Universiti Tun Hussein Onn Malaysia
86400 Batu Pahat, Johor

Academic Proforma 2012/2013

Bachelor of Computer Science (Software Engineering) with Honours

Faculty of Computer Science and Information Technology

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Universiti Tun Hussein Onn Malaysia
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Welcoming Address from the Vice Chancellor

Assalammualaikum Warahmatullahi Wabarakatuh and Warm Greetings

I would like to take this opportunity to welcome the new students of Academic Session 2012/2013 to Universiti Tun Hussein Onn Malaysia (UTHM). Thank you for your interest in pursuing further studies for a success and better life. You should be thankful for being fortunate in comparison to other friends whom do not have the chance to continue their studies in an institution of higher learning. Therefore, utilize this good opportunity to instill the spirit and will power in pursuing knowledge for the success and prosperity of oneself, family, religion, race and the Nation.

UTHM is determined to be one of the well-known higher learning institutions in the Nation and and worldwide. Having well-planned academic system whilst supported with the latest and modern teaching and learning facilities, UTHM is capable of producing excellent graduates to meet the needs of national workforce.

As one of the Public Higher Learning Institutions in the country, UTHM offers a variety of academic programmes at Diploma, Bachelor, Master and Doctorate levels. UTHM is the best choice for science, technology and engineering courses. UTHM also offers courses in the fields of technology management, information technology, and technical and vocational education. The academic programmes of UTHM focus on student-centered hands-on aspect to ensure that the knowledge and skills acquired can be readily applied especially in national industries. High quality co-curricular programmes will provide you the opportunity to strengthen on your honorable personality and competence.

I put my trust that you will become a member of the University that will continue the excellent tradition of the University in becoming graduates whom are capable in applying and translating the science, engineering and technology knowledge in accordance with the national needs.

Wishing You Success

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

Welcoming Address from the Deputy of Vice Chancellor (Academic and International)

Assalammualaikum Warahmatullahi Wabarakatuh and Warm Greetings

I would like to take this opportunity to express my warmest congratulations and well done to you as the new students whom have successfully been selected to pursue studies at Universiti Tun Hussein Onn Malaysia for this 2012/2013 session.

I would also like to congratulate the Centre for Academic Development for successfully publishing the proforma which will serve as the students guide in planning the learning beginning the first semester till the completion of studies at this University.

Detailed planning and effective implementation in each semester coupled with preparedness before attending the lectures are very important to ensure you are prepared for the learning process. In addition, preparedness for the co-curricular programmes also is important to ensure that the knowledge gained is beneficial and helps in upholding your profession in the future.

I hope the publication of this proforma can be fully utilised in planning for your learning in this University and you are able to make the best decision in achieving success with flying colours.

Last but not least, I would like to wish All the Best and pray that you will be successful in your studies at this University and thus be able to contribute towards talented human capital for the development of the religion, society and Nation.

Thank you.

Profesor Ir. Dr. Abdul Aziz bin Dato' Abdul Samad
Deputy of Vice Chancellor (Academic and International)
Universiti Tun Hussein Onn Malaysia

Welcoming Address from the Dean of Faculty of Computer Science and Information Technology

Assalammualaikum Warahmatullahi Wabarakatuh and Warm Greetings

First and foremost, I would like to welcome the new students to Faculty of Computer Science and Information Technology (FSKTM) for academic session of 2012/2013. As new student at FSKTM, I would like to offer my heartiest congratulations to each one of you for being selected as student at UTHM and at FSKTM, specifically.

In realising UTHM mission and vision to produce graduates whom are creative and of high quality, FSKTM is offering various courses. These courses are offered in consideration of the market research conducted for the field of Computer Science and Information Technology. You will be exposed to learning and teaching covering the theory and practical in the field of Computer Science and Information Technology including educational visit to IT industries and industrial attachment.

At the moment, FSKTM has four (4) departments, i.e. Department of Software Engineering, Department of Multimedia, Department of Information Security, and Department of Web Technology. Through these four (4) departments, five (5) Bachelor programmes, four (4) Master by mix-mode programmes, one (1) Master by research programme and one (1) Doctorate of Philosophy (PhD) programme are offered.

With the Bachelor programmes offered by FSKTM, you should take the opportunity to work hard so that the goals of parents, industry and nation can be achieved. Systematic learning planning coupled with good preparation throughout your studies will produced excellent graduates. You should be ambitious in academic as well as self development.

Last but not least, congratulations and all the best!

Thank you.

Prof. Dr. Rosziati binti Ibrahim
Dean
Faculty of Computer Science and Information Technology
Universiti Tun Hussein Onn Malaysia

Vision

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

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

Direction

Developing a future sustainable technological university

Education Philosophy of University

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

Logo of the University

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
Circle	Resilience and its relation to global characteristics
Shield	Confidence

University Board of Directors

Chairman

Tan Sri Dato' (Dr.) Ir. Jamilus bin Md Hussin
Chairman
KLIA Premier Holdings Sdn. Bhd.

Members

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Vice-Chancellor
Universiti Tun Hussein Onn Malaysia

Dato' Sri Sufri bin Hj Mohd Zin
Executive Chairman
TRC Synergy Berhad

Major General (R) Dato' Md. Ismail bin Ahmad Khan
Managing Director
TALHIS-K Sdn. Bhd.

Dato' Abd. Shukor bin Ibrahim
Project Manager
e-Procurement Unit
Ministry of Finance Malaysia

Dato' Ir. Hj. Wahab bin Suhaili
Chairman
Wahba Group Sdn. Bhd.

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Ministry of Higher Education

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Professor Ir. Dr. Hj. Abas bin Abdul Wahab
Professor Faculty of Mechanical and Manufacturing Engineering,
Universiti Tun Hussein Onn Malaysia

Mr. Jamalulail bin Abu Bakar
Director
Division of Student Affair and Development
Ministry of Higher Education Malaysia

Secretary

Tuan Haji Sulam bin Hamid
Registrar

Senate Members

Chairman

Professor Dato' Dr. Mohd. Noh bin Dalimin
Vice Chancellor

Members

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Deputy Vice Chancellor (Academic and International)

Professor Dr. Wahid bin Razzaly
Deputy Vice Chancellor (Research and Innovation)

Professor Ir. Dr. Amir Hashim bin Mohd Kassim
Assistant Vice Chancellor (Student Affairs and Alumni)

Professor Dr. Hashim bin Saim
Assistant Vice Chancellor (Industry and Community Relations)

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Dean Faculty of Electrical and Electronic Engineering

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Dean Faculty of Technology Management and Business

Dr. Razali bin Hassan
Acting Dean Faculty of Technical and Vocational Education

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Dean Faculty of Computer Science and Information Technology

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Dean Faculty of Science, Technology and Human Development

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

Professor Ab. Aziz bin Abd. Latiff
Dean Centre for Diploma Studies

Dr. Sh Salleh bin Sh Ahmad
Dean Centre for Academic Development

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Director Centre for Co-Curriculum and Culture

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Faculty of Mechanical and Manufacturing Engineering

Professor Ir. Dr. Saparudin bin Ariffin
Faculty of Mechanical and Manufacturing Engineering

Professor Ir. Dr. Hj. Abas bin Ab Wahab
Faculty of Mechanical and Manufacturing Engineering

Professor Dr. Hj. Sulaiman bin Yamin
Faculty of Technical and Vocational Education

Professor Dr. Wan Mohd Rashid bin Wan Ahmad
Faculty of Technical and Vocational Education

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

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Director Strategic and Quality Management Office

Associate Professor Dr. Abd Halid bin Abdullah
Director Development and Property Management Office

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Acting Bursar

En. Bharun Narosid bin Mat Zin
Chief Librarian

Tn. Hj. Sulam bin Hamid
Registrar / Secretary

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Principal Researcher
Advanced Analysis and Modelling (ADAM)
Mimos Bhd.

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School of Information Technology
Faculty of Science Technology
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Faculty External Examiner

Prof. Dr. Abdul Razak Hamdan
Faculty of Technology and Information Science
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Faculty Industrial Advisors

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National Technology Officer
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E2B Consulting Sdn. Bhd.

