ACADEMIC PROFORMA

2021 2022

UTHM
Universiti Tun Hussein Onn Malaysia

BACHELOR OF
CIVIL ENGINEERING WITH HONOURS

QS STARS™ RATING SYSTEM

Universiti Tun Hussein Onn Malaysia
Is Rated as a Five-Star Institution

QS STARS™ RATING SYSTEM — Teaching
QS STARS™ RATING SYSTEM — Employability
QS STARS™ RATING SYSTEM — Innovation
QS STARS™ RATING SYSTEM — Online Learning
QS STARS™ RATING SYSTEM — Inclusiveness

UTHM Produces Professionals

FACULTY OF CIVIL ENGINEERING AND BUILT ENVIRONMENT
Universiti Tun Hussein Onn Malaysia
86400, Parit Raja, Batu Pahat, Johor

Information contained in this proforma is true at the time of printing and the University has the right to make any amendment according to needs.

Contents

Foreword from Vice Chancellor

Assalammualaikum Warahmatullahi Wabarakatuh and Greetings.

I would like to congratulate and welcome all students who will embark on the next important chapter of your life here at UTHM. We appreciate your trust for choosing to be with UTHM in continuing your endeavor for success in your life.

The Coronavirus Disease 2019 (Covid-19) has continue to deny new and current students the opportunity to experience higher education environment one would dream. The innovation of vaccines has given us the ray of hope that would eventually allow us to do what we do best, i.e. educating the young and bright Malaysians like you.

I would like to highlight that UTHM has set four main pillars in order become a global technoprenuer university. They are Edu-Train, Technopreneur, UTHM Prihatin and Governance. At the heart of these pillars are the students and staffs who will be the driving force for success. As a new student to this university, it is my hope that you will participate and contribute to the mission of the university.

Nevertheless, UTHM will continue to strive in providing the best learning experience available. Academic programmes are continuously reviewed to ensure that the most recent educational initiatives are implemented. This is in line with the aspirations of the Ministry of Higher Education Malaysia in transforming learning and teaching process to be more flexible, organic, dynamic and effective. Additionally, initiatives such as High Impact Educational Practices (HIEPs), Future Ready Curriculum (FRC), Entrepreneurship Integrated Education (EIE) will take centre stage and shape the academic curriculum, which will increase the Graduate Employability (GE). These initiatives, coupled with dedicated academics and world class facilities will produce holistic graduates and later professionals, as promised in our tagline, ‘UTHM Produces Professional”.

On a final note, I would like to again welcome all students to our big family. I believe that you will become successful university graduates and will continue the university tradition of academic excellence. I am also confident that you will be able to apply knowledge and skills gained for the benefit of the society.

Best wishes.

Y. BHG. PROFESSOR DATUK Ts. Dr. WAHID BIN RAZZALY
Vice Chancellor
Universiti Tun Hussein Onn Malaysia

Foreword from Deputy Vice Chancellor (Academic and International)

Assalammualaikum Warahmatullahi Wabarakatuh and Greetings.

I would like to take this opportunity to congratulate and welcome all new students of the academic session 2021/2022 to Universiti Tun Hussein Onn Malaysia (UTHM). Similarly, my congratulations to the Centre for Academic Development and Training for successfully publishing this proforma in which can become a guide for the students to plan their learning journey at the university.

As everyone is aware, the Covid-19 pandemic has continued to change Malaysia's higher education landscape. All universities must adjust to the new norm which affects the learning and teaching process. Students and lecturers are left with no other options than to continue with online classes. Thus, UTHM will continue to ensure quality education through innovative delivery and world class facilities so that no student will be left behind.

Apart from the above, the higher education in Malaysia has evolved from teacher-centered to student-centered learning. In addition, much initiatives have been rolled out towards the development of holistic and balanced graduates in terms of ethic, moral, knowledge, and skills. In order to improve the quality of learning and teaching, Industry Revolution 4.0 and work-based learning elements are embedded into the curriculum to ensure that academic programmes offered by UTHM continue to be relevant to the needs of current industry and market. Apart from that, knowledge and experience sharing between the key players of local and foreign industries in relation to industries and students as well as local community are delivered through CEO@Faculty programs.

UTHM with much effort and dedication will strive to become the champion of TVET. The existing academic programmes are aligned towards producing excellent TVET graduates. New programmes are developed to cater for new areas in TVET, which are seen to be the dominant workforce in Malaysia. It is hoped that all these efforts will further accelerate UTHM in becoming a global technopreneur university.

I do hope that all the initiatives which have been and will be rolled out by UTHM will give you valuable experiences in exploring knowledge and skills at UTHM. I would like to call out on you to take the opportunity to explore your own potential through various co-curricular activities and programmes prepared by UTHM. To achieve these aspirations, early preparations guided by this proforma will help you plan for your journey throughout your studies at UTHM. I hope you will be able to achieve excellent academic results and outstanding success.

Finally, I wish you all the best and pray that you will be successful in your studies at the university and be able to contribute to the development of the religion, race and nation.

"WITH WISDOM, WE EXPLORE"

PROFESSOR Dr. AZME BIN KHAMIS
Deputy Vice Chancellor (Academic and International)
Universiti Tun Hussein Onn Malaysia

Foreword from Dean

Assalammualaikum Warahmatullahi Wabarakatuh and Greetings.

It is my pleasure to welcome you to Faculty of Civil Engineering and Built Environment (FKAAB) for academic session 2021/2022. You have made the right decision in choosing Universiti Tun Hussein Malaysia (UTHM) to pursue your undergraduate education. The university fully accredited engineering programmes are some of the most sought-after programmes in the country.

The faculty through its Department of Civil Engineering has put together this Proforma for students reference. The Proforma contains Plan of Study for Bachelor of Civil Engineering with Honours programme as well as synopsis of all courses offered in the curriculum. Apart from that, you will also find the list of Faculty members and staff with their expertise.

Students should familiarize with courses offered in the programme curriculum, and together with your academic and career advisor (PAK), ensure that your plan of study of every semester complies with UTHM Academic Regulations (Bachelor Degree and Diploma programmes) in effect. Some courses have pre-requisites of their own (see the flow of courses provided with the plan of study). It is every student's responsibility to be aware of, and to comply with faculty and university regulations, policies, procedures and deadlines.

At times, continual quality improvement and other considerations may lead to changes to programme curriculum and its implementation; Faculty of Civil Engineering and Built Environment therefore reserves the right to make changes to the Proforma at any time.

The health crisis occasioned by COVID-19 pandemic has caused unprecedented social and economic disruption everywhere. In ensuring continuity of our teaching, learning and research activities, the Faculty continues to try its best to pursue these activities, which may include, among other things, online instructions.

I encourage you to take an active role in your own education. Strive for excellence in everything you do. The faculty will always assist and support you in the process of your education.

Best wishes for a successful academic year. #GTU2030

PROFESSOR Ir. Ts. Dr. MOHD IRWAN BIN JUKI
Dean
Faculty of Civil Engineering and Built Environment
Universiti Tun Hussein Onn Malaysia

Vision

To be a global technical university in sustainable technology and transportation.

Mission

Provide technical solution for industry and community based on tauhidic paradigm.

Education Philosophy of University

UTHM education and training, founded on the tauhidic paradigm, strive to produce competent, professional and entrepreneurial graduates, driven by advanced technologies for global development.

Logo of University

The logo of UTHM displays a proton, a book, a tiered mortar board (levels of learning), a book-rest and a shield.

