (2009) *Elementary and Intermediate Algebra*. Pearson. Call Number: QA152.3 .W66 2009
3. Lial, Margaret L. (2012) *Beginning and intermediate algebra Intermediate Algebra*. Pearson Addison-Wesley. Call Number: QA152.3 .L524 2012
4. Patricia, F. (2004) *College Algebra Student Solutions Manual*. New York: Pearson Education.
5. Lipschutz, Seymour (2009) *Schaum's outline of Linear Algebra* .Singapore: Mc Graw Hill International Ed.Call Number: QA188 .L56 2009

BIC 10404 Data Structure

Prerequisite Course(s): Taken BIC10204 Algoritma and Programming

Synopsis

This course introduces the concept of data structure in computer programming. Topics include introduction to data structure, data type and data abstraction, linked list, stack, queue, search and sorting, tree and graph.

References

1. Weiss, M.A., 2006. *Data structures and algorithm analysis in C++.* 3rd ed. Harlow: Addision Wesley. Call number: QA76.73.C153 .W44 2006.
2. *Malik, D.S., 2009.* Data structures using C++. *2nd ed. Boston: Course Technology.*
3. Dale, N. B., 2007. *C++ plus data structures*. 3rd ed. Sudbury, MA: Jones & Bartlett Publishers. Call number: QA76.73.C153 .D346 2007.
4. Brandle, S., Geisler, J., Roberge, J. & Whittington, D., 2009. *C++ data structures: a laboratory course*. 3rd ed. Sudbury, MA: Jones and Bartlett Publishers. Call number: QA76.73.C153 .D37 2009.
5. Main, M. & Savitch, W. J., 2011. *Data structures & other objects using C++.* 4th ed. Boston, MA: Addison Wesley. Call number : QA76.73.C153 .M38 2011.

BIC 10503 Computer Architecture

Prerequisite Course(s): None

Synopsis

This course exposes students to the knowledge and skills in computer architecture. Topics include introduction to computer architecture, bus system, memory organization, input/output, computer arithmetic, instruction set, and central processing unit (CPU) and control unit.

References

1. Stallings, W., 2006. *Computer organization and architecture: designing for performance.* 7th ed. Upper Saddle River, NJ: Prentice Hall. Call number: QA76.9 .S72 2006
2. Patterson, D. A. & Hennessy, J. L., 2008. *Computer organization and design: the hardware/software interface.* 4td ed. San Francisco: Morgan Kaufmann. Call number: QA76.9.C643 .P37 2009
3. Harris, D. & Harris, S., 2007. *Digital design and computer architecture.* San Francisco: Morgan Kaufmann Publishers.

4. Dumas, J. D., 2006. *Computer architecture: fundamentals and principles of computer design.* Boca Raton, FL: CRC Press. Call number: TK7885 .D85 2006
5. Tanenbaum, A. S., 2005. *Structured computer organization.* 5th ed. Upper Saddle River, NJ: Prentice Hall. QA76.6 .T38 2006

BIC 10603 Statistics

Prerequisite Course(s): None

Synopsis

Descriptive Statistics: statistics definition, sampling technique, frequency distribution, graph, Central Tendency measure and variance. **Random variable**: Discrete and continuous random variables, expected value and variance. **Probability distribution**: Binomial, Poisson and Normal distribution. **Sampling distribution**: sampling distribution for mean, difference two means, variance and ratio of 2 variances, t-distribution, chi-square distribution and F-distribution. **Estimation**: point and interval estimation. Confidence interval for mean, difference two means, variance and ratio of 2 variances. **Hypothesis testing**: test of mean, difference two means, variance, ratio of 2 variances and difference between 2 samples. **Matrices**: Cramer Rule, Inverse Matrices. **Calculus**: Differentiation, Integration, Stock Control, Economic Ordered Quantity.

References

1. Allan G.Bluman (2007) Elementary Statistics. *A step by Step Approach*. MacGraw Hill International Edition. Call number: QA276.12 .B58 2007
2. Mario F. Triola. (2005) *Essential of Statistics*. 2nd Ed. Pearson Adison Wesley. Call number: QA276.12 .T74 2011
3. M.K Berenson, D.M. Levine & T.C. Krehbiel. *Basic Business Statistics – Concepts and Application* 10th edition. Prentice Hall. 2007. Call number: HF1017 .B47 2007
4. Douglas C. Montgomery, George C. Runger & Norma Faris Hubele. *Engineering Statistics*. John Wiley. 1998. Call number: QA2776.12 .M66 1998
5. Larsen, Richard J.(2012), *An Introduction to mathematical statistics and its applications*. 5th Ed. Pearson Adison Wesley. Call number: QA276 .L37 2012
6. Bowerman, Bruce L,(2012). *Essentials of business statistics.* 4th Ed. MacGraw Hill International Edition. Call number: HF1017 .E87 2012

BIC 10703 Computing Skills

Prerequisite Course(s): None

Synopsis

This course introduces three basic skills in information and communication technology. Skills include hands-on experience in maintaining computer systems, producing multimedia product and developing web site. Also included are internet-based business and marketing strategies using the latest web technology.