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En. Nathan M. Balakrishnan
Senior Software Engineer
MIMOS Berhad

Faculty of Computer Science and Information Technology

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 Figure 1.

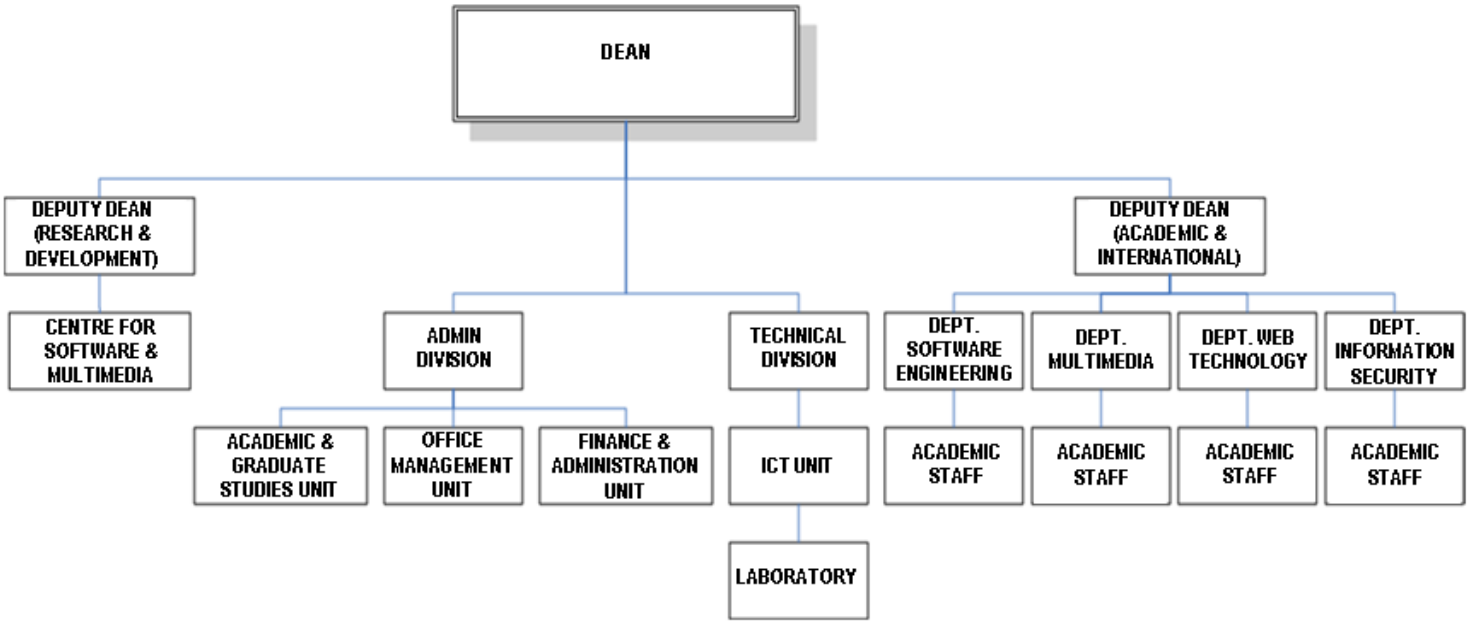

Figure 1. Organisation chart of Faculty of Computer Science and Information Technology

Directory of Faculty of Computer Science and Information Technology (FSKTM) Staff

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Curriculum of Bachelor of Computer Science (Software Engineering) with Honours

Table 1. Summary of curriculum for Bachelor of Computer Science (Software Engineering) with Honours

Year	Semester	Code of courses	Courses	Credit	Total
1	I	UWB10102	Academic English	2	17
		UWB10x02	Foreign Language	2	
		UWA10102/UWA10202	Islamic Studies/ Moral Studies	2	
		UQ*1xxx1	Co-Curriculum I	1	
		BIC10103	Discrete Structure	3	
		BIC10204	Algorithms and Programming	4	
		BIC10303	Algebra	3	
	II	UWA10302	Islamic and Asian Civilisations	2	18
		UWB10202	Effective Communication	2	
		UQ*1xxx1	Co-Curriculum II	1	
		BIC10404	Data Structures	4	
		BIC10503	Computer Architecture	3	
		BIC10603	Statistics	3	
		BIE10103	Principles of Software Engineering	3	
	III	BIC10703	Computing Skills	3	6
		BIE10203	Software Process	3	
2	I	UWB20302	Technical Writing	2	18
		UWS10103	Nationhood and Current Development of Malaysia*	3	
		BIC20803	Operating Systems	3	
		BIC20904	Object Oriented Programming	4	
		BIC21003	Systems Analysis and Design	3	
		BIE20303	Algorithms and Complexity	3	
	II	UWS10202	Ethnic Relations**	2	18
		BIC21102	Professional Ethics and Occupational Safety	2	
		BIC21203	Web Development	3	
		BIC21303	Computer Networks	3	
		BIC21404	Database	4	
		BIE20404	Visual Programming	4	
3	I	BIC31502	Creativity and Innovation	2	18
		BPK20802	Entrepreneurship	2	
		BIM30503	Human-Computer Interaction	3	
		BIE30603	Modelling and Needs Analysis	3	
		BIE30503	Software Project Management	3	
		BIC31602	Bachelor Degree Project I	2	
		BIE33x03	Elective I	3	
	II	BIE30703	Sofware Quality Assurance	3	16
		BIC31704	Bachelor Degree Project II	4	
		BIE33x03	Elective II	3	
		BIE33x03	Elective III	3	
		BIE33x03	Elective IV	3	
4	I	BIC41812	Industrial Training	12	12
				Overall Total Credit	**123**

*For international students, this course will be replaced by UWB11202 Malay Language.
**For international students, this course will be replaced by UWS10303 Malaysian Studies and Culture.

Table 2. List of elective courses in Bachelor of Science (Software Engineering) with Honours

Field	Code of courses	Elective course	Credit
Software Engineering	BIE33003	Software Engineering Security	3
	BIE33103	DotNet Programming	3
	BIE33203	Distributed Systems	3
	BIE33303	Real-Time Systems Application	3
	BIE33403	Formal Methods	3
	BIE33503	Special Topics in Software Engineering	3

Year 1 Semester I

Classification	Code	Course	Credit
University Compulsory Courses	UWB10102	Academic English	2
	UWA10102/10202	Islamic Studies/Moral Studies	2
	UMB1xx02	Foreign Language	2
		French Language	
		German Language	
		Japanese Languange	
		Mandarin Language	
		Malay Language	
		Spanish Language	
		Arabic Language	
		Javanese Language	
	UQ*1xx01	Co-Curriculum I	1
Programme Core Courses	BIC10103	Discrete Structure	3
	BIC10204	Algorithms and Programming	4
	BIC10303	Algebra	3
		Total Credit	17

UWB10102 Academic English

Synopsis

This course focuses on fulfilling students' academic requirements such as the acquisition of reading, writing, listening and speaking skills in English. The course also concurrently provides opportunities for students to acquire basic grammar knowledge to complement the acquisition of English language. Students will be reinforced on aspects of English language oral and written skills that are most relevant to them in their academic work. By the end of the course, students should be able to use English for a wide range of academic activities.

References

1. Abd. Aziz, A et al. (2005). *English for Academic Communication*. Kuala Lumpur: McGraw Hill Malaysia. Call no.: PE1128.A2 .E53 2005
2. Koh, S.L. (2005). *MUET Moments: Malaysia University English* Test. Selangor: Pearson. Call no.: PE1128 .K63 2005
3. Richards, C. (2009). *Longman Text MUET: A Strategic Approach*. Petaling Jaya: Pearson Malaysia. Call no.: PE1128 .K97 2009
4. Kaur, H. (2005). *Explore MUET*. Kuala Lumpur: Fajar Bakti Sdn. Bhd.