Symbolism:

- Red — Bravery
- Blue — Collaboration
- Silver — Quality/ Prestige
- Book-rest — Knowledge
- Proton — Science and Technology
- Book — Knowledge
- Mortar board — Levels of study
- Circle — Resilient and related to global characteristics
- Shield — Confidence

The whole concept of the logo represents UTHM as a learning institution that supports knowledge expansion and development at all levels of study in science and technology.

Blue represents the close relationship among UTHM community in ensuring successful and resilient implementations of the University programmes as well as its education and research activities that are carried out for the benefit of mankind.

Red symbolises the adventurous nature of UTHM in exploring new fields to establish itself as a leader in the applications of science and technology. Thus, this reflects the spirit and self-esteem of the UTHM community.

Chancellor

Duli Yang Maha Mulia Sultan Ibrahim Ibni Almarhum Sultan Iskandar
Sultan Yang Dipertuan Bagi Negeri Dan Jajahan Takluk Johor Darul Ta'zim
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 Johor (Crown Prince of Johor, TMJ)
D.K., SPMJ, P.I.S

Pro Chancellor II

YBhg. Tan Sri Dr. Ali Hamsa

Board of Directors of University

Chairman

YBhg. Dato' Sri Ibrahim bin Ahmad

Members

YBhg. Prof. Datuk Ts. Dr. Wahid bin Razzaly
Vice Chancellor, Universiti Tun Hussein Onn Malaysia

YB. Dato' (Dr.) Haji Nooh bin Gadot
Advisor, Johor Islamic Religious Council

YBhg. Dato' Dr. Mohd. Padzil bin Hashim
Putra Business School, Universiti Putra Malaysia

YBhg. Dato' Ir. Dr. Haji Abdul Rashid bin Maidin
Managing Director, Pusat Bertauliah Akademik Profesional KOSAS

YBrs. Dr. Sharifah Adlina binti Syed Abdullah
Ministry of Finance Malaysia

YBrs. Mr. Shahril Anwar Mohd Yunos
Managing Partner, Virtus Capital Partners Sdn Bhd

YBrs. Ts. Zainab binti Ahmad
Chief Director, Jabatan Pendidikan Politeknik dan Kolej Komuniti, Kementerian Pengajian Tinggi

YBrs. Prof. Dr. Yusri bin Yusof
Professor, Universiti Tun Hussein Onn Malaysia

YBrs. Puan Elain Lockman
Chief Executive Officer and Co-Founder, Ata Plus Sdn Bhd

Alternate Member

YBrs. Ts. Haji Mohamad Amin bin Hamat
Deputy Chief Director, Ministry of Higher Education

Secretary

En. Abdul Halim bin Abdul Rahman
Registrar, Universiti Tun Hussein Onn Malaysia

Members of Senate

Chairman

YBhg. Prof. Datuk Ts. Dr. Wahid bin Razzaly
Vice Chancellor

Members

Prof. Dr. Azme bin Khamis
Deputy Vice Chancellor (Academic and International)

Prof. Dr. Mohd Shahir Shamsir bin Omar
Deputy Vice Chancellor (Research and Innovation)

Assoc. Prof. Ts. Dr. Lokman Hakim bin Ismail
Deputy Vice Chancellor (Student Affairs and Alumni)

Assoc. Prof. Ts. Dr. Mohd Kamarulzaki bin Mustafa
Provost UTHM Pagoh Campus

Assoc. Prof. Dr. Mas Fawzi bin Mohd Ali
Assistant Vice Chancellor (Strategic Planning and Corporate Relations)

Prof. Dr. Shahruddin bin Mahzan @ Mohd Zin
Dean, Centre for Graduate Studies

Prof. Ir. Ts. Dr. Mohd Irwan bin Juki
Dean, Faculty of Civil Engineering and Built Environment

Assoc. Prof. Dr. Rosli bin Omar
Dean, Faculty of Electrical and Electronic Engineering

Assoc. Prof. Ir. Ts. Dr Bukhari bin Manshor
Dean, Faculty of Mechanical and Manufacturing Engineering

Prof. Dr. Wan Fauzi@Fauziah binti Wan Yusoff
Dean, Faculty of Technology Management and Business

Assoc. Prof. Ts. Dr. Abdul Rasid bin Abdul Razzaq
Dean, Faculty of Technical and Vocational Education

Ts. Dr. Azizul Azhar bin Ramli
Dean, Faculty of Computer Science and Information Technology

Prof. Dr. Hashim bin Saim
Dean, Faculty of Applied Science and Technology

Assoc. Prof. Dr. Jumadi bin Abdul Sukor
Dean, Faculty of Engineering Technology

Assoc. Prof. Dr. Mohamad Zaky bin Noh
Dean, Centre for Diploma Studies

Assoc. Prof. Dr. Khairul Azman bin Mohamad Suhaimy
Dean, Centre for General Studies and Co-curricular

Assoc. Prof. Dr. Zailin Shah binti Yusoff
Dean, Centre for Language Studies

Prof. Dr. Erween bin Abdul Rahim
Director, Centre for Academic Development and Training

Assoc. Prof. Ts. Dr. Razali bin Hassan
Director, Malaysia Research Institute for Vocational Education and Training

Assoc. Prof. Dr. Amran bin Harun
Director, Institute for Social Transformation and Regional Development

Prof. Dr. Noridah binti Mohamad
Faculty of Civil Engineering and Built Environment

Prof. Dr. Mohammad Faiz Liew bin Abdullah
Faculty of Electrical and Electronic Engineering

Prof. Ir. Dr. Md Saidin bin Wahab
Faculty of Mechanical and Manufacturing Engineering

Prof. Dr. Yusri bin Yusof
Faculty of Mechanical and Manufacturing Engineering

Prof. Dr. Abdul Talib bin Bon
Faculty of Technology Management and Business

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

Prof. Dr. Nazri bin Mohd Nawi
Faculty of Computer Science and Information Technology

Prof. Dr. Rozaini bin Roslan
Faculty of Applied Science and Technology

Assoc. Prof. Dr. Abdul Mutalib bin Leman
Faculty of Engineering Technology

Ir. Ts. Dr. Raha binti Abdul Rahman
Industry Fellow

Assoc. Prof. Ts. Dr. Mohd. Farhan bin Md. Fudzee
Director, Information Technology Centre

En. Abdul Halim bin Abdul Rahman
Registrar / Secretary of Senate

Mr. Norzaimi bin Hamisan
Bursar

Mdm. Zaharah binti Abd Samad
Chief Librarian

Mdm. Norliah binti Yaakub
Head of Legal Advisor Office

Faculty of Civil Engineering and Built Environment

Vision

To be a global technical university in sustainable technology and transportation.