References

1. Meyers, M. & Haley, D., 2004. *Mike meyers' a+ guide to managing and troubleshooting pc lab manual.* New York: McGraw-Hill Professional. Call number: QA76.3 .M494 2004.
2. *Schmidt, C.A., 2008.* The complete a+ guide to PC repairs. *Boston: Addison-Wesley. Call number: TK7887 .S35 2008.*
3. *Vaughn, T., 2011.* Multimedia: making it work. *8th ed. New York: McGraw Hill. Call number: QA76.575 .V38 2011.*
4. *Felke-Morris, T., 2011.* Web development and design foundations with xhtml. *5th ed. Boston, MA: Addison-Wesley. Call number: QA76.76.H94 .F44 2011.*
5. *Kling, A.A., 2011.* Web 2.0. *Farmington Hill, MI: Lucent Books. Call number: TK5105.88817 TEC 2011.*

6. Cashman, S., Andrews, J., & Jedlicka, L., 2004. *Understanding & troubleshooting your pc*. Canada: Course Technology.
7. *Savage, T. M., & Vogel, K. E., 2009.* An introduction to digital multimedia. *Sudbury, MA: Jones & Bartlett Publishers.*
8. *Shuen, A., 2008.* Web 2.0: a strategy guide*. Sebastopol, CA: O'Reilly Media.*

BIC 20803 Operating System

Prerequisite Course(s): None

Synopsis

This course exposes students to the knowledge and skills in operating system management. Topics include introduction to operating system, computer system structure, operating system structure, process, CPU timetabling, deadlock, memory management, virtual memory and file system.

References

1. Silberschatz, A., Galvin, P. B. & Gagne, G., 2008. *Operating system concepts.* 8th ed. Hoboken, NJ: John Wiley and Sons.
2. Stallings, W., 2008. *Operating system: internals and design principles.* 6th ed. Upper Saddle River, NJ: Prentice Hall. Call number: QA76.76.O63 .S74 2009.
3. Tanenbaum, A. S., 2007. *Modern operating systems.* 3rd ed. Upper Saddle River, NJ: Prentice Hall.
4. Davis, W. S., & Rajkumar, T. M., 2005. *Operating system: a systematic view*. 6th ed. Boston, MA: Addison Wesley. Call number: QA76.76.O63 .D29 2005.
5. Bhatt, Pramod Chandra P., 2007. *An introduction to operating systems: concepts and practice.* 2nd ed. New Delhi: Prentice Hall. Call number: QA76.76.O63 .B42 2007.

BIC 20904 Object-oriented Programming

Prerequisite Course(s): Taken BIC10204 Algoritma and Programming

Synopsis

This course exposes students to the concept of object-oriented programming (OOP). Topicsinclude introduction to OOP, primitive data types and operators, fundamentals of OOP language, object and class,andinheritance and polymorphism.

References

1. Ibrahim, R., 2008. *Introduction to object-oriented programming with UML using Borland C++*. Batu Pahat: Penerbit Universiti Tun Hussein Onn Malaysia. Call number: QA76.64 .R67 2008 a.
2. Liang, Y.D., 2007. *Introduction to java programming: comprehensive version.* 6th ed. Upper Saddle River, NJ: Prentice Hall. Call number: QA76.73.J38 .L52 2007.
3. Morelli, R. & Walde, R., 2006. *Java, java, java: object-oriented problem solving.* 3rd ed. Upper Saddle River, NJ: Prentice Hall. Call number: TK7867 .H67 2006.
4. Deitel, I. & Deitel, J., 2007. *Java how to program.* 7th ed. Upper Saddle River, NJ: Prentice Hall. Call Number: QA76.73.J38 .D44 2007.
5. Lewis, J. & Loftus, W., 2012. *Java software solutions: foundations of program design.* 7th ed. Boston, MA: Addison Wesley. Call Number: QA76.73.J38 .L48 2012.
6. Sanders, K. E. & Dam, A. V., 2006. *Object-oriented programming in java: a graphical approach*. Harlow: Addison-Wesley. Call number: QA76.64 .S26 2006.

BIC 21003 System Analysis and Design

Prerequisite Course(s): None

Synopsis
This course exposes students to system and analysis design. Topics include software development environment, introduction to system analysis and design, identification and project selection, determining system requirements, process and logical models, data models, transition of analysis to design, designing input, output,interface and system architecture.

References

1. Kendall, K. E. & Kendall, J. E., 2010. *Systems analysis and design.* 8th ed. Upper Saddle River: Prentice Hall.
2. Hoffer, J. A., George, J. F. & Valacich, J.S., 2010. *Modern systems analysis and design.* 6th ed. Upper Saddle River: Prentice Hall.
3. Shelly, G. B. & Rosenblatt, H. J., 2011. *Systems analysis and design.* 8th ed. Boston: Course Technology. Call number : T57.6 .S33 2011.
4. Dennis, A., Wixom, B. H., & Roth, R. M., 2009. *Systems analysis and design.* 4rd ed. New Jersey: John Wiley and Sons. Call number: QA76.9.S88 .D46 2009.
5. Marakas. G. M., 2006. *Systems analysis and design: an active approach.* 2nd ed. Boston: McGraw Hill. Call number: QA76.9.S88 .M37 2006.

BIC 21102 Professional Ethics and Occupational Safety
Prerequisite Course(s): None

Synopsis
This course discusses topics related to professional ethics in computing. Topics include introduction to professional ethics in computing, professional ethics and responsibilities, personality in computing ethics, security and control, copyright and intellectual property, freedom of speech, politeness, filtering and pornography, and cyber laws in Malaysia.