UWA10102 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. Ismail Haji Ali, (1995), *Pengertian dan Pegangan Iktikad yang benar: Ahli Sunnah Wal Jamaah:* Kuala Lumpur: Penerbitan al-Hidayah. [BP166.78. P46 1995]
3. Mustafa Abdul Rahman (1998), *Hadith 40*, Kuala Lumpur: Dewan Pustaka Fajar. [BP135. A2 M87 1998]
4. Mustafa Haji Daud (1989), *Institusi Kekeluargaan Islam*, Kuala Lumpur: Dewan Pustaka dan Bahasa. [BP188.3. F3.M87 1989]
5. Paizah Haji Ismail (1991), *Undang-undang Jenayah Islam*, Kuala Lumpur: Dewan Pustaka Islam, Angkatan Belia Islam Malaysia. [BP144. P35 1991]

UWA10202 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. Eow Boon Hin. (2002). *Moral Education*. Longman. (LC268 .E48 2008)
2. Ahmad Khamis. (1999). *Etika Untuk Institusi Pengajian Tinggi*. Kuala Lumpur: Kumpulan Budiman. (LC315.M3 .A35 1999)
3. Mohd Nasir Omar. (1986). *Falsafah Akhlak*, Penerbit Universiti Kebangsaan Malaysia / 2010, Bangi. (BJ1291 .M524 2010).
4. Hussain Othman. (2009). *Wacana Asasi Agama dan Sains.* Batu. Pahat: Penerbit UTHM. (BL240.3 .H87 2009 a)

5. Hussain Othman, S.M. Dawilah Al-Edrus, Berhannudin M. Salleh, Abdullah Sulaiman, (2009). *PBL Untuk Pembangunan Komuniti Lestari*. Batu Pahat: Penerbit UTHM. (LB1027.42 .P76 2009 a)

UWB10602 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, 1995. *Le Nouveau Bescherelle Complete Guide 12 000 French Verbs*. Paris: Librairie Hatier.
5. Kaneman-Pougatch, Massia et al, 1997. *Méthod de français: Café Crème 1*. Paris: Hachette F.L.E.
6. Grégoir, Maïa et al, 1995. *Grammaire Progressive du Français* avec 500 exercices. Paris: CLE International.
7. Miquel, Claire Leroy et al, 1995. *Vocabulaire Progressive du Français* avec 250 exercices. Paris: CLE International.
8. Capelle, Guy et Gidon, Noëlle, 1995. *Méthod de français: Le Nouvel Espaces 1*. Paris: Hachette F.L.E.
9. Hatier. 2002. *Le Nouveau Bescherelle 12,000 French Verbs. English Edition*. Paris: Librairie Hatier.
10. French Dictionary 1999. *The New Collins Robert* 5th ed. Paris: Harper Collins Publishers.

UWB10702 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)

UWB10802 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. M. Rajendran, (1991) *Malay Japanese English Dictionary*, Petaling Jaya: Pelanduk Publications. (PL5125 .R34 1991rd).
2. Rosmahalil Azrol Abdullah, (2008) : *Bahasa Jepun* (UMJ 1312): *Learning Module* (2nd Edition), Batu Pahat. Penerbit UTHM. (PL539.3 .R67 2008a).
3. Surie Network, (2000). *Minna no Nihongo: Kaite Oboeru, Tokyo*: 3A Corporation. (PL539.3 .M56 2000)
4. Surie Network, (1998). *Minna no Nihongo: Main Textbook - Shokyu 1*, Tokyo: 3A Corporation. (PL539.3 .M574 1998)
5. Surie, Network (2010). *AE Minna no Nihongo 1-1 Elementary*: Main Textbook, Tokyo: 3A Corporation. (TK7885.7 .V44 2000r)
6. Surie, Network (2009). *AE Minna no Nihongo 1-1 Elementary: Translation and Grammatical Notes*, Tokyo: 3A Corporation. (PL539.3 .M567 2009)
7. Surie, Network (2009). *AE Minna no Nihongo 1-2 Elementary: Main Textbook*, Tokyo: 3A Corporation. (PL539.3 .M569 2009)
8. Surie, Network (2010). *AE Minna no Nihongo 1-2 Elementary: Translation and Grammatical Notes*, Tokyo: 3A Corporation. (PL539.3 .M57 2010)
9. The AOTS, (1977). *Shin Nihongo no Kiso*: Japanese Kana Workbook, Tokyo: 3A Corporation. (PL539.3 .S54 1977)
10. 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)

UWB10902 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. Liping Jiang (2006). *Experiencing Chinese.* China: Higher Education Press. (PL1129.E5 .T59 2006)
3. Kang Yuhua (2005). *Conversational Chinese 301*. China: Beijing Language and Culture University Press. (PL1121.C5 .K36 2005)
4. Kang Yuhua (2007). *Conversational Chinese 301:Vol. 2*. China:Beijng Language and Culture University Press. (PL1121.C5 .K364 2007)
5. Liu Xun (2010). *New Practical Chinese Reader: Textbook*. China: Beijing Language and Culture University Press. (PL1129.E5 .L58 2010)

UWB11002 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. Asmah Hj. Omar (1985). *Kamus Ayat*. Eastview. PL5091 .A85 1985 rd
2. Asmah Hj. Omar (1993). Susur Galur Bahasa Melayu. DBP: KL. PL5127 .A85 1993 N1
3. Asmah Hj. Omar (1993). *Nahu Melayu Mutakhir*. DBP: KL. PL5137 .A85 1993
4. Ainun Mohd (2011). *Tesaurus Bahasa Melayu*. PTS Professional Publishing. PL5123 .A364 2011
5. Nik Safiah Karim (2008). *Tatabahasa Dewan*. DBP. PL5108 .T37 2008 r
6. Kamaruddin Saad (2009). *105 karangan bahasa melayu UPSR*. Minerva Publishing. PL 5108 KAM 2009

UWB11102 Spanish Language

Synopsis

This course is designed for students to learn basic Spanish 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 Spanish language.

References

1. Nurul Sabrina Zan, (2010). *Hola! Hablo español* First Edition Batu Pahat: Penerbit UTHM. PC4445 .N72 2010 a
2. Salina Husain, (2005). *Vamos a aprender español lengua extranjera* Batu Pahat: Penerbit UTHM. PC4121 .S24 2005 a
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)

UWB11202 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. Mohd Hisyam bin Abdul Rahim. 2005. *Senang Berbahasa Arab*. Batu Pahat: Penerbit KUiTTHO. (PJ6115 .M44 2005 a)
3. Ab. Halim Mohammed; Rabiyah Hajimaming; Wan Muhammad Wan Sulong. 2007. *Bahasa Arab Permulaan.* Serdang: Penerbit UPM. (PJ6065 .A32 2007)
4. Fuad Ni'mat. 1973. *Mulakhass qawa'id al-lughatul 'arabiyyah*. Damsyik: Darul Hikmah. (PJ5161 .F62 1973)
5. Abdullah, Mustaffa Siti Rohaya Sarnap Siti Sujinah Sarnap. 2006. *Cara mudah belajar Bahasa Arab*. Singapore: Jahabersa. (PJ6106 .A22 2006)
6. Abu 'Amiir 'Izzat. 2008. *Kamus adik: bahasa Melayu-bahasa Inggeris-bahasa Arab.* Kuala Terengganu: Pustaka Darul Iman. (PJ6640 ABU 2008)
7. Mohd Azani Ghazali, Abdul Aziz Hassan @ Yahya. 2000. *Kamus ringkas Bahasa Melayu-Bahasa Arab.* Johor Bahru: Jahabersa. (PL5091.8 .A7 .M393 2000 rd)

UWB11302 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. Majendra, Maheswara (2010). *Kamus lengkap Indonesia-Jawa, Jawa-Indonesia/ Majendra Maheswara*. Pustaka Mahardika. XX(131732.1)
2. Yrama, Widya (2008). *Cara belajar membaca dan menulis huruf jawa, jilid 1* . Yrama Widya. Publication info:, 2008 XX(131738.1)
3. Yrama, Widya (2008). *Cara belajar membaca dan menulis huruf jawa, jilid 2*. Yrama Widya .Publication info:, 2008 XX(131739.1)
4. Budhi Santosa, Iman. (2010). *Nguri-uri paribasan Jawi = Melestarikan peribahasa Jawa*. Intan Pariwara. XX(131751.1)
5. Purwanto, Eko (2011). Pepah Bahasa Jawi. Cara mudah belajar cepat dan tuntas bahasa Jawa. Diva press. XX(131748.1)

UQ*1xxx1 Co-Curriculum I

Synopsis

This course is offered in the form of multiple choice of activities for Diploma students and undergraduates. Eight categories of activities are offered which are Public Speaking, Entrepreneurship, Sports, Community Service, Volunteering, Leadership, Cultural, Effort and Innovation.