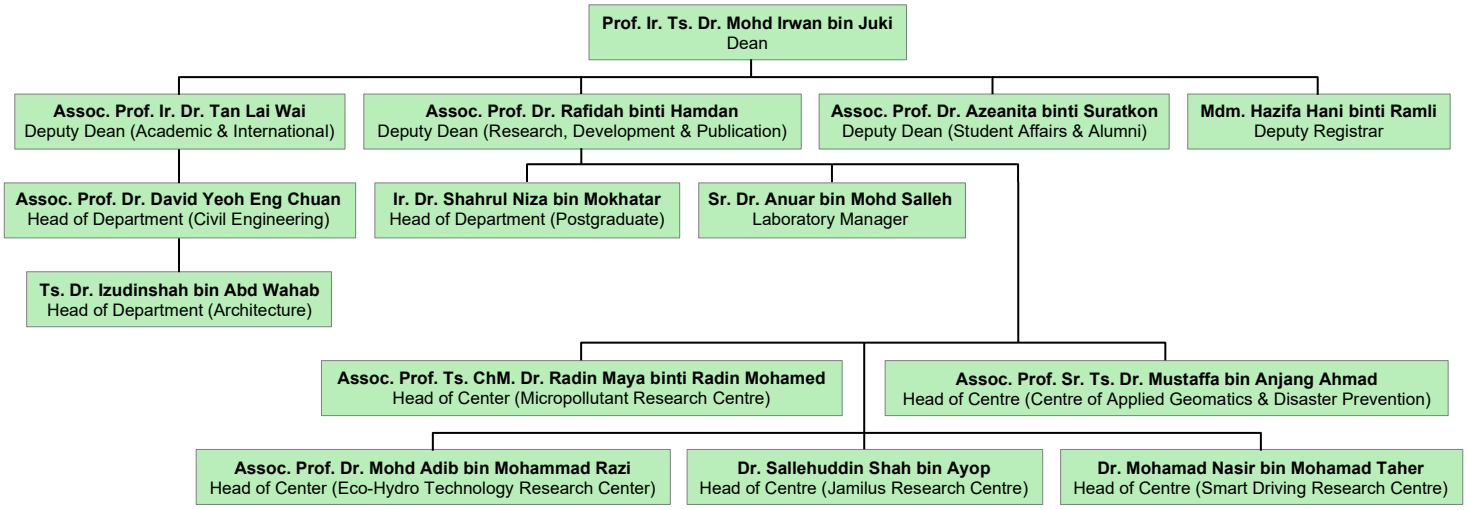
Mission

Provide technical solution for industry and community based on tauhidic paradigm.

Faculty of Civil Engineering and Built Environment (FKAAB), formerly known as Faculty of Civil and Environmental Engineering (FKAAS), was established on May 1, 2004 as a result of the merging of two departments, i.e. Department of Civil Engineering (Faculty of Engineering) and Department of Construction and Environmental Engineering Technology (Faculty of Engineering Technology). The Department of Civil Engineering dates back to September 13, 1993 when Polytechnic Staff Training Centre (PLSP) was set up, while Department of Construction and Environmental Engineering Technology was established on September 30, 2000 when Institut Teknologi Tun Hussein Onn (ITTHO) was upgraded to Kolej Universiti Teknologi Tun Hussein Onn (KUiTTHO) and subsequently to Universiti Tun Hussein Onn Malaysia (UTHM).

FKAAB offers academic programmes to students at bachelor and postgraduate levels. These programmes are specially designed towards achieving Faculty vision and mission. Boasting a pool of academicians and researchers with doctorates from all across the globe, including United Kingdom, Australia, Canada, Germany, Sweden, New Zealand, Japan and Hong Kong, FKAAB is a prime mover in conducting innovative and sustainable research in accordance with needs of the nation. With its top quality education and prowess in research and development, FKAAB strives to become a driving force in producing human capital, and a main center of reference in civil engineering and built environment. Qualities and global competitiveness of the programmes offered by FKAAB are proven with full accreditation by Board of Engineers Malaysia. The Board is full signatory of Washington Accord since June 18, 2009.

FKAAB consists of three (3) departments. The faculty is led by a Dean and assisted by three (3) Deputy Deans, as shown in the organisation chart.



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LEMBAGA JURUTERA MALAYSIA

(Penandatangan Penuh Washington Accord mula 18 Jun 2009)

SIJIL AKREDITASI

DENGAN INI MEMPERAKUKAN BAHAWA KURSUS PENGAJIAN
BACHELOR OF CIVIL ENGINEERING
WITH HONOURS
(4-Year Programme after STPM)

YANG DIKENDALIKAN OLEH:

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

TELAH MENDAPAT PENGIKTIRAFAN RASMI BAHAWA KELAYAKAN AKADEMIK YANG DIANUGERAHKAN ADALAH SELARAS DENGAN STANDARD DAN KUALITI YANG TELAH DITETAPKAN OLEH LEMBAGA JURUTERA MALAYSIA

PERAKUAN BAGI TAHUN BERGRADUAT
2017 HINGGA 2021

.....
DATO' SRI Ir. Dr. ROSLAN BIN MD TAHA
Yang Dipertua

.....
Ir. HIZAMUL-DIN AB. RAHMAN
Pendaftar

Penganugerahan Perakuan Akreditasi ini tertakluk kepada peraturan-peraturan dan syarat-syarat yang dinyatakan di sebelah.

Tarikh Perakuan Dikeluarkan:22.5.2017

Bachelor of Civil Engineering with Honours Programme Advisors

Adjunct Professor
Datuk Ir. Hj. Abdullah bin Isnin
Former Director-General
Department of Irrigation and Drainage Malaysia (DID)

Visiting Professor
Professor Dr. Obiya Hiroyuki
Department of Civil Engineering and Architecture
Saga University, Japan

External Examiner
Associate Professor Ir. Dr. Hjh. Che Maznah binti Mat Isa
Faculty of Civil Engineering
Universiti Teknologi MARA

Industry Advisors

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Senior Superintendant Civil Engineer
Public Works Department (JKR) Malaysia

Ir. Ooi Chee Liang
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Jurutera MTC Sdn Bhd

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Ir. Kueh Kim Meow
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Pn. Nazratul Munirah binti Hisam
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Mdm. Noorhayati binti Othman
Dip(Executive Secretary)(UiTM)

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Ir. Shamrul-Mar bin Shamsuddin
MEng(Structure & Construction)(UPM), BEng(Hons)(Civil Eng)(UTM)

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PhD(Microbiology)(USM), MSc(Microbiology)(Taiz Univ), BSc(Microbiology)(Taiz Univ)

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Ts. Dr. Alvin John Lim Meng Siang
PhD(Geotechnical Eng)(UTHM), BEng(Civil Eng)(UTHM)

Sr. Dr. Anuar bin Mohd Salleh
PhD(Civil Eng)(UTHM), MSc(Land Surveying)(UTM), BSc(Land Surveying)(UTM)
Dr. Azra Munirah binti Mat Daud
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PhD(Civil Eng)(UTHM), BEng(Civil Eng)(UTHM)

Dr. Faizal bin Pakir
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Mdm. Nadiah binti Khaled
BSc(Industrial Chemistry)(UTM)

Tc. Afandi bin Abu Bakar
Cert(Civil Eng-Construction)(POLISAS)

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Cert(Civil-Road & Water Works)(PUO)

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Mdm. Asmah binti Ibrahim
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STPM(Dato Menteri Air Hitam, Batu Pahat)

Name of Programme

Bachelor of Civil Engineering with Honours

Aims of Programme

The Bachelor of Civil Engineering with Honours programme offered by Faculty of Civil Engineering and Built Environment (FKAAB) aims to produce graduates who possess fundamental civil engineering knowledge, problem-solving skills, and team working skills in order to be employed by various organizations, including governmental agencies, consulting or design firms, construction firms, laboratories, project developers and institutes of higher learning.