References

1. Quinn, M. J., 2010. *Ethics for the information age.* 4th ed. Boston: Addison Wesley. Call Number: QA76.9.M65 .Q74 2011
2. Baase, S., 2008. *A gift of fire: social, legal and ethical issues for computer and the Internet.* 3rd ed. Upper Saddle River, NJ: Prentice Hall.
3. Reynolds, G., 2009. *Ethics in information technology.* 3rd ed. Boston, MA: Course Technology.
4. MacKinnon, B., 2008. *Ethics: theory and contemporary issues.* 6th ed. California: Wadsworth Publishing.
5. Zawiyah Mohd Yusof et al., 2005. *Teknologi maklumat & komunikasi: etika, undang-undang dan sosial*. Kuala Lumpur: McGraw Hill.
6. Occupational Safety and Health Act and Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.M34 2001 rw N2.
7. Factories and Machinery Act & Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.A31967 .A4 2001 rw N1.

BIC 21203 Web Development
Prerequisite Course(s): Taken BIC10204 Algoritma and Programming

Synopsis
This course emphasizes on the knowledge and skills in web application development. Topics includeintroduction to Internet and WWW, markup language, style sheet, client server scripting, database access through web and latest web technology.

References

1. Sebesta, R. W., 2011. *Programming the world wide web.* 6th ed. Colorado: Addison-Wesley. Call Number: XX(123808.1)

2. Bates, C., 2006. *Web programming: building Internet applications*. 3rd ed. New York: John Wiley & Sons.
3. Deitel, P. J. & Deitel, H. M., 2008. *Internet & world wide web: how to program*. 4th ed. New Jersey: Prentice Hall. Call Number: QA76.625 .D445 2008
4. Xue Bai, Ekedahl, M., Farrel, J. & Gosselin, D., 2003. *The web warrior guide to web programming*. Canada: Thomson Course Technology. Call Number: QA76.625 .W42 2003
5. Greenlaw, R. dan Hepp, E. (2002). *Fundamentals of the Internet and the world wide web*, Toronto : McGraw Hill. Call Number: TK5105.875 .I57 .G73 2002 n.1

BIC 21303 Computer Network

Prerequisite Course(s): None

Synopsis

This course emphasizes the knowledge and skills in computer networking. Topics include introducton to network and data communication, data communication, network: OSI model, network: TCP/IP model, Wide Area Network (WAN) and Internet and latest web technology.

References

1. Forouzan, B. A., 2007. *Data communications and networking.* 4th ed. New York : McGraw-Hill. Call Number: TK5105 .F67 2007
2. Kurose, J. F. & Ross, K. W., 2009. *Computer networking: a top-down approach.* 5th ed. Reading, MA: Addison Wesley
3. Comer, D. E., 2008. *Computer networks and internets.* 5th ed. Upper Saddle River, NJ: Prentice Hall.
4. Peterson, L. L. & Davie, B. S., 2011. *Computer networks: a systems approach.* 5th ed. San Francisco: Morgan Kaufmann Publishers. Call Number: XX(123371.1)
5. Stallings, W., 2011. *Data and computer communications.* 9th ed. New Jersey: Prentice Hall. Call Number: XX(132126.1)

BIC 21404 Database

Prerequisite Course(s): Taken BIC21003 System Analysis and Design

Synopsis

This course exposes students to the knowledge and skills in database. Topics include introduction to database, database concept, entity relationship modelling, database normalization, database design, syntax query language (SQL) and online database technology.

References

1. Connoly, T. & Begg, C., 2009. *Database system: a practical approach to design, implementation and management.* 5th ed. New York: Addison-Wesley
2. *Elmasri, R. & Navathe, S., 2010.* Fundamentals of database systems. *6th ed. Boston: Addison-Wesley.*
3. *Silberschatz, A., Korth, H. & Sudarshan, S., 2011.* Database system concepts. *6th ed. New York: McGraw-Hill. Call number : QA76.9.D3 .K69 2011.*
4. *Kroenke, D. M. & Auer, D., 2009.* Database concepts. *4th ed. New Jersey: Prentice Hall.*
5. *Garcia-Molina, H., Ullman, J. D. & Wixom, J., 2008.* Database system: the complete book. *2nd ed. London: Prentice Hall.*

BIC 31502 Creativity & Innovation

Prerequisite Course(s): None

Synopsis
This course helps students to develop their creative and innovative thinking skill. Topics include the concept of creativity and innovation, basic thinking tools and creative problem solving.

References

1. Bernacki, Ed. (2002). Wow! that's a great idea! : insight, idea, opportunity, action. Prentice Hall, Singapore. Call Number: HD53 .B47 2002
2. De Bono, E. (2003). Serious Creativity 1: Lateral Thinking Tools, Techniques and Application. Allscript Books, Singapore. Call Number: BF408 .D365 2003 Other references
3. Ceserani, J. & Greatwood, P. (2001). Innovation and Creativity. Creast Publishing House, New Delhi.
4. Clegg, B. & Birch, P. (2002). Crash Course in Creativity. Kogan Page, London.
5. De Bono, E. (1998). Edward De Bono Supermind Pack: Expand Your Thinking Power with Strategic & Mental Exercise. DK Publishing Incorporated.
6. Lumsdaine, E., Lumsdaine, M. & Shelnut, J. W. (1999). Creative Problem Solving and Engineering Design. McGraw-Hill, USA.
7. Tanner, D. (1997). Total Creativity. APTT Publications.

BIC31602 Degree Project I
Prerequisite Course(s): None

Synopsis
This course discusses on the research methodology of a degree project. Topics include introduction to computing projects, research, project formulation/selection, literature review, project planning and risk management, project implementation - software development, writing and presentation.