BIC10103 Discrete Structure

Synopsis

The course discusses on the concept of discrete mathematics and how it is utilized in ICT practically. The course covers topics on fundamental principles of logic and proofs, sets, mathematical induction, relations and functions, recurrence relation, algorithm, and graph theory.

References

1. Rosen K., 2007. *Discrete mathematics and its applications*. 6th ed., New York: McGraw Hill Inc. Call no.: QA 39.2 .R65 2007
2. Kolman, B., Busby, R., Ross, S. 2004. *Discrete mathematical structures.* New Jersey: Prentice Hall, Inc. Call no.: QA76.9.M35 .K64 2004
3. Johnsonbaugh R., 2009. *Discrete mathematics*. 7th ed., Singapore: Prentice Hall, Inc. Call no.: QA39.2 .J63 2009
4. Simpson, A., 2002. *Discrete mathematics by example*. United Kingdom: McGraw-Hill. Call no.: QA39.2 .S55 2002
5. Stanoyevitch, Alexander., 2011. *Discrete structures with contemporary applications*. Chapman & Hall/CRC Press. Call no.: QA76.9.M35 .S73 2011
6. Krantz, S. G. 2009. *Discrete mathematics demystified*. New York: McGraw-Hill. Call no.: QA76.9.M35 .K72 2009

BIC10204 Algorithms and Programming

Synopsis

This course introduces students to the algorithm principles in solving problems and computer programming. Topics discussed include introduction to computer programming, problem

solving and algorithm, fundamental structure of programming, input and output data, control statement, functions, sequence, 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 no.: QA76.73.C153 .D44 2009
2. Levitin, A. V., 2007. *Introduction to the design and analysis of algorithms.* 2nd ed. Harlow: Addision Wesley. Call no.: 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 no.: 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 no.: XX(129998.1)

BIC10303 Algebra

Synopsis

Real Nombor: System of real number, notation and inequality, exponent, surd and logarithm. Equation and Inequality: Linear equation, formulae and application, quadratic equation and application, other equations, inequality, absolute inequality. Polynomial: Basic concept, algebra operasion for polynomial, remainder theorem and factor theorem, synthetic divider, quadratik equation, inequality and partial fraction. Function and Graph: Relationship and function, domain and range, special graph function: onstant 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. System of Linear Equations: Introduction, system of linear equations of two variables, system of linear equations of multiple variables. Matrices method: Inverse of matrices, Gauss-Jordan elimination, Cramer's rule.

References

1. Bittinger, Marvin L. (2011) *Intermediate Algebra*. Pearson Education. Call no.: QA154.3 .B57 2011
2. Woodbury, George (2009) *Elementary and Intermediate Algebra*. Pearson. Call no.: QA152.3 .W66 2009
3. Lial, Margaret L. (2012) *Beginning and intermediate algebra Intermediate Algebra*. Pearson Addison-Wesley. Call no.: 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: McGraw Hill International Ed. Call no.: QA188 .L56 2009

Year 1 Semester II

Classification	Code	Course	Credit
University Compulsory Courses	UWA10302 UWB10202 UQ*1xxx1	Islamic and Asian Civilisations Effective Communication Co-Curriculum II	2 2 1
Programme Core Courses	BIC10404 BIC10503 BIC10603	Data Structures Computer Architecture Statistics	4 3 3
Specialisation Course	BIE10103	Principles of Software Engineering	3
		Total Credit	18

UWA10302 Islamic and Asian Civilisations

Synopsis

This course discusses on the introductory to civilization, its development, interaction between civilizations, the Islamic civilization, Islam in Malay civilization; contemporary civilization issues and the principles of Islam Hadhari.

References

1. Saifullah Mohd Sawi (2009), *Sejarah dan tamadun Islam di Asia Tenggara*, Shah Alam Karisma Publications, [BP63.A785 .S24 2009]
2. Sazelin Arif, (2007), *Tamadun Islam dan tamadun Asia*, Shah Alam, Selangor: McGraw Hill. [BP190.5 .T35 2007]
3. Abu al-Fida al Hafiz Ismail ibn Kathir; penterjemah Zaidah Mohd Nor et al. (2005), *Sejarah tamadun Islam Ibn Kathir*, Kuala Lumpur: Dewan Bahasa dan Pustaka. [DS36.85.I32 2005 v.1]
4. Mohd Liki Hamid, (2003), *Pengajian tamadun Islam*, Bentong: PTS Publications and Distributors. [DS36.85 .P46 2003]
5. Lok, Chong Hoe, (1998), *Tamadun Cina: Falsafah, pandangan hidup dan aspek-aspek kesenian*, Kuala Lumpur: Pusat pembangunan dan Pendidikan Komuniti (CEDC) dan Sekretariat Falsafah dan Sains Islam. Universiti Sains Malaysia. [DS721 .L64 1998]
6. Rajakrishnan Ramasamy, M Rajantheran, (1994), *Pengantar tamadun India*, Kuala Lumpur: Penerbit Fajar Bakti. [DS425 .R34 1994]
7. Arkoun, Mohammed Ruslani, (2001), *Kontemporer: Menuju dialog antara agama*, Yogyakarta: Pustaka Pelajar. [BP163 .A74 2001 N]

UWB10202 Effective Communication

Synopsis

This course emphasizes on task-based approach and focuses on developing students' delivery of speech in oral interactions and presentations. Importance is given on mastery of self-directed learning, teamwork, research, oral presentations, reasoning and creativity. This course also enables students to acquire knowledge and skills necessary for conducting and participating in meetings, including writing of meeting documents. Students will also be exposed to the techniques of conducting interviews.

References

1. Cheesebro,T, O'Connor, L. & Rios, F. (2007). *Communication skills: preparing for career success* (3rd ed.) Upper Saddle River, NJ: Pearson. Call no.: HF5718 .C53 2007
2. Davies, W.J. (2001) *Communication skills: a guide for engineering and applied science student* (2nd ed.) London: Prentice Hall. Call no.: T10.5 .D38 2001
3. Joan van Emden, L. (2004). *Presentation skills for students*. New York: Palgrave Macmillan. Call no.: PN4129 .V36 2004
4. Richard Johnson-Sheehan (2005). *Technical Communication Today*. New York: Pearson. Call no.: TK5101 .S26 1997
5. Salbiah Seliman et al. (2004). *English Communication for learners in engineering*. Malaysia: Prentice Hall. Call no.: P95 .S24 2002

UQ*1xxx1 Co-Curriculum II

Synopsis

This course is offered in the form of multiple choice of activities for Diploma students and undergraduates. Eight categories of activities are offered which are Public Speaking, Entrepreneurship, Sports, Community Service, Volunteering, Leadership, Cultural, Effort and Innovation.

BIC10404 Data Structures

Synopsis

The course introduces students to the concept of data structures in computer programming. Topics discussed include introduction to data structures, types of data and abstract data, linked lists, stack frames, queues, search and sort, trees and graphs.

References

1. Weiss, M.A., 2006. *Data structures and algorithm analysis in C++*. 3rd ed. Harlow: Addision Wesley. Call no.: 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 no.: 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 no.: 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 no.: QA76.73.C153 .M38 2011.