Programme Educational Objectives (PEO)

The Bachelor of Civil Engineering with Honours programme prepares graduates to be:

PEO 1	**Knowledgeable** and **technically competent** in civil engineering discipline in-line with the industry requirement.
PEO 2	**Effective in communication** and demonstrate **good leadership** quality in an organization.
PEO 3	Capable to **solve civil engineering problems innovatively, creatively and ethically** through sustainable approach.
PEO 4	Able to demonstrate **entrepreneurship skills** and recognize the need of **lifelong learning** for successful career advancement

Programme Learning Outcomes (PLO)

By the time of graduations, students of the Bachelor of Civil Engineering with Honours programme are expected to know and be able to:

PLO	Key Idea	Description	Primary domain
1	**Engineering Knowledge (K)**	Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialisation as specified in WK1 to WK4 respectively to the solution of complex civil engineering problems.	Cognitive
2	**Problem Analysis (PA)**	Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences (WK1 to WK4).	Cognitive
3	**Design / Development of Solutions (DDS)**	Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (WK5).	Cognitive
4	**Investigation (INV)**	Conduct investigation of complex engineering problems using research-based knowledge (WK8) and research methods, including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.	Cognitive
5	**Modern Tool Usage (MTU)**	Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations (WK6).	Psychomotor
6	**The Engineer and Society (ESoc)**	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems (WK7).	Affective
7	**Environment and Sustainability (ESus)**	Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts (WK7).	Affective
8	**Ethics (ET)**	Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice (WK7).	Affective
9	**Individual and Team Work (TW)**	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.	Affective
10	**Communication Skills (CS)**	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	Psychomotor
11	**Project Management and Finance (PMF)**	Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.	Psychomotor
12	**Life Long Learning (LLL)**	Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	Affective

Study Plan

Table 1. Study Plan for Bachelor of Civil Engineering with Honours (BFF)

Year	Semester	Code of Course	Courses	Credit	Total
1	I	UHB 10102	English for Higher Education	2	19
		UQU 10303 / UQU 1***2 / UWB 1xxx2	* Philosophy and Current Issues / ** *Malaysian Studies and Culture* * Appreciation for Ethics and Civilisation / ** *Malay Language*	3/2	
		UQI 10102 / UQI 10202 / UQI 10902 / UQI 1***2 / UQI 11102	* Islamic Studies / Moral Studies / ** *Islam in Malaysia* Appreciation for Ethics and Civilisation / ** *Civilizational Studies in Asia*	3/2	
		UQ* 1xxx1	Co-Curriculum I	1	
		BFC 10502	Civil Engineering Materials	2	
		BFC 15003	Calculus	3	
		BFC 10103	Static and Dinamic	3	
		BFC 10403	Fluid Mechanics	3	
	II	UQU 1xxx3 / UQU 10303 / UQU 1xxx2 / UWB 11002	* Philosophy and Current Issues / ** *Malaysia Studies and Culture* * Appreciation for Ethics and Civilisation / ** *Malay Language*	2	18
		UQ*1xxx1	Co-Curriculum II	1	
		UQ* 1xxx2	Foreign Language	2	
		BFC 10303	Engineering Drawing and CAD	3	
		BFC 20601	Material and Fluid Laboratory	1	
		BFC 20903	Mechanics of Materials	3	
		BFC 21103	Hydraulic	3	
		BFC 25103	Engineering Mathematics	3	
2	I	UQI 10902 / UQI 1***2 /	*Islam in Malaysia/* Appreciation for Ethics and Civilisation	2	17
		UHB20102	Essential Academic English	2	
		BFC 25203	Numerical Method Mathematics	3	
		BFC 21201	Hydraulics and Mechanics of Material Laboratory	1	
		BFC 21403	Structure Analysis	3	
		BFC 21702	Geotechnic I	2	
		BFC 32002	Hydrology	2	
		BFC 31802	Highway Engineering	2	
	II	BFC 20703	Engineering Geomatic	3	18
		BFC 20802	Computer Programming	2	
		BFC 21002	Construction Engineering	2	
		BFC 21303	Geologi Kejuruteraan	3	
		BFC 35403	Geotechnic II	3	
		BFC 34303	Civil Engineering Statistic	3	
		BFC 34702	Structures Design	2	
	III	BFC 21502	Geomatic Practice	2	2

Year	Semester	Code of Course	Courses	Credit	Total
3	I	UHB 30102	English For Technical Purpose	2	18
		BFC 31901	Geotechnic and Structure Laboratory	1	
		BFC 32202	Engineers and Society	2	
		BFC 32302	Traffic Engineering and Safety	2	
		BFC 32403	Environmental Engineering	3	
		BFC 32602	Mechanical and Electrical System	2	
		BFC 32703	Sustainable Construction Engineering	3	
		BFC 34803	Reinforced Concrete Design	3	
	II	BFC 32501	Transportation and Environmental Laboratory	1	17
		BFC 34502	Entrepreneurship	2	
		BFC 23702	Creativity and Innovation	2	
		BFC 35303	Water System Design and Management	3	
		BFC 35503	Contract and Estimation	3	
		BFC 43201	Civil Engineering Software Application	1	
		BFC 43502	Occupational Health and Safety	2	
		BFC 44903	Structural Steel Design	3	
	III	BFC 32904	Industrial Training	4	4
4	I	UHB 40102	English For Occupational Purposes	2	12
		BFC 43402	Final Year Project I (Prerequisite = Passed 96 credits)	2	
		BFC 43303	Intergrated Design Project	3	
		BFC 43103	Foundation Engineering	3	
		BFC 44602	Engineering Economy	2	
	II	BFC 43604	Final Year Project II	4	13
		BF* 4XY03	Elective I (Prerequisite = Passed 114 credits)	3	
		BF* 4XY03	Elective I (Prerequisite = Passed 114 credits)	3	
		BF* 4XY03	Elective I (Prerequisite = Passed 114 credits)	3	
				Total Credit Hours	**138**

Note:
*For local students
**For international students

Table 2. List of elective courses in Bachelor of Civil Engineering with Honours (BFF)