References

1. Pusat Pengajian Siswazah UTHM, 2011. Panduan menulis tesis. 4th ed. Parit Raja: Penerbit UTHM.
2. Kumar, R., 2011. Research methodology: a step-by-step guide for beginners. New Jersey: Prentice Hall, Inc. London: SAGE. (Q180.55.M4 .K85 2010).
3. Dawson, C. W., 2009. Projects in computing and information systems: a student's guide. 2nd ed. Essex Pearson Education Limited.
4. Avison, D. & Fitzgerald, G., 2008. Information systems development: methodologies, techniques and tools, 4th ed. Berkshire: McGraw Hills.
5. Avison, D. & Pries-Heje, J., 2005. Research in information systems: a handbook for research supervisors and their students. Burlington, MA: Elsevier Butterworth-Heinemann.
6. Berndtsson, M., Hansson, J., Olsson, B. & Lundell, B., 2002. Planning and implementing your final year project – with success!: a guide for students in computer science and information systems. London: Springer-Verlag.

BIC31704 Degree Project II
Prerequisite Course(s): Passed BIC31602 Degree Project I

Synopsis
This course discusses on the research methodology of a degree project. Topics include introduction to computing projects, research, project formulation/selection, literature review, project planning and risk management, project implementation - software development, writing and presentation.

Rujukan/References

1. Pusat Pengajian Siswazah UTHM, 2012. Panduan menulis tesis. 4th ed. Parit Raja: Penerbit UTHM.

BIC41812 Industrial Training

Prerequisite: Students obtained 70% of program total credit

Synopsis

This course requires students to attend a 24-weeks industrial training in any government or private agencies. Two supervisors will be appointed to each student - faculty and industry. The students will be given an assignment or a project that should be discussed and approved beforehand. At the end of this course, the projects/assignments have to be presented to both supervisors.

Rujukan/Reference

UTHM Practical Training Log Book

BPK20802 Entrepreneurship

Prerequisite Course(s): None

Synopsis

This course exposes students to the fundamental aspects of entrepreneurship and real business. Topics include introduction to entrepreneurship, the characteristics and motivations of entrepreneurs, how to look for opportunities to analyze the business environment and also developing and managing a business.

References

1. Charles E. Bamford, Garry D. Bruton (2011). Entrepreneurship: a small business approach. New York : McGraw-Hill. Call number HD62.5 .B35 2011
2. Schaper M., Volery, T, Weber, P., Lewix, K., (2011). Entrepreneurship and small busiess; 3rd Asia-Pacific Edition. John Wiley & Son. Call number HD2341 .E57 2011
3. Hisrich, R.D., Peter, M.P., Shepherd, D.A., (2010). Entrepreneurship, 8th Edition. McGraw Hill. Call number HD62.5 .H57 2010
4. Donald F. Kuratko, Richard M. Hodgetts. (2007). Entrepreneurship: theory, process, practice, 7th Edition. Mason : Thomson South-Western. Call number HB615 .K87 2007
5. John. B., Tidd. J., (2011). Innovation and entrepreneurship. 2nd Edition. Chichester, West Sussex, UK Call number HD53 .B48 2011

BIM10103 Fundamentals of Multimedia Computing

Prerequisite Course(s): None

Synopsis

This course covers the basic concept, design theory and development process of multimedia applications. Topics discussed include introduction to multimedia, multimedia authoring and development, graphics and color, audio, video, animation, text and typography, visual and interactivity design, scripting and professional issues in multimedia development. Additionally, students will have the opportunity to acquire skills in using latest authoring and multimedia application development software.

References

1. Chapman, N. & Chapman J., 2009. *Digital multimedia*. 3rd Edition, London: John Wiley & Sons. Call number: QA76.575 .C53 2009.
2. Savage, T. M. & Vogel, K. E., 2009. *An introduction to digital multimedia*. Sudbury, MA: Jones and Bartlett Publishers.
3. Musburger, R. B. & Kindem, G., 2009. *Introduction to media production: the path to digital media production*. 4th ed. Oxford: Focal Press.
4. Yue-Ling, W., 2009. *Digital media primer.* Upper Saddle River: Pearson Education. Call number: QA76.575 .W66 2009

5. Ze-Nian, L. & Drew M. S., 2004. *Fundamentals of multimedia.* Upper Saddle River: Pearson Education.
6. Stallings, W. (2010). *Data and Computer Communications*, 9th ed., New Jersey: Pearson Prentice Hall.
7. Jeffrey. C. J. (2007). Web Technologies: A Computer Science Perspective, NJ: Prentice Hall.

BIM10203 Digital Audio and Video Technology

Prerequisite Course(s): Taken BIM10103 Fundamentals of Multimedia Computing

Synopsis

This course covers the digital audio and video technology. Topics include introduction to audio and video, audio and video production, digital video data representation and communication, video signal and interface, digital audio representation, introduction to audio and video processing and, audio and video standards.

References

1. Zettl, H., 2010. *Video basics.* 6th ed. Boston, MA: Wadsworth. Call Number: TR882.5 .Z47 2010.
2. Paul, S., 2011. *Digital video distribution in broadband, television, mobile and converged networks: trends, challenges and solutions*. Chichester: John Wiley. Call Number: TK5105.15 .P38 2011.
3. Schaefermeyer, S., 2007. *Digital video basics*. Hoboken, NJ: Wiley. Call Number: TR860 .S32 2007
4. Weise, M. & Weynand, D., 2007. *How video works: from analog to high definition.* 2nd ed. Burlington, MA: Focal Press. Call Number: TK9961 .W44 2007.
5. Hanzo, J., 2007.*Video compression and communication: from basics to H.261, H.263, H.264, MPEG4 for DVB and HSDPA-style adaptive turbo-transceivers*. Hoboken, NJ: J. Wiley and Sons. Call Number: TK6680.5 .H36 2007.