BIC10503 Computer Architecture

Synopsis

This course introduces students to the knowledge and skills in computer architecture. Topics discussed include introduction, bus system, memory organisations, input/output, computer arithmetic, instruction set, centre 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 no.: 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 no.: 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 no.: TK7885 .D85 2006
5. Tanenbaum, A. S., 2005. *Structured computer organization.* 5th ed. Upper Saddle River, NJ: Prentice Hall. Call no.: QA76.6 .T38 2006

BIC10603 Statistics

Synopsis

Descriptive Statistics: statistics definition, sampling technique, frequency distribution, graph, measure of Central Tendency 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 no.: QA276.12 .B58 2007

2. Mario F. Triola. (2005) *Essential of Statistics*. 2nd Ed. Pearson Adison Wesley. Call no.: 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 no.: HF1017 .B47 2007
4. Douglas C. Montgomery, George C. Runger & Norma Faris Hubele. *Engineering Statistics*. John Wiley. 1998. Call no.: QA2776.12 .M66 1998
5. Larsen, Richard J.(2012), *An Introduction to mathematical statistics and its applications*. 5th Ed. Pearson Adison Wesley. Call no.: QA276 .L37 2012
6. Bowerman, Bruce L,(2012). *Essentials of business statistics.* 4th Ed. McGraw Hill International Edition. Call no.: HF1017 .E87 2012

BIE10103 Principles of Software Engineering

Synopsis

The course exposes students to the concepts of engineering software in software development. Topics of discussion include introduction to software engineering, software process, project management, system engineering, needs analysis, software design and testing.

References

1. Sommerville, I. 2011. *Software engineering*, 9th Ed. Harlow; Pearson Education Limited. Call no.: QA76.758 .S65 2007
2. Schach, S. R. 2011. *Object-oriented and classical software engineering*, 8th Ed. New York; McGraw-Hill. Call no.: QA76.758 .S32 2011
3. Pressman, R. S. 2010. *Software engineering: a practitioner's approach*, 7th Ed. New York; McGraw-Hill. Call no.: QA76.6 .P73 2005
4. Mall, R. 2009. *Fundamentals of software engineering*, 3rd Ed. New Delhi; PHI Learning P. Ltd. Call no.: QA76.758 .G43 2003
5. Pfleeger, S. L. & Joanne, M. A. 2006. *Software engineering theory and practice*, 3rd Ed. New Jersey; Prentice Hall. Call no.: QA76.758 .P44 2006

Year 1 Semester III

Classification	Code	Course	Credit
Programme Core Courses	BIC10703	Computing Skills	3
Specialisation Course	BIE10203	Software Process	3
		Total Credit	6

BIC10703 Computing Skills

Synopsis

The course introduces student to three fields of fundamental skills in computing and information technology. Students will work on hands-on assignments of computer system maintenance, multimedia product, and web development. Students will be exposed to business concept and internet marketing 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 no.: QA76.3 .M494 2004.
2. Schmidt, C.A., 2008. The complete a+ guide to PC repairs. Boston: Addison-Wesley. Call no.: TK7887 .S35 2008.
3. Vaughn, T., 2011. Multimedia: making it work. 8th ed. New York: McGraw Hill. Call no.: QA76.575 .V38 2011.
4. Felke-Morris, T., 2011. Web development and design foundations with xhtml. 5th ed. Boston, MA: Addison-Wesley. Call no.: QA76.76.H94 .F44 2011.
5. Kling, A.A., 2011. Web 2.0. Farmington Hill, MI: Lucent Books. Call no.: 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.

BIE10203 Software Process

Synopsis

The course introduces students to the theories and practicals of software process. Topics of discussion include introduction to software process, process models, Agile process, and software process analysis approaches.

References

1. Schach, S. R. 2011. *Object-oriented and classical software engineering*, 8th Ed. New York; McGraw-Hill. Call no.: QA76.758 .S32 2011
2. Pressman, R.S., 2011. *Software engineering, a practitioner's approach*. 9th Ed. New York; McGraw-Hill. Call no.: QA76.758 .S65 2007
3. Bernd Bruegge, & Allen H. Dutoit., 2009. *Object-oriented software engineering: using UML, patterns, and Java*, 3rd Ed. New Jersey; Prentice Hall. Call no.: QA76.64 .L47 2005
4. Jain, Mukesh. 2009. *Delivering successful projects with TSP and Six Sigma : a practical guide to implementing team software process*, Boca Raton, FL: CRC Press, Call no.: QA76.76.D47 .J36 2009
5. Oktaba, Hanna & Piattini, Mario, 2008. *Software process improvement for small and medium enterprises: techniques and case studies*, Hershey: Information Science Reference. Call no.: QA76.76.D47 .S634 2008

Year 2 Semester I

Classification	Code	Course	Credit
University Compulsory Course	UWB20302 UWS10103	Technical Writing Nationhood and Current Development of Malaysia*	2 3
Programme Core Courses	BIC20803 BIC20904 BIC21003	Operating Systems Object Oriented Programming Systems Analysis and Design	3 4 3
Specialisation Course	BIE20303	Algorithms and Complexity	3
		Total Credit	18

UWB20302 Technical Writing

Synopsis

This course introduces students to report writing skills needed at tertiary level. Students will learn basic report writing skills such as proposals, progress report, informational and analytical report. In order do this, they will learn how to collect data using questionnaires. The data collected will be analyzed, transferred into graphic forms and presented orally and in writing. Based on the analysis of data, students will be able to draw conclusions and make recommendations.

References

1. Dorothy Cheung et. al. (1999). Report writing for engineering students. 2nd edition, Singapore: Prentice Hall. PE1475 .R46 1999 N3
2. Finkelstein, J. (2008). Pocket Book of technical writing. 3rd ed. Singapore: McGraw Hill. T11 .F56 2008
3. Gerson, S. J. & Gerson, S. M. (2003). Technical writing: Process and product. 3rd ed. New Jersey: Prentice Hall. PE1475 .G47 2000
4. Kolin, P. C. (2006). Successful writing at work. Concise ed. USA: Houghton Mufflin Company. PE1408 .K64 2009
5. Lakshmy Anantha Krishnan et. al. (2003). Engineering your report: From start to finish. Singapore: Prentice Hall. T11 .E64 2006

UWS10103 Nationhood and Current Development of Malaysia*

Synopsis

This course discusses on the fundamental concept, process of formation, and development of Malaysia. It includes Malay Sultanate of Malacca Empire, imperialism and colonialism, patriotisme and nationalism, the independence and formation of Malaysia, Constitution of Malaysia, government system of Malaysia, main policies in national development, roles and responsibilities of a citizen, and the success and challenges of Malaysia.

References

1. Mohd. Ashraf Ibrahim (2004).*Gagasan Bangsa Malayan yang Bersatu 1945-57*. Bangi: Penerbit UKM. Call no.: DS597 .M37 2004
2. Nazaruddin Mohd Jali, Ma'rof Redzuan, Asnarulkhadi Abu Samah dan Ismail Mohd Rashid (2005). *Pengajian Malaysia*. Petaling Jaya: Prentice Hall. Call no.: DS596.6 .P46 2001 N2
3. Noor Aziah Mohd. Awal (2003). *Pengenalan kepada Sistem Perundangan di Malaysia*. Petaling Jaya: International Law Book Services. Call no.: KPG68 .N66 2003
4. Ruslan Zainudin, Mohd Mahadee Ismail dan Zaini Othman (2005). *Kenegaraan Malaysia*. Shah Alam: Fajar Bakti. Call no.: JQ715 .R87 2005
5. 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. (Modul Kenegaraan dan Pembangunan Mutakhir Malaysia)
6. Andaya, B.W. and Andaya, L.Y. (1982). *A History of Malaysia*. London: Macmillan. [DS596.A52 2001]
7. Abdul Aziz Bari (2002). *Majlis Raja-Raja : Kedudukan dan Peranan dalam Perlembagaan Malaysia*. Kuala Lumpur : Dewan Bahasa dan Pustaka. [JQ1062.A58 .A39 2002]
8. Aziz Deraman (1992). *Tamadun Melayu dan Pembinaan Bangsa Malaysia*. Kuala Lumpur: Arena Ilmu Sdn. Bhd. [HN700.6 .A952 2000]
9. Francis Loh Kok Wah dan Khoo Boo Teik (2002). *Democracy in Malaysia*. Cornwall: Curzon Press.
10. Jurij Jalaludin (1991). *Wawasan 2020: Aspek Politik dan Sosial.* Kuala Lumpur: Arena Ilmu Sdn. Bhd.