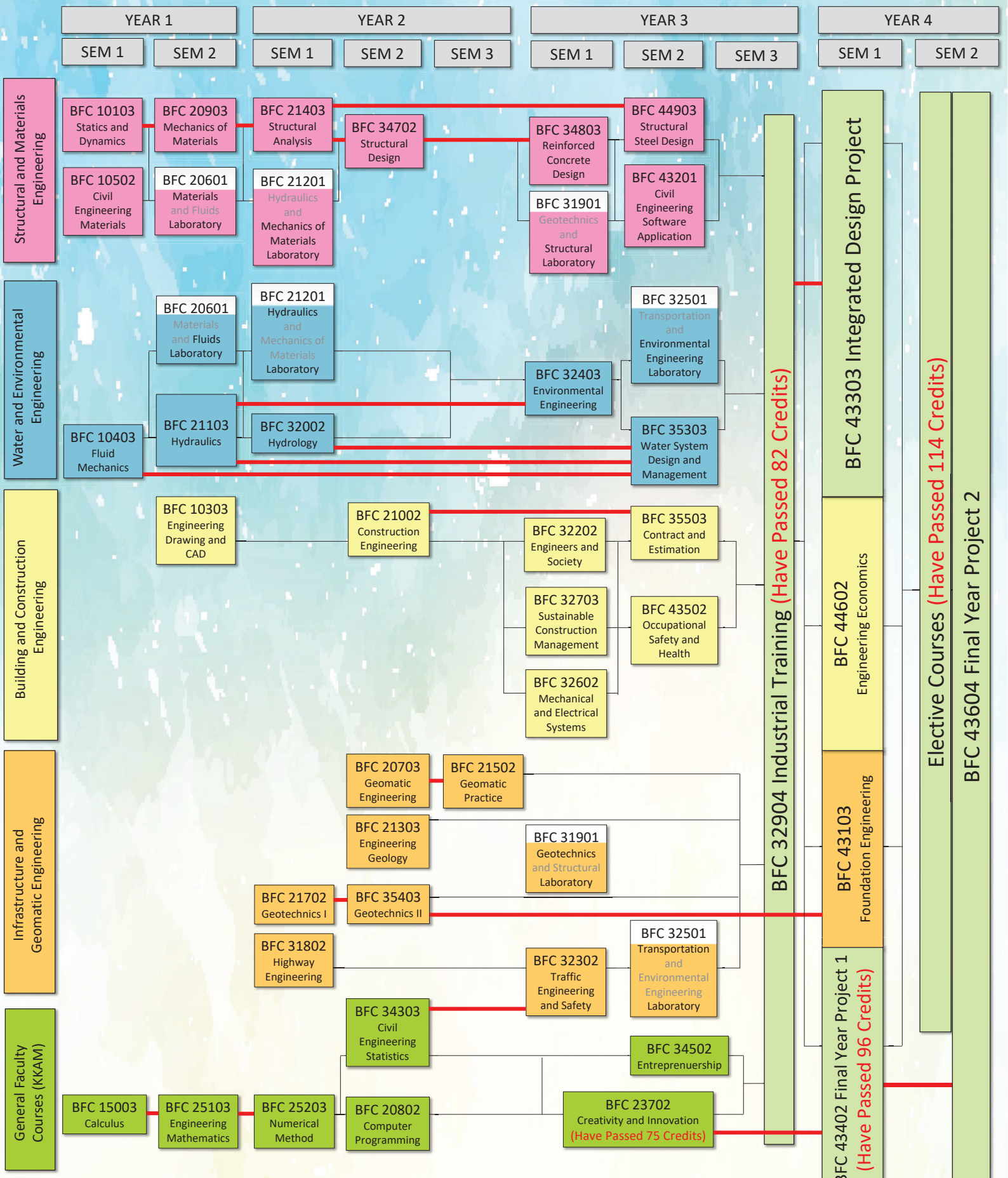
Field	Code of Course	Elective	Credit
Environmental	BFA40103	Environmental Management	3
	BFA40203	Design of Water Supply	3
	BFA40303	Solid Waste and Hazardous Waste Management	3
	BFA40403	Design of Waste Water Engineering	3
	BFA40503	Air Pollution Prevention and Control	3
	BFA40803	Air Pollution Engineering	3
Building	BFB40203	Tall Building Construction	3
	BFB40503	Intelligent Building	3
	BFB41003	Building Services	3
	BFB41103	Acoustics and Lighting	3
	BFB40903	Building Maintenance	3
Geotechnic	BFG40103	Advanced Engineering Foundation	3
	BFG40203	Advanced Geotechnic	3
	BFG40303	Geo-Environment	3
	BFG40403	Geo-Synthetic Design	3
	BFG40503	Engineering Geophysics	3
	BFG40603	Soft Soil Engineering	3
	BFG40703	Applied Geomatics	3
	BFG40803	Geographical Informations Systems For Civil Engineering	3
Construction	BFP40103	Construction Planning and Scheduling	3
	BFP40203	Construction Plant Management	3
	BFP40503	Project Financial Management	3
	BFP40603	Industrialized Building System	3
Structure and Material	BFS40103	Advanced Structural Analysis	3
	BFS40303	Pre-stressed Concrete Design	3
	BFS40603	Concrete Technology	3
	BFS40903	Advanced Structure Design	3
	BFS41003	Finite Element Analysis	3
	BFK40303	Advanced Structural Timber Design	3
	BFS41203	Data Science and Application	3
	BFS41303	Offshore Structure Design	3
Transportation	BFT40203	Pavement Engineering	3
	BFT40303	Transportation Engineering	3
	BFT40503	Advanced Traffic Engineering	3
	BFT40603	Road Safety Engineering	3
Water Resources	BFW40103	Water Resources Engineering	3
	BFW40303	Coastal and Harbour Engineering	3
	BFW40403	Groundwater Engineering	3
	BFW40503	Urban Stormwater Management	3
	BFW40603	Sediment Transport	3

FACULTY OF CIVIL ENGINEERING AND BUILT ENVIRONMENT (FKAAB)
DEPARTMENT OF CIVIL ENGINEERING

UTHM
Universiti Tun Hussein Onn Malaysia

BACHELOR OF CIVIL ENGINEERING WITH HONOURS (BFF)

FLOW OF COURSES



Note:
Red Line Indicates Flow of Prerequisite Courses

OCTOBER 2020

Synopsis of Programme Courses – Year 1 Semester I

UHB 10100/UHB 10200 English For Higher Education

Synopsis

This course exposes students to English language learning in higher education and enhances their study skills. Students have oppoturnities to learn about using technological affordances in listening to lectures, note taking, library and internet research, conducting academic group discussions, preparing and delivering presentations, and writing an academic report. The course also provides oppoturnities for students to acquire learning skills that facilitate the transition to tertiary education. Aspects of English language oral and written skills that are most relevant to students in their academic work will be reinforced.

References

1. Agosti, M. (2008). Information access through search engines and digital libraries. Berlin: Springer, Z699 .I534 2008
2. Galanes, G. J. (2013). Effective group discussion: Theory and practice (14th ed.). New York: McGraw-Hill. HM736. G34 2013
3. Greasley, P. (2011). Doing essays and assignments. Essential tips for students. Thousand Oaks, CA: Sage Publication. LB1047.4 .G73 2011
4. Lim, P. L. (2014). Listening & notetaking skills 2 (4th ed.). Boston: National Geographic learning, PE1128 .L55 2014
5. Van Blerkom, D.L. (2005). College reading and study strategies. Belmont, CA: Wadsworth. LB2395. 3 . V36 2005
6. Wong, L. (2012).Essential study skills (7th ed.). Boston, MA:Wadsworth Cengage Learning. LB1049, W66 2012
7. Zhang, F. (2012). Computer-enhanced and mobile assisted language learning: Emerging issues and trends, hershey, PA:Information Science Reference. P53.28 . C65 2012

UQI 11202/UQI11302 Philosophy and Current Issues

Synopsis

Kursus merangkumi hubungan ilmu falsafah dengan Falsafah Pendidikan Kebangsaan dan Rukunegara. Penggunaan falsafah sebagai alat untuk memurnikan budaya pemikiran dalam kehidupan melalui seni dan kaedah berfikir serta konsep insan. Topik utama dalam falsafah iaitu epistemologi, metafizik dan etika dibincangkan dalam konteks isu semasa. Penekanan diberi kepada falsafah sebagai asas bagi menjalin dialog antara budaya serta memupuk nilai sepunya. Di hujung kursus ini pelajar akan mampu melihat disiplin-disiplin ilmu sebagai satu badan ilmu yang komprehensif dan terkait antara satu sama lain.

References

1. Al-Attas, S.M. Naquib. (1991). The Concept of Education in Islam. Kuala Lumpur: ISTAC.
2. Al-Farugi, I.R. (1994). Al-Tawhid: Its Implications for Thought and Life, (2nd Ed.). Herndon: IIIT.
3. Phillips, D.C. (Ed.) (2014). Encyclopaedia of Educational Theory and Philosophy, (1st Ed.). SAGE Publication.
4. Dzulkifli, A.R. & Rosnani, H. (2019) Pentafsiran Baharu Falsafah Pendidikan Kebangsaan dan Pelaksanaannya Pasca 2020. Kuala Lumpur: IIUM Press.
5. Hospers, J. (1997). An Introduction to Philosophical Analysis, (4th Ed.). London: Routledge.
6. Mitchell, H.B. (2011). Roots of Wisdom: A Tapestry of Philosophical Traditions, (6th Ed.). Wadsworth: Cengage Learning.
7. Osman Bakar. (1999). The Classification of Knowledge in Islam. Cambridge, U.K.: The Islamic Texts Society.
8. Rosnani Hashim. (2017). Revitalization of Philosophy and Philosophical Inquiry in Muslim Education. Kull of Education, IIUM.
9. Solomon, R.C. & Higgins, K.M. (2010). The Big Questions: A Short Introduction to Philosophy, (8th Ed.). Wadsworth: Cengage Learning.
10. 1Weiming, T. & Ikeda, D. (2011). New Horizons In Eastern Humanism: Buddhism, Confucianism and The Quest for Global Peace. London: I.B.Tauris.