BIM20303 Computer Graphics and Animation

Prerequisite Course(s): None

Synopsis

This course covers the basic principles and features of computer graphics and animation. Topics discussed include introduction to computer graphics, basic principle of two-dimensional (2D) graphics, line and curve, area, text and color, basic principle of three-dimensional (3D) graphics, three-dimensional object modeling, real surface identification, illumination and shading, special effects and virtual reality. Additionally, students will have the opportunity to acquire skills in the design and development of computer graphics and animation either in 2D or 3D using a graphic programming language.

References

1. Klawonn, F., 2008. *Introduction to computer graphics using Java 2D and 3D*. 2nd. London: Springer-Verlag. T385 .K53 2008
2. Burger, W. & Burge, M. J., 2008. *Digital image processing: an algorithmic introduction using Java*. New York: Springer. TA1637 .B88 2008
3. Hofele, C., 2007. *Mobile 3D graphics: learning 3D graphics with the Java micro edition.* Boston, MA: Thomson Course Technology. QA76.73.J38 .H63 2007.
4. Zhang, K. & Ammeraal, L., 2007. *Computer graphics for Java programmers.* 2nd ed. West Sussex: John Wiley & Sons. T385 .A55 2007
5. Chen, J.X., 2006. *Foundations of 3D graphics programming using JOGL and Java 3D*. London: Springer-Verlag. T385 .C44 2006

BIM20404 Multimedia System and Application

Prerequisite Course(s): None

Synopsis

This course discusses the multimedia system and its application. Topics include introduction to multimedia system and application, multimedia system and hardware, multimedia communication and network, multimedia database system, multimedia programming, multimedia security, hypermedia and hypertext document, multimedia learning and multimedia application. Additionally, students will have the opportunity to develop skills in using latest multimedia application development software.

References

1. Rao, K. R., Bojkovic, Z. S. & Milovanovic, D. A., 2006. *Introduction to multimedia communications: application, middleware, networking.* Hoboken, NJ: John Wiley & Sons. Call number: TK5105.15 .R36 2006.
2. Steinmetz, R. & Nahrstedt, K., 2004. *Multimedia systems*. New York: Springer Verlag.
3. Steinmetz, R. & Nahrstedt, K., 2004. *Multimedia applications*. New York: Springer Verlag.
4. Burg, J., 2009. *The science of digital media*. New Jersey: Pearson Education International.
5. Ze-Nian, L. & Drew M. S., 2004. *Fundamentals of multimedia.* New Jersey: Prentice Hall.

BIM30503 Human-Computer Interaction

Prerequisite Course(s): None

Synopsis

This course discusses the interaction between human and computer through a user interface design. Topics include introduction to human-computer interaction, user factors, computer and interaction between human and computer, design process and prototype, interaction design, evaluation technique and human support. Additionally, students will have the opportunity to develop skills in designing an effective user interface using appropriate software based on case studies.

References

1. Smith-Atakan, S., 2008. *Human computer-interaction*. London: Thomson Learning. QA76.9.H85.S64 2006
2. Shneiderman, B., Plaisant, C., Cohen, M. & Jacobs, S., 2009. *Designing the user interface: strategies for effective human-computer interaction.* 5th ed. Boston: Addison Wesley. QA76.9.H85 .S56 2005
3. Sharp, H., Rogers, Y. & Preece, J., 2007. *Interaction design: beyond human-computer interaction.* 2nd ed. West Sussex: John Wiley & Sons. QA76.9.H85 .P73 2007
4. Dix, A., Finlay, J. & Abowd, G., 2004. *Human-computer interaction*, 3rd ed. Essex: Pearson Education. QA76.9.H85 .H85 2004
5. Te'eni, D., Carey, J. & Ping, Z., 2007. *Human computer interaction : developing effective organizational information systems.* Hoboken, NJ : John Wiley. QA76.9.H85 .T44 2007

BIM30603 Mobile Application Development

Prerequisite Course(s): None

Synopsis

This course focuses on the application development for mobile device. Topics include basic mobile computing, mobile application design, mobile programming, memory management, application and services, mobile commerce and technology growth in mobile computing.

References

1. Mikkonen, T., 2007. Programming mobile devices: An introduction for practitioners. New Jersey: Wiley. QA76.59 .M54 2007

2. Leggett, R., Janousek, S., & de Boer, W., 2006. Foundation flash applications for mobile devices. Berkeley: Friends of ED.
3. Adelstein, F., Gupta, S. K., Richard III, G. & Schwiebert, L., 2005. Fundamentals of mobile and pervasive computing. London: McGraw-Hill. TK5103.2 .F86 2005
4. Knudsen, J. & Li, S., 2005. Beginning J2ME: from novice to professional. 3rd ed. New Jersey: Apress.
5. Head, M & Li, E. Y., 2009. Mobile and ubiquitous commerce: advanced e-business methods. Hershey, PA: Information Science Reference.

BIM30703 Multimedia Project Management

Prerequisite Course(s): None

Synopsis

This course focuses on the multimedia project management. Topics include context of interactive media project, starting the interactive media project, group management, stakeholders and the influences, partnership approach for developers/customers, problem solving on project development, user contributions, testing and archiving, legal issues, intellectual property and marketing.