11. Lembaga Penyelidikan Undang-undang (2010). *Perlembagaan Persekutuan*. Petaling Jaya: International Law Book Services.

BIC20803 Operating Systems

Synopsis

This course introduces students to the knowledge and skills of operating systems management. Topics that will be discussed include introduction to operating systems, computer system structure, processes, CPU scheduling, deadlock, memory management, virtual memory and file systems.

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 no.: 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 no.: 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 no.: QA76.76.O63 .B42 2007.

BIC20904 Object Oriented Programming

Synopsis

The course introduces students to the concepts of object and object oriented programming. Topics which will be discussed include introduction to OOP, types of primitive data and operator, basic of OOP language, class and objects, and inheritance 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 no.: 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 no.: 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 no.: TK7867 .H67 2006.
4. Deitel, I. & Deitel, J., 2007. *Java how to program.* 7th ed. Upper Saddle River, NJ: Prentice Hall. Call no.: 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 no.: 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 no.: QA76.64 .S26 2006.

BIC21003 Systems Analysis and Design

Synopsis

The course introduces students to Software Life Cycle Model such as analysis, logical design, physical design, implementation and maintenance, as well as techniques and methods of system development such as the decomposition diagrams, entity-relationship diagrams (ERD), data flow diagrams (DFD) and modelling procedures. Students will also be taught on how to identify system analyses through literature, economy, technical, skills, group work, and automation role in system analysing and design.

References

1. Kendall, K. E. & Kendall, J. E. 2008. *Systems analysis and design*. 7th ed. New Jersey: Pearson Education. Call no.: QA76.9.S88 .K46 2008.
2. Satzinger, J. W., Jackson, R.B. & Burd, S.D., 2009. *Systems analysis and design in changing world.* 5th ed. Boston, MA: Course Technology. Call no.: QA402 .S37 2009.
3. Dennis, A., Wixom, B. H., & Roth, R. M., 2009. *Systems analysis and design.* 4th ed. New Jersey: John Wiley and Sons. Call no.: QA76.9.S88 .D46 2009.
4. Hoffer, J. A., George, J. F., & Valacich, J.S., 2008. *Modern systems analysis and design.* 5th ed. New Jersey: Pearson Education. Call no.: QA76.9.S88 .H63 2008.
5. Marakas. G. M., 2006. *Systems analysis and design: an active approach.* 2nd ed. Boston: McGraw Hill. Call no.: QA76.9.S88 .M37 2006.

BIE20303 Algorithms and Complexity

Synopsis

The course introduces students to the concepts of algorithms and complextity. Topics of discussion include introduction to algorithms, algorithms efficiency analysis, recursive approach, divide and conquer algorithms, greedy algorithms, and polynomial (P) and nondeterministic polynomial (NP).

References

1. Strichman, O., 2010. *Theory and applications of satisfiability testing*. Berlin; Springer-Verlag.
2. McConnell, J. J., 2008. *Analysis of algorithms: an active learning approach*. 2nd Ed. London; Jones and Bartlett Publisher. (QA76.9.A43 .M36 2008)
3. Levitin, A., 2007. *Introduction to the design and analysis of algorithms.* 2nd Ed. Boston;Pearson Education. (QA76.9.A43 .L48 2007)
4. Weiss, M.A., 2006. *Data structures and algorithm analysis in C++*. Harlow; Addison Wesley. (QA76.73.C153 .W44 2006)
5. Witt, C., 2005. *Worst-case and average-case approximations by simple randomized search heuristics*. STACS 2005, Lecture Notes in Computer Science, 2005, Vol. 3404, pp. 44-56, Berlin; Springer-Verlag.

Year 2 Semester II

Classification	Code	Course	Credit
University Compulsory Course	UWS10202	Ethnic Relations**	2
Programme Core Courses	BIC21102 BIC21203 BIC21303 BIC21404	Professional Ethics and Occupational Safety Web Development Computer Networks Database	2 3 3 4
Specialisation Course	BIE20404	Visual Programming	4
		Total Credit	18

UWS10202 Ethnic Relations**

Synopsis

This course focuses on the conceptual and practicality of the ethnic relation in Malaysia community. The discussions comprise of fundamental concepts of ethnic relation and the history of the construction of a plural society, constitution as the core of the societal life, relationship between development and the ethnicity in the aspects of economy, politics and social based on the government and society top-down and bottom-up approaches.

References

1. Lembaga Penyelidikan Undang-undang (2003).*Perlembagaan Persekutuan*. Petaling Jaya: International Law Book Services. Call no.: KPG 1744.51963.A3.A4 2003 rw
2. Mansor Mohd. Noor, Abdul Rahman Abdul Aziz dan Mohamad Ainuddin Iskandar Lee (2006). *Hubungan Etnik di Malaysia*. Petaling Jaya: Prentice Hall. Call no.: DS595.m37 2006
3. Nazri Muslim& Nasruddin Yunus. (2006). *Hubungan Etnik.* Selangor: Fulson Trading Co. [UTHM Library request]
4. Shamsul Amri Baharuddin (2007). *Modul Hubungan Etnik.* Shah Alam: Universiti Teknologi MARA. [Modul Hubungan Etnik]
5. Zaid Ahmad, Ho Hui Ling, Sarjit Sing Gill, Ahmad Tarmizi Talib, Ku Halim Ku Arifin, Lee Yok Fee, Nazri Muslim dan Ruslan Zainuddin (2006). *Hubungan Etnik di Malaysia*. Shah Alam: Oxford Fajar Sdn. Bhd. [UTHM Library request]
6. Wan Hashim. (2011). *Hubungan Etnik di Malaysia.* Kuala Lumpur: Institut Terjemahan Negara Malaysia. [XX (1302391]

BIC21102 Professional Ethics and Occupational Safety

Synopsis

The course includes discussions on professional ethics in computing. Topics of discussion include introduction to computing professional ethics, professional ethics and responsibilities, personalities in computing ethics, security and control, copyright and intellectual property, freedom in speech, courtesy, pornography and filtering, and cyber laws in Malaysia.

References

1. Quinn, M. J., 2010. *Ethics for the information age.* 4th ed. Boston: Addison Wesley. Call no.: 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 no.: KPG1390.M34 2001 rw N2.
7. Factories and Machinery Act & Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call no.: KPG1390.A31967 .A4 2001 rw N1.

BIC21203 Web Development

Synopsis

The course focuses on knowledge and skills in web application development. The course will discuss on introduction to WWW and Internet, markup language, style sheet, client server scripts, database link through web and web technology development.

References

1. Sebesta, R. W., 2011. *Programming the world wide web.* 6th ed. Colorado: Addison-Wesley. Call no.: 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 no.: 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 no.: QA76.625 .W42 2003
5. Greenlaw, R. dan Hepp, E. (2002). *Fundamentals of the Internet and the world wide web*, Toronto: McGraw Hill. Call no.: TK5105.875 .I57 .G73 2002 n.1

BIC21303 Computer Networks

Synopsis

The course introduces students to knowledge and skills related to computer networks. Discussion topics include network and data communication, data communication, network: OSI model, network: TCP/IP model, wide area network (WAN), and Internet and current technology.

References

1. Forouzan, B. A., 2007. *Data communications and networking.* 4th ed. New York: McGraw-Hill. Call no.: 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 no.: XX(123371.1)
5. Stallings, W., 2011. *Data and computer communications.* 9th ed. New Jersey: Prentice Hall. Call no.: XX(132126.1)

BIC21404 Database

Synopsis

The course introduces students to knowledge and skills in database. Topics of discussions include introduction to database, concept of database, entity relationship modelling, database normalisation, database design, structured query language (SQL) and online database technologies.

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 no.: 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.

BIE20404 Visual Programming

Synopsis

The course introduces students to the theory and practicals of visual programming. Topics of discussions include abstract classes and interfaces, event-driven programming, user interface development, applet, images and video, exceptions and assertions, and input and output.