UQU 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. Andaya, B.W. and Andaya, L. Y. (1982). "A History of Malaysia." London: Macmillan. DS596 .A52 2001
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. 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
6. Nazaruddin Mohd. Jali (2003). "Malaysian Studies : Nationhood and Citizenship." Petaling Jaya : Pearson Prentice Hall.
7. Yahaya Ismail (1989). "The Cultural Heritage of Malaysia." Kuala Lumpur : Dinamika Kreatif Sdn. Bhd.xxxxxxx

UQU10702/UQU10802 Appreciation for Ethics and Civilisation

Synopsis

Kursus ini menerangkan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenalpasti sistem, tahap perkembangan, kemajuan dan kebudayaan sesuatu bangsa dalam mengukuhkan kesepaduan sosial. Selain itu, perbincangan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan professional. Penerapan amalan pendidikan berimpak tinggi (HIEPs) yang bersesuaian digunakan dalam penyampaian kursus ini. Di hujung kursus ini pelajar akan dapat menghubungkaitkan etika dan kewarganegaraan berminda sivik.

References

1. Shamsul Amri Baharuddin. (2012). Modul Hubungan Etnik Edisi Dua. Bangi: Institut Kajian Etnik. Universiti Kebangsaan Malaysia. [DS595 .M62 2007].
2. Dworkin, A.G. (1999). The minority report: An introduction to racial, ethnic and gender relations. Fort Worth: Harcourt Barce College Pub. [E184.A1 .M56 1999].
3. Holst, F. (2012). Ethnicization and identity construction in Malaysia. New York: Routledge. [DS595 .H64 2012 v. 12].
4. Wan Hashim Wan Teh. (2011). Hubungan Etnik di Malaysia. Kuala Lumpur: ITNM. [DS595.W36 2011]
5. Zaid Ahmad. (2010). Hubungan Etnik di Malaysia. Oxford Fajar: Shah Alam. [DS595 .H822010].
6. Mohd. Ashraf Ibrahim. (2004).Gagasan Bangsa Malayan yang Bersatu 1945-57. Bangi : Penerbit UKM. [DS597.M37 2004]
7. Noor Aziah Mohd. Awal. (2003). Pengenalan kepada Sistem Perundangan di Malaysia. Petaling Jaya: International Law Book Services. [KPG68.N66 2003]
8. Eow Boon Hin. 2008. Moral Education. Shah Alam: Longman. (LC268.E48 2008)
9. Ahmad Khamis. 1999. Etika Untuk Institusi Pengajian Tinggi. Kuala Lumpur: Kumpulan Budiman. (LC315.M3.A35 1999)
10. "Mohd Nasir Omar. 1986. Falsafah Etika; Perbandingan Islam dan Barat. Kuala Lumpur: JPM. (BL240.3.H87 2009)

UQI 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 (2001), Manusia dan Islam. 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: 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)

UQI 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. Ahmad Khamis. (1999). Etika untuk Institusi Pengajian Tinggi. Kuala Lumpur. Kumpulan Budiman. (LC 315 .M3 .A35 1999)
2. Eow Boon Hin. (2002). Moral Education. Longman. (LC 268 .E48 2008)
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. Hussain Othman. (2009). Wacana Asasi Agama dan Sains. Batu Pahat: Penerbit UTHM. (BL 240.3 H87 2009a)
5. Mohd Nasir Omar (1986). Falsafah Akhlak. Bangi: Penerbit UKM. (BJ 1291 .M524 2010)

UQI 10902 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]
   Sazelin Arif, (2007), Tamadun Islam dan tamadun Asia, Shah Alam, Selangor: McGraw Hill. [BP190.5 .T35 2007]
2. 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]
3. Mohd Liki Hamid, (2003), Pengajian Tamadun Islam, Bentong: PTS Publications. [DS36.85 .P46 2003]
4. 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]

UQ* 1xxx1 Co-Curriculum I

Synopsis

This course is offered in the form of multiple choice of activities for Diploma students and undergraduates. Three categories of activities offered are Sports and Recreational, Club/ Associations and Uniform Bodies.

BFC 10502 Civil Engineering Material

Synopsis

Civil Engineering materials have an important role to play for sustainable construction. This course introduces students various types of civil engineering materials including its classification, properties, laboratory testing, manufacturing process and applications in civil engineering. Scope of study includes cement, aggregates, concrete, bricks and masonry, timber, steel and other construction materials.

References

1. William P. Spence; Construction Materials, Methods and Techniques, Second Edition: Thomson 2007.
2. M. S. Mamlouk, J. P. Zaniewski; Materials for civil and construction engineers; Pearson Prentice Hall, 2006.
3. H. Zhang; Building Materials in Civil Engineering; Woodhead Publishing Limited, 2010.
4. J. Khatib; Sustainability of Construction Materials; Woodhead Publishing Limited, 2009.
5. E. V. Amsterdam; Construction Materials for Civil Engineering 4th. Edition; Juta & Co Ltd.; 2008.

Synopsis of Programme Courses – Year 1 Semester II

BFC 15003 Calculus

Synopsis

This course covers basic engineering mathematics: differentiation: derivative of single variable functions, chain rule, L'Hopital rule and extremum value problem; integration: integration as antiderivative, techniques of integration; The applications of differentiation and integration; and First order differential equation (ODE).

References

1. Abd. Wahid Md. Raji, Hamisan Rahmat, Ismail Kamis, Mohd Nor Mohamad, Ong Chee Tiong (2009). Calculus for Science and Engineering Students. Malaysia: UTM
2. Abd. Wahid Md Raji (2013). The first couse of calculus for science and engineering students. Malaysia: UTM Publication [QA303 .F57 2013]
3. Abd Wahid Md. Raji (2018). Differential equations for engineering students. Malaysia: UTM Publication [TA347.A32 2018]
4. Stewart, James (2012). Calculus. Belmont, CA : BCengage Learning. [QA303.2 .S73 2012]
5. Anton, Howard (2005). Calculus. New York : John Wiley [QA303 .A576 2005]
6. O'Neil, Peter V. (2012). Advanced Engineering Mathematics. Canada : Cengage Learning [TA330 .O53 2012]

BFC 10103 Static and Dynamic

Synopsis

The fundamental concepts of equilibrium with different types of forces, work and energy are essential in solving static and dynamic structure element. The principles knowledge of static and dynamic such momentum, friction and gravity are widely used in our real life. This course introduces students to apply Newton's Law and understand the basic knowledge of centroid and gravity of a body. Scope of the study includes moment and couples, center of gravity, moment of inertia of a body and impulse and momentum of a rigid body.

References:

1. Costanza, Francesco; Engineering Mechanics: Statics and Dynamics, McGraw-Hill; 2010. (Call no. UTHM library: TA350 .C67 2010)
2. Bedford, Anthony; Engineering mechanics: statics and dynamics; 5th Edition, 2005. (Call no. UTHM library: TA350 .B42 2005)
3. Beer, Ferdinand P.; vector mechanics for engineers: static and dynamics, 9th Edition, McGrraw-Hill, 2009. (Call no. UTHM library: TA350 .V42 2009)
4. R.C. Hibbeler; Engineering mechanics: static and dynamics, 11th Edition, Pearson, 2007. (Call no. UTHM library: TA350 .H52 2007)
5. Norashidah Abd Rahman, Noorli Ismail, Mohd Hilton Ahmad, Module Static and Dynamic, 2nd Edition, 2009.
6. Blundell, Mike, The Multibody Systems Approach to Vehicle Dynamics, Elsevier, 2015 (e-book).