References

1. England, E. & Finney, A., 2007. Managing interactive media: project management for web and digital media. 4th ed. Essex: Addison Wesley. Call Number: QA76.575 .E53 2007.
2. Frick, T., 2007. Managing interactive media projects. Clifton Park, NY: Delmar Cengage Learning. Call Number: QA76.76.I59 .F74 2008.
3. England, E. & Finney, A., 2002. Managing interactive media: project management for web and convergent media. 3rd ed. Essex: Addison Wesley. Call Number: QA76.575 .E53 2007.
4. Dawson, C. W., 2009. Projects in computing and information systems: a student's guide. 2nd ed. Essex: Addison Wesley. Call Number: QA76 .D38 2005
5. Hughes, B. & Cotterell, M., 2009. Software project management. 5th ed. Berkshire: McGraw Hill. Call Number: QA76.76 .C67 2002 N1.

BIM30803 Virtual Reality

Prerequisite Course(s): Taken BIM20303 Computer Graphics and Animation

Synopsis

This course emphasizes the knowledge and skills in virtual reality system development. Topics include introduction to virtual reality, virtual reality development methodology, basics of virtual reality: graphic, computer animation, virtual environment, perception and experience: visual, audio, touch, smell and taste, mixed reality and issues in virtual reality.

References

1. Gutierrez, M., Vexo, F. & Thalmann, D., 2008. Stepping into virtual reality. London: Springer-Verlag. Call number: QA76.9.H85 .G87 2008.
2. Craig, A.B., Sherman, W.R. & Will, J.D, 2009. Developing Virtual Reality Applications: Foundations of Effective Design. Morgan-Kaufmann.
3. McMenemy, K. & Ferguson, S., 2007. A hitchhikers guide to virtual reality. Wellesley, MA: A K Peters
4. Kim, G. J., 2005. Designing virtual reality systems: the structured approach. London: Springer-Verlag.
5. Vince, J., 1995. Virtual Reality Systems. Pearson Prentice Hall.

BIM33003 Rich Internet Application Development

Prerequisite Course(s): Taken BIC21203 Web Development

Synopsis

This course emphasizes the knowledge and skills in designing and developing rich-context Internet application. Topics include the basic of rich Internet application (RIA), RIA's system and technology, user interface component, application appearance and component, media for RIA, RIA's widget, RIA's usage, data manipulation and issues in RIA.

References

1. Moore, D., Budd, R. & Benson, E., 2007. Professional rich Internet application: AJAX and beyond. Indianapolis: Wiley. TK5105.8885.A52.M66 2007
2. Labriola, M., Tapper, J. & Boles, M., 2010. Adobe Flex 4: training from the source. Berkeley, CA: Adobe. QA76.625.L32 2010
3. Gassner, D., 2010. Flash builder 4 and flex 4 bible. Indianapolis: Wiley Pub., Inc. QA76.625.G37 2010
4. DiMarzio, J. F., 2011. JavaFX: a beginner's guide. New York: McGraw-Hill. QA76.73.J38.D55 2011
5. Topley, K., 2011. JavaFX developer's guide. Upper Saddle River: Addison-Wesley. QA76.73.J38.T66 2011

BIM33103 Computer Games Development

Prerequisite Course(s): Taken BIM20303 Computer Graphics and Animation

Synopsis

This course provides the knowledge and skills in developing computer games. Topics include basic principle of computer games, games design, games architecture, two-dimensional games, three-dimensional games, games programming and special issues in computer games.

References

1. Harbour, J. S., 2010. Multi-threaded game engine design. Boston, MA: Course Technology.QA76.76.C672 .H376 2011
2. Gregory, J., Lander, J. and Whiting, M., 2009. Game engine architecture. Wellesly, MA: A K Peters, Ltd. XX(129740.1)
3. Rollings, A. & Morris, D., 2004. Game architecture and design: a new edition. Indiana: New Riders Publishing. QA76.64 .R64 2004
4. Miller, T., 2005. Beginning 3D game programming. Indiana: Sams Publishing. QA76.76.C672 .M54 2005
5. Morrison, M., 2007. Beginning game programming. Indiana: Sams Publishing. QA76.76.C672 .H375 2007

BIM33203 Image Processing

Prerequisite Course(s): Taken BIM20303 Computer Graphics and Animation

Synopsis

This course discusses the image features and characteristics and image processing method and techniques. Topics include basic image processing, image transformation, image improvement and recovery, image compression, image segmentation, image feature extraction, object recognition and image processing application.

References

1. Gonzalez, R. C. & Woods, R. E., 2008. Digital image processing,3rd ed. Reading: Addison-Wesley. TA1632 .G66 2008

2. Gonzalez, R. C., Woods, R. E. & Eddins, S. L., 2011. Digital image processing using Matlab. 2nd ed. Knoxville, TN: Gatesmark Publishing.
3. Nixon, M. & Aquado, A. S., 2008. Feature extraction & image processing. 2nd ed. Oxford: Academic Press. TA1637.N59 2008
4. Solomon, C. & Breckon, T., 2011. Fundamentals of digital image processing: a practical approach with examples in Matlab. Hoboken, NJ: Wiley-Blackwell. TA1637.S65 2011
5. Burger, W. & Burge, M. J., 2008. Digital image processing: An algorithmic introduction using Java. New York: Springer. TA1637 .B88 2008

BIM33303 Digital Media Processing

Prerequisite Course(s): Taken BIM20303 Computer Graphics and Animation

Synopsis

This course covers the digital audio and video processing. Topics include data processing, digital signal processing, digital audio processing, digital video processing and digital media processing application.