References

1. Farrel, J. 2012. *Java programming*. 6th Ed. Boston; Course Technology, Cengage Learning. Call no.: QA76.73.J38 .F38 2012
2. Morelli R. & Walde R., 2006. *Java, Java, Java: Object-oriented problem solving*. New York; Prentice Hall. Call no.: TK7867 .H67 2006
3. Deitel, I. & Deitel, J., 2007. *Java how to program*, 7th Ed. New York; Prentice Hall. Call no.: QA76.73.J38 .D44 2007
4. Lewis J. & Loftus W., 2007. *Java software solutions: foundations of program design*. 5th Ed. New York; Prentice Hall. Call no.: QA76.73 J38 .L48 2007
5. Sanders K. E. & Dam A. V., 2006. *Object-oriented programming in Java: a graphical approach*, Preliminary Ed. Harlow; Addison-Wesley. Call no.: QA76.64 .S26 2006

Year 3 Semester I

Classification	Code	Course	Credit
University Compulsory Course	BIC31502	Creativity and Innovation	2
Programme Core Courses	BPK20802	Entrepreneurship	2
Specialisation Course	BIM30503 BIE30603 BIE30503 BIC31602	Human-Computer Interaction Modelling and Needs Analysis Software Project Management Bachelor Degree Project I	3 3 3 2
Elective Courses	BIE33x03	Elective I	3
		Total Credit	18

BIC31502 Creativity and Innovation

Synopsis

This course focuses on developing a creative person who will eventually think strategically, creatively and critically. The knowledge and skills acquired throughout the course will later be applied by the students in solving problems and making decisions in the future. In this course, students will be exposed to various creativity and problem solving techniques. Some of the skills to be covered throughout the course are problem solving, techniques in creativity and techniques in innovation.

References

1. Bernacki, Ed. (2002). Wow! That's a great idea! Insight, idea, opportunity, action. Prentice Hall, Singapore. Call no.: HD53 .B47 2002
2. De Bono, E. (2003). Serious Creativity 1: Lateral Thinking Tools, Techniques and Application. Allscript Books, Singapore. Call no.: BF408 .D365 2003
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.

BPK20802 Entrepreneurship

Synopsis

This course cover various topics related to basic entrepreneurship including introduction to entrepreneurship, entrepreneurs characteristics and motivation, screening business environment and opportunity, formation of business and managing business. Students will also be exposed to real business.

References

1. Charles E. Bamford, Garry D. Bruton (2011). Entrepreneurship: a small business approach. New York : McGraw-Hill. Call no.: 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 no.: HD2341 .E57 2011
3. Hisrich, R.D., Peter, M.P., Shepherd, D.A., (2010). Entrepreneurship, 8th Edition. McGraw Hill. Call no.: HD62.5 .H57 2010
4. Donald F. Kuratko, Richard M. Hodgetts. (2007). Entrepreneurship: theory, process, practice, 7th Edition. Mason: Thomson South-Western. Call no.: HB615 .K87 2007
5. John. B., Tidd. J. (2011). Innovation and entrepreneurship. 2nd Edition. Chichester, West Sussex, UK. Call no.: HD53 .B48 2011

BIM30503 Human-Computer Interaction

Synopsis

The course include discussions on human and computer interactions through user interface design. In the course, students will learn about topics on introduction to human-computer interactions, users factors, computer and interactions between human and computer, design process and prototype, interaction design, evaluation techniques and human assistance. Students will also improve their skills in designing effective user interface using suitable software based on case study.

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

BIE30603 Pemodelan dan Analisa Keperluan

Synopsis

Kursus ini akan mendedahkan pelajar kepada teori dan pratikal berkaitan pemodelan dan analisis keperluan. Topik-topik perbincangan merangkumi proses perisian, analisis keperluan, pemodelan keperluan**,** penentuan keperluan, spesifikasi keperluan dan analisis lanjutan.

References

1. L. Chung & Julio Cesar Sampaio do Prado Leite, 2009. *On non-functional requirement in software engineering*. Berlin;Springer-Verlag
2. Berenbach, B. & Wolf, T., 2007. *A unified requirements model; integrating features, use cases, requirements, requirements analysis and hazard analysis*. Munich: IEEE Computer Society.
3. Maciaszek, L. A., 2007. *Requirements analysis and system design*. 3rd Ed. Harlow; Addison-Wesley. Call no.: QA76.9.S88 .M32 2007
4. Lieberman. A. B., 2006. *The art of software modelling*. Boston; Auerbach Publication.
5. Dennis, A., Wixom, B.H. & Tegarden, D. P., 2005. *System analysis and design with UML version 2.0: an object-oriented approach*. New Jersey; Wiley. Call no.: QA402 .D464 2005

BIE30503 Software Project Management

Synopsis

The course introduces students to the concepts of software project management. Topics of discussion include introduction to project management, project planning, project time and cost management, project human resource and communications management, and risks and procurement management.

References

1. Soriano, J. L. 2012. *Maximizing benefits from IT project management: from requirements to value delivery*. Boca Raton, FL; CRC Press. Call no.: HD30.2 .S67 2012
2. Kerzner, H. 2009. *Project management: a system approach to planning, scheduling and controlling*. 10th Ed. New Jersey: John Wiley & Sons, Inc. Call no.: HD69.P75 .K47 2009
3. Schwalbe, K., 2007. *Information technology project management*. 5th Ed. Boston; Thomson. Call no.: HD69.P75 .S23 2007
4. Hughes, B. & Cotterell, M., 2002. *Software project management*. 4th Ed. London; McGraw-Hill. Call no.: QA76.76 .C67 2002 N1
5. Marchewka, J. T., 2006. *Information technology project management: providing measurable organizational value*. New Jersey; Wiley. Call no.: HD69.P75 .M375 2006

BIC31402 Bachelor Degree Project I

Synopsis

The course focuses on the concept and research methodology of bachelor degree project. Topics discussed are introduction to computing projects, research, project formulation/ selection, paper critics, project planning and risks management, project implementation – software development, and writing and presentation.

References

1. Pusat Pengajian Siswazah UTHM, 2009. *Panduan menulis tesis*. 3rd ed. Parit Raja: Penerbit UTHM.
2. Felix B. Tan, 2008. Global information technologies: concepts, methodologies, tools and applications. Hershey, PA: Information Science Reference (T58.5 .T36 2008 v.1).
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.

Year 3 Semester II

Classification	Code	Course	Credit
Specialisation Course	BIE30703 BIC31704	Software Quality Assurance Bachelor Degree Project II	3 4
Elective Course	BIE33x03 BIE33x03 BIE33x03	Elective II Elective III Elective IV	3 3 3
		Total Credit	16

BIE30703 Software Quality Assurance

Synopsis

The course introduces students to the theories and practicals of software quality assurance. Topics of discussion include introduction to software quality, components of software quality assurance in software development, software quality management and quality standards.

References

1. Puntambekar, A. A. 2010. *Software engineering & software quality assurance*. 1st Ed. Pune: Technical Publication.
2. Lee, R. Y. & Ishii, N. Eds. 2009. *Software engineering research, management & application*. Berlin;Springer-Verlag
3. Naik, K. & Tripathy, P. 2008. *Software testing and quality assurance: theory and practice*. New Jersey: John Wiley & Sons.
4. Stamelos, G. I. & Sfetsos, P., 2007. *Agile software development quality assurance*. London; Idea Group Inc.
5. Galin, D., 2004. *Software quality assurance: from theory to implementation.* Harlow; Addison Wesley. Call no.: QA76.76 .Q35 .G34 2004
6. Tian, J., 2005. *Software Quality Engineering: Testing. Quality Assurance and Quantifiable improvement.* New Jersey: John Wiley & Sons, Call no.: QA76.76.Q35 .T52 2005
7. Murali, C., 2011. *Mastering software Quality Assurance: Best practices, tools and techniques for software developers*. Fort Lauderdale, Fla.: J. Ross Pub, Call no.: QA76.76.Q35 .C43 2011

BIC31704 Bachelor Degree Project II

Synopsis

In the course, students will implement methodology and will be able to implement project successfully. Students will have to develop and present final product with complete documentation for each phase of the project development.