BFC 25203 Fluid Mechanics

Synopsis

Basic principles of fluid mechanics help engineers to study and analyze all sorts of fluid-related problems, ranging from statics and dynamics of fluid to flow in pipe networks. This course introduces students to the principles of fluid mechanics and application of the concept to typical civil engineering problems including flow in pipes, fluid measurement, and computation of fluid forces. Scope of study includes Properties of Fluids: concept of fluid mechanics, definition of fluids, properties of fluids; Hydrostatic Pressure and Buoyancy: pressure head, pressure measurements, hydrostatic force on plane surfaces, buoyancy and stability; Basic Fluid Equations: continuity, momentum and energy equations, applications of Bernoulli equation, flow measurements, forces of fluids; Flow in Pipes: Reynolds number, Hagen-Poiseuille and Darcy-Weisbach equations, friction loss, minor losses; Pipe Network: hydraulic and energy grade lines, fluid flow in pipes, flow in series and parallel pipes, Hardy-Cross method; Dimensional Analysis and Similarity: basic dimensions, Buckingham theorem, dimensionless numbers, geometric, kinematic and dynamic similarities.

References

1. White, F. M. (2011). Fluid Mechanics, 7th ed. New York: McGraw-Hill.Call number: TA357.W44 2011.
2. Cengel, Y. A. & Cimbala, J. M. (2010). Fluid Mechanics: Fundamentals and Applications, 2nd ed. Boston, MA: McGraw-Hill. Call number: TA357.C46 2010.

3. Crowe, C. T. (2010). Engineering Fluid Mechanics, 9th ed. Chichester: John Wiley. Call number: TA357.E53 2010.
4. Munson, B. R., Young, D. F. & Okiishi, T. H. (2010). Fundamentals of Fluid Mechanics, 6th ed. Hoboken, NJ: John Wiley.Call number: TA357. M86 2010.
5. Janna, W. S. (2010). Introduction to Fluid Mechanics, 4th ed. Boca Raton: CRC Press.Call number: TA357.J36 2010.
6. Cimbala, J. M. & Cengel, Y. A. (2008). Essentials of Fluid Mechanics: Fundamentals and Applications. New York: McGraw-Hill. Call number: TA357.C54 2008.

UQ* 1xxx1 Co-Curriculum II

Synopsis

This course is offered in the form of multiple choice of activities for Diploma students and undergraduates. Three categories of activities offered are Sports and Recreational, Club/ Associations and Uniform Bodies.

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. Blacwell 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.

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. Heiner Schenke, 2004. Basic German: a grammar and workbook. London: Routledge. [PF3112.5. 35 2004]
4. Robert Di Donato 2004. Deutsch, Na Klar! Boston: McGraw-Hill. [PF3112. D36 2004]

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. 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]

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

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. Asmah Hj. Omar (1985). Kamus Ayat .Eastview. PL5091 .A85 1985 rd
2. Asmah Hj. Omar. (1993). Susur Galur Bahasa Melayu. DBP : KL. PL5127 .A85 1993N1
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

UWB 11102 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

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.
2. Bahasa Arab UMR 1312. Batu Pahat: Penerbit UTHM. (Call no.: PJ6115 .M445 2008 a)
3. Mohd Hisyam bin Abdul Rahim. 2005. Senang Berbahasa Arab. Batu Pahat: Penerbit KUiTTHO. (Call no: PJ6115 .M44 2005 a)
4. Ab. Halim Mohammed; Rabiyah Hajimaming; Wan Muhammad Wan Sulong. 2007. Bahasa Arab Permulaan. Serdang: Penerbit UPM. (Call No.: PJ6065 .A32 2007)
5. Fuad Ni'mat. 1973. Mulakhass qawa'id al-lughatul 'arabiyyah. Damsyik: Darul Hikmah. (Call no.: PJ5161 .F62 1973)

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. 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, jilid2. 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)

BFC 10303 Engineering Drawing and CAD

Synopsis

This course introduces students to use AutoCAD Software in producing engineering drawing, application to computer-aided design (CAD), constructions of basic geometrical shape, orthographic projection, isometric projection and CAD application in architecture and civil engineering drawing

References

1. Hamad, Munir M. (2015). AutoCAD 2015: Beginning and Intermediate. Dulles, Virginia : Mercury Learning and Information. [T386.A97.H352015]
2. Yarwood, Alf. (2013). Introduction to AutoCAD 2013 : 2D and 3D Design. New York : Routleedge. [T385.Y39 2013]
3. Wohlers, Terry T. 2013. Applying AutoCAD 2013. New York, NY : McGraw-Hill, 2013. T385 .W63 2013
4. Leach, James A. (2012). AutoCAD 2012 Instructor : A Student Guide to Complete Coverage of AutoCAD's commands and features. Mc Graw Hill. [T385.L42 2012]
5. Douglas Smith and Antonio Ramirez. (2009). Technical drawing 101 with AutoCAD: a multidisciplinary curriculum for the first semester, Prentice Hall. [T385 .S64 2009]
6. Mark Dix and Paul Riley, Discovering AutoCAD. (2008). Prentice Hall. [T385 .D62 2008]
7. Cecil Jensen, Jay D. Helsel, Dennis R. Short. (2008). Engineering Drawing and Design, McGraw-Hill. [T353 .J46 2008]
8. David A. Madsen, David P. Madsen and J.Lee Turpin. (2007) Engineering Drawing and Design, Delmar Thomson Learning [T353 .M325 2007]

BFC 20601 Material and Fluid Laboratory

Synopsis

The application of material and fluid testing in Civil Engineering is compulsory in construction field. This course introduces students to implement some testing which is studied and related to subject Materials of Civil Engineering and Fluid Mechanics. Scope of study in Material Test consists of 6 tests including concrete, steel, wood and brick test. Fluid Test consists of 6 tests including jet striking test, flow test, Bernoulli's Theorem and friction test.

References

1. Mamlouk, Michael S; Materials for civil and construction engineers; Prentice Hall, 2011. (TA403.M35 2011)
2. Shan, Somayaji; Civil Engineering Materials. Prentice Hall, 2001. (TA403 .S66 2001 N1)
3. S.D., Hasan; Civil Engineering Materials and Their Testing; Oxford : Alpha Science International, 2006. (TA403 .H37 2006)
4. Fimmemore, E. John Franzini, Joseph B.; Solution manual to accompany fluid mechanics with engineering applications; McGraw-Hill, 2002. (TA357 .F553 2002 ca)
5. Finnemore, E. John; Fluid mechanics with engineering applications; McGraw-Hill, 2002.(TA357 .F56 2002 N1)

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BFC 20903 Mechanics of Materials
(Pre-requisite: BFC10103 Static dan Dynamic)

Synopsis

Mechanics is the body of knowledge that deals with the relationships between forces and the motion of points through space, including the material space. Material science is the body of knowledge that deals with the properties of materials, including their mechanical properties. This course introduces students to simplify the affect of material and geometric properties when the structure is loaded with outside and internal forces. Scope of this course includes the analysis and design of structural members subjected to axial loads, torsion and bending, as well as such fundamental concepts as stress and strain, deflections of beams, behaviour of columns and statically determinate plane truss.