References

1. Moeslund, T.B., 2012. Introduction to video and image processing: building real systems and applications. New York: Springer.
2. Mukhopadhyay, J., 2007. Image and video processing in the compressed domain. Boca Raton, F: CRC Press. http://www.crcnetbase.com/isbn/978-1-4398-2936-3.
3. Bovik, A. C., 2005. Handbook of image and video processing. Boston: Elsevier. Call Number: TA1637 .H36 2005 r.
4. Guan, Ling., 2000. Multimedia image and video processing. Boca Raton, FL: CRC Press. Call Number: QA76.575 .M853 2000 N1.
5. Wang, Yao., Ostermann, J., and Zhang, Ya-Qin., 2002. Video processing and communications. Upper Saddle River, NJ: Prentice Hall. Call Number: TK5105.2 .W36 2002 N1.

BIM33403 Multimedia Security Technology

Prerequisite Course(s): Taken BIC21303 Computer Network

Synopsis

This course provides knowledge on multimedia information security's technique and technology. Topics include introduction to information security, information security concept, multimedia security concept, multimedia security technique and legislation and standards.

References

1. Zeng, W., Yu, H., & Lin, C. Y., 2006. Multimedia security technologies for digital rights management. Burlington, MA: Academic Press. (QA76.9.A25 .M84 2006)
2. Lu, C. S., 2004. Multimedia security:Steganography and digital watermaking techniques for protection of intellectual property. Hershey, PA: Idea Group Publishing.
3. Kipper, G., 2003. Investigator's guide to steganography. Florida: CRC Press
4. Cox, I. et al., 2004. Digital watermarking and steganography. 2nd ed. Burlington, MA: Morgan Kaufmann. (QA76.9.A25 .D53 2008)
5. Johnson, N. F., Duric, Z., & Jajodia, S., 2000. Information hiding: steganography and watermarking - attacks and countermeasures. Massachusetts: Springer.

BIM33503 Data Visualization

Prerequisite Course(s): Taken BIM20303 Computer Graphics and Animation

Synopsis
This course emphasizes the knowledge and skills related to data visualization concept and its application. Topics include the basics of visualization, human perceive and perception, representation and overview, presentation and design principal, image and words, interaction and system and application.

References

1. Ware, C., 2004. Information visualization: Perception for design. 2nd ed. San Francisco: Morgan Kaufman Inc. Call Number: TS156.2 .W38 2004.
2. Spence, R., 2007. Information visualization: Design for interaction. 2nd ed. Essex: Prentice Hall. Call Number: TK7882.I6 .S63 2007.
3. Chen, C., 2006. Information visualization, beyond the horizon. London: Springer-Verlag.
4. Schroeder, W., Martin, K., & Lorensen, B., 2006. The visualization toolkit an object-oriented approach to 3D graphics. 4th ed. New York: Kitware, Inc.
5. Card, S., Mackinlay, J., & Shneiderman, B., 1999. Readings in information visualization: Using vision to think. San Francisco: Morgan Kaufmann Publishers. Call Number: TK7882 .I6 .C37 1999 N1.

BIM33603 Special Topics in Multimedia Computing

Prerequisite Course(s): None

Synopsis
This course focuses on research in technology transfer and new findings in multimedia computing. Additionally, this course requires students to have direct involvement in the discussion either in the classroom or newsgroup/online forum. Topics include current issues and challenge in multimedia computing.

References

1. Li, Q. & Shih, T. K. eds., 2010. Ubiquitous multimedia computing. Boca Raton, FL: CRC Press. QA76.575 .U34 2010.
2. Sasaki, H. ed., 2008. Intellectual property protection for multimedia information technology. Hershey, PA: Information Science Reference. QA76.575 .S27 2008.
3. Zhang, Y. eds., 2008. Broadband mobile multimedia: techniques and applications. Boca Raton, FL: Taylor & Francis. QA76.59 .B76 2008.
4. Lytras, M. D. & Naeve, A. eds., 2007. Ubiquitous and pervasive knowledge and learning management: semantics, social networking and new media to their full potential. Hershey, PA: Idea Group. QA76.5915 .U25 2007.
5. Furht, B. ed., 2006. Encyclopedia of multimedia. New York: Springer. QA76.575 .E62 2006 re.

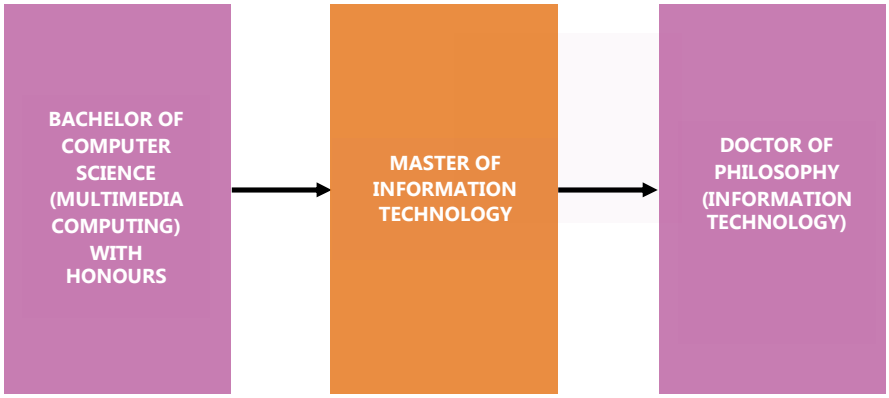
Career and Further Education Prospect

With a Bachelor of Computer Science in Multimedia Computing, the student may pursue various professional web careers including:

- Multimedia Content Designer
- Multimedia Content Developer
- Interactive Media Developer
- Mobile Application Developer
- Multimedia Programmer
- Multimedia Specialist
- Web Designer
- Web Developer
- Game Developer
- Creative Director
- Academicians

and many other Multimedia or Computer Science related jobs. These jobs are said to be the fastest growing occupation in the next decade. Students also can further their study in Master of Computer Science by research, coursework or mix-mode in related higher learning education institution.