References

1. Pusat Pengajian Siswazah UTHM, 2009. *Panduan menulis tesis*. 3rd ed. Parit Raja: Penerbit UTHM.
2. Felix B. Tan, 2008. Global information technologies: concepts, methodologies, tools and applications. Hershey, PA: Information Science Reference (T58.5 .T36 2008 v.1).
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.

Year 4 Semester I

Classification	Code	Course	Credit
Programme Core Courses	BIC41812	Industrial Training	12
		Total Credit	12

BIC41812 Industrial Training

Synopsis

The course requires students to attend industrial training for a period of 24 weeks at any government or private agency. Students will be tasked on assignments or projects, which have been discussed and approved by both faculty and the agency, and the results of the assignments or projects will have to be presented at the end of the course.

References

1. UTHM Practical Training Log Book

Elective Courses

Code	Course	Credit
BIE33003	Software Engineering Security	3
BIE33103	DotNet Programming	3
BIE33203	Distributed Systems	3
BIE33303	Real-Time Systems Application	3
BIE33403	Formal Methods	3
BIE33503	Special Topics in Software Engineering	3

BIE33003 Software Engineering Security

Synopsis

The course introduces students to the concepts of software engineering security. Topics of discussion include security concepts, goals of security in software, software weaknesses, software development control, techniques in software development, database in software security, backup and recovery, and procedures to guard against invasions.

References

1. Vacca R. J., 2009. *Computer and information security handbook*. USA: Morgan Kaufmann. Call no.: QA76.9.A25 .C68 2009
2. Belapurkar, A. et al, 2009. *Distributed systems security: issues, processes, and solutions*. New Jersey; John Wiley.
3. Dhillon, G., 2007. *Principles of information systems security*. New Jersey; John Wiley.
4. Stamp, M., 2006. *Information security*. New Jersey; John Wiley.
5. Layton, P. T, 2006. *Information security: design, implementation, measurement, and compliance*. Munich:Auerbach Publications
6. Tipton, H.F., Krause, M., 2009. *Information security management handbook,* Boca Raton, FL : CRC Press, Call no.: QA76.9.A25 .I5344 2009 v.3
7. Stamp, M. 2011. Information security: Principle and Practices. Indianapolis, IN: John Wiley. Call no.: QA76.9.A25 .S72 2011

BIE33103 DotNET Programming

Synopsis

The course introduces students to the theories and practicals of .NET programming. Topics of discussion include introduction to .NET framework, Visual Studio .NET, .NET programming, GUI programming, multithreading**,** files, Framework Class Library (FCL) and graphics.

References

1. McKeown, J. S. & McKeown, J. 2010. *Programming in visual basic 2010: The very beginner's guide*. New York;Cambridge University Press
2. Deitel, H. M., Deitel, P. J. & Nieto, T. R., 2008. *Visual basic .2008: how to program*. New Jersey; Prentice-Hall. (QA76.73.B3.D444 2009)
3. Deitel, H. M. & Deitel, P. J., 2006. *Visual C# 2005: how to program*. New Jersey; Prentice-Hall.
4. Schlesinger, R., 2008. *Visual basic .net: the programming language*. New York; Jones & Bartlett. (QA76.73.B3.S34 2008)
5. Ekedahl, M. V., 2008. *Programming with Microsoft visual basic 2008: an object-oriented approach*. 3rd Ed. Boston; Course Technology.
6. Hogenson, G., 2008. *Foundations of C++/CLI: the visual C++ language for .net 3*.5. New York; Apress.

BIE33203 Distributed Systems

Synopsis

The course introduces students to the theories and practicals in distributed systems. Topics of discussion include characteristics of distributed systems, system models, communications between processes, distributed objects and remote invocation, and operational system supports.

References

1. Tanenbaum, A.S. & Steen, M. V., 2007. *Distributed systems: principles and paradigms*. 2nd Ed. New Jersey; Prentice Hall. (QA76.9.D5 .T36 2007)
2. Kshemkalyani, A. D. & Singhal, M., 2008. *Distributed computing: principles, algorithm and systems*. New York; Cambridge University Press. (QA76.9.D5.K73 2008)

3. Ghosh, S., 2008. *Distributed system: An algorithmic approach*. New York; Chapman & Hall/CRC. (QA76.9.D5.G56 2007)
4. Tanenbaum, A. S. & Steen, M. V, 2007. *Distributed computing: principles and paradigm*. New Jersey; Pearson Prentice Hall.
5. Birman, K. P., 2005. *Reliable distributed systems: Technologies, web services, and applications*. Greenwich; Springer.

BIE33303 Real-Time Systems Application

Synopsis

The course introduces students to the theories and practicals in real-time systems application. Topics of discussion include introduction, system design, petri nets analysis, time, reliability and fault tolerance, scheduling and tasks distribution, and shared variable-based synchronization and communications.

References

1. Burns, A. & Wellings, A., 2009. *Real time system and programming languages: Ada 95, real time java and real time POSIX*. 4th Ed. Canada;Pearson Education (QA76.54.B87 2009)
2. Leedham, C. G. & Seow, K. T., 2007. *Embedded real time systems: introductory concepts and tools*. Singapore; Pearson-Prentice Hall. (TK7895.E42.L44 2005)
3. Oshana, R., 2006. *DSP software development techniques for embedded and real-time systems*. Oxford;Elsevier Inc. (TK5102.9.O83 2005)
4. Noergaard, T., 2005. *Embedded systems architecture: a comprehensive guide for engineers and programmers*. Oxford;Elsevier Inc. (TK7895.E42.N63 2005)
5. Wolf, W., 2005. *Computers as components: principles of embedded computing system design*. San Francisco; Morgan Kaufmann. (QA76.9.S88.W634 2005)

BIE33403 Formal Methods

Synopsis

The course introduces students to the theories and practicals in formal methods. Topics of discussion include introduction to formal methods, set and predicate, schemes and relationships, transformational development, critical system specifications and verifications.

References

1. Dong J.S. & Zhu, H. Eds. 2010. 'Formal Methods and Software Engineering: 12th International Conference on Formal Engineering Methods', ICFEM 2010, Shanghai, China, November 17-19, 2010, Proceedings. Berlin; Springer-Verlag.
2. Boca, P. P., Bowen, P. J., & Siddiqi, I. J. Eds. 2010. *Formal methods: state of the art and new directions*. London; Springer-Verlag.
3. Meyer, B., 2009. *Touch of class: learning to program well with objects and contracts*. Berlin; Springer-Verlag.
4. Taibi, T., 2007. *Design patterns formalization techniques*. London; IGI Global. (QA76.76.P37 .D47 2007).
5. Frappier, M. & Habrias, H., 2006. *Software specification method*. London; ISTE Ltd. (QA76.9.F67 .S63 2006)

BIE33503 Special Topics in Software Engineering

Synopsis

The course is student research oriented within the field of software engineering especially in technology transfers and new findings. The course requires direct students involvement in discussions in class or online (newsgroup/online forum). Topics discussed will be on current issues and latest techniques in software engineering.

References

1. Ramsin, R & Paige, R, F, 'Iterative criteria-based approach to engineering the requirements of software development methodologies', IET Software, vol. 4, no. 2, pp. 91-104, 29 March 2010 http://dx.doi.org/10.1049/iet-sen.2009.0032
2. Lan Lin, Prowell, S, J & Poore, J, H 2009, 'An axiom system for sequence-based specification', Theoretical Computer Science, vol. 411, no. 2, pp. 360-376.
3. Rossi, G., Pastor, O., Schwabe, D., & Olsina, L., 2008. *Web engineering: modeling and implementing web applications*. London; Springer-Verlag. (TK5105.88813.W45 2008)
4. Dyba, T. & Dingsoyr, T., 2008. *Empirical study on agile software development: a systematic review*. Norway: Elsevier Inc.
5. Michael, L. & Padgham, L., Eds., 2007. *Agent-oriented software engineering.* New York; Springer-Verlag.

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