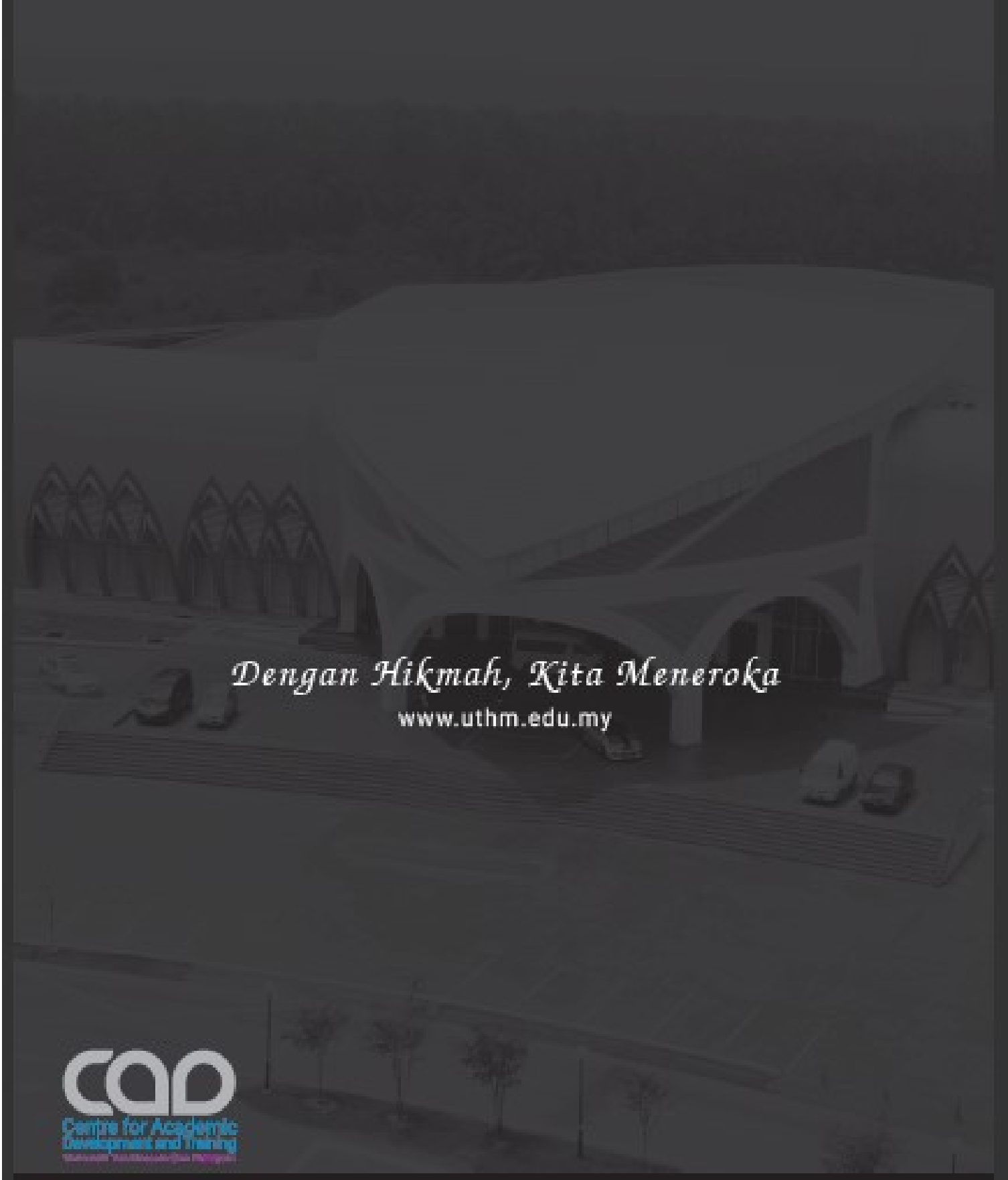
Further Education Pathway



MALAYSIAN QUALIFICATIONS FRAMEWORK: QUALIFICATIONS AND LEVELS

MQF Levels	Sectors			Lifelong Learning
	Skills	Vocational and Technical	Higher Education	
8			Doctoral Degree	Accreditation of Prior Experiential Learning (APEL)
7			Masters Degree	
			Postgraduate Certificate & Diploma	
6			Bachelors Degree	
			Graduate Certificate & Diploma	
5	Advanced Diploma	Advanced Diploma	Advanced Diploma	
4	Diploma	Diploma	Diploma	
3	Skills Certificate 3	Vocational and Technical Certificate	Certificate	
2	Skills Certificate 2			
1	Skills Certificate 1			

Source: Malaysian Qualification Framework



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