References

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2. James M. Gere, Barry J. Goodno, Mechanics of Materials, 9th Edition, Cengage Learning, New York: 2018 [TA405 .G47 2013 – 8th Ed]
3. Hibbler, R.C., Mechanics of Materials, 10th Edition, Pearson: 2017
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5. Ansel C. Ugural, Mechanics of Materials, John Wiley & Son, US: 2008
6. William F. Riley, Leroy D. Sturges and Don H. Morris, Mechanics of Materials, 6th Edition, Wiley Hoboken, NJ: John, 2007

BFC 21103 Hydraulics

Synopsis

In Hydraulics, understanding of fluid characteristics and behavior in various applications in civil engineering such as flow in canal for irrigation, hydraulic structures, pump and turbine is important. The course introduces students to the application of fluid mechanics principles in civil, water and environmental engineering, especially of hydraulic structures such as channel and weir. Scope of study includes Introduction to Open Channel Flow; Uniform and Non-Uniform Flow in Open Channel; Specific Energy and Control Section; and Hydraulic Structures and Machines.

References

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4. Subramanya, K. (2009). Flow in Open Channels. Boston: McGraw-Hill. Call number: TC175 .S92 2009
5. Jain, S.C. (2001). Open-Channel Flow. New York: John Wiley. Call number: TC175 .J34 2001
6. French, R.H. (1985). Open-Channel Hydraulics. New York: McGraw-Hill. Call number: TC175 .F78 1985
7. Sturm, T.W. (2001). Open Channel Hydraulics. Boston: McGraw-Hill. Call number: TC175 .S78 2001
8. Chanson, H. (2004). The Hydraulics of Open Channel Flow: An Introduction. Amsterdam: Elsevier. Call number: TC175 .C42 2004

BFC 25103 Engineering Mathematics
Pre-requisite: BFC15003 Calculus

Synopsis

The course covers the basic concepts of second order differential equations which the methods of solution including Laplace Transform method. Multivariable functions introduces the fundamental of the mathematical concepts which will be used in solving various civil engineering problems include the domain and range, level curves, contour lines, 3D graphs, application of partial derivatives. Furthermore, multiple integrals also include the double and triple integrals (cartesian, cylindrical and spherical coordinate concepts) for finding mass and volume. Application of multiple integrals also covers the finding of mass, center of mass and moment of inertia for lamina and solids. Vector valued functions and vector calculus covers the concept of finding gradient, directional derivatives, unit normal vector of surfaces, divergence and curl, line integral and surface integral of scalar and vector field, independent path and conservative vector field, Green, Gauss and Stokes theorem.

References

1. Abd. Wahid Md. Raji, Mohd Nor Mohamad. (2018). Differential Equations for Engineering Students. Malaysia: Penerbit UTM Sdn Bhd
2. Abd. Wahid Md. Raji, Hamisan Rahmat, Ismail Kamis, Mohd Nor Mohamad, Ong Chee Tiong. (2013). The first course of Calculus for Science and Engineering Students. Malaysia: Penerbit UTM Press
3. Stroud, K. A., Booth, D. J. (2007). Advanced Engineering Mathematics. 4th Ed. USA: Palgrave Macmillan.
4. Stroud, K. A., Booth, D. J. (2007). Engineering Mathematics. 6th Ed. USA: Palgrave Macmillan.
5. Howard Anton, Irl Bivens, Stephen Davis. (2002). Calculus. 7th Ed. New York: John Wiley [QA303.A57 2002)
6. Robert T. Smith and Roland B. Minton. (2007). Calculus Early Transcendental Function. 3rd Ed. New York: McGraw-Hill [QA303.2.S644 2007)

Synopsis of Programme Courses – Year 2 Semester I

UHB 20102 Essential Academic English

Synopsis

This course enhances students' English language skills, emphasizing listening and reading skills necessary for academic contexts. The course provides opportunities for students to learn the strategies to help them understand information from documentaries, lectures and paper presentations and develop analytical listening to differentiate between facts and opinions. This course also provides opportunities for students to develop skills to critically respond to academic materials such as journal articles.

References

1. Bowen, E. (2010). Listening in: Broadcasts, speeches and interviews.Edinburgh: Edinburgh University Press.
2. Fairbairn, G. J. (2011). Reading, writing and reasoning: A guide for students. Maidenhead: Open University Press.2011.
3. J. (2002). Reading for academic success: Reading and strategies. Boston: Houghton Mifflin. LB2395.3 .L48 2002.
4. Metcalfe, M. (2006). Reading critically at university. Los Angeles: Sage.LB2395.3 .M47 2006.
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6. L. C. (2005). Exploring content 1: Reading for academic success. White Plains, NY: Longman. PE1122 .S64 2004.
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BFC 25203 Numerical Method
(Pre-requisite: BFC25103 Engineering Mathematics)

Synopsis

This course covers numerical solutions to solve nonlinear equations, system of linear equations, polynomials; numerical differentiation and integration, eigen value, ordinary differentiation and partial differentiation equations, and an introduction to one dimensional finite element problem.

References

1. D. V. Griffiths, I. M. Smith. (2006). Numerical methods for engineers, 2th Edition. Boca Raton, FL: Chapman & Hall.
2. J. N. Sharma. (2004). Numerical methods for engineers and scientists, Pangbourne: Alpha Science International.
3. Jaan Kiusalaas. (2005). Numerical methods in engineering with MATLAB, Cambridge: Cambridge University Press.
4. John H. Mathews, Kurtis D. Fink. (2004). Numerical methods using MATLAB, 4th Edition. US Upper Saddle River, NJ: Pearson Education.
5. Laurene Fausett. (2002). Numerical methods using mathCAD, Upper Sadddle River, New Jersey.

BFC 21201 Hydraulics And Mechanics Of Material Laboratory

Synopsis

The application of hydraulic and mechanics of material testing in civil engineering is commonly applied in this course to help the student in making a clear understanding about the relationship between the theory and experimental findings. Hydraulics testing consists of 4 tests which include basic hydrology and infiltration rate tests, flow in open channel test, Pelton and Francis turbine tests, series and parallel pump tests. Material mechanics testing consists of 5 tests which include shear force in a beam, bending moment in a beam,force in a statically determinate cantilever truss, buckling of struts, span deflection.

References

1. James M. Gere. (2006). Mechanics of materials. Australia: Thomson. Call number: TA405 .G47 2006
2. Lencastre, A. and Holmes, P. (1987). Handbook of Hydraulic Engineering. Chichester: Ellis Horwood. Call number: TC145 .L43 1987
3. Bruce R. Munson, Donald F. Young and Theodore H. Okiishi. (2006). Fundamentals of Fluid Mechanics. 5th Edition; John Wiley & Sons. Call number: TA357 .M86 2002 n.1
4. R.C. Hibbeler. (2002). Structural Analysis [multimedia], 5th Edition; Prentice Hall, USA. Call number: TA645 .H52 2002 CD1

5. R.C. Hibbeler. (1997). Mechanics of Materials. 3rd Edition. Prentice Hall, USA. Call number: TA405 .H43 1997
6. Ned.H.C.Hwang and Robert J. Houghtalen. (1996). Fundamentals of Hydraulic Engineering System. 3rd edition. Prentice Hall, USA. Call number: TC160 .H83 1996

BFC 21403 Structural Analysis
(Pre-requisite: BFC20903 Mechanics of Materials)

Synopsis

Structural analysis is one of the important aspects need to be studied before designing the structure. This course introduces student to the concept of structural analysis of elastic and inelastic behavior of trusses, beams and frames. Scope of the study includes deformable of statically determinate and indeterminate structure, influence line and plastic analysis.

References

1. Hibbeler, R.C.; Structural Analysis; 8th Edition"; Prentice Hall; USA; 2012. [TA645 .H52 2012]
2. Kenneth M. Leet, Chia-Ming Uang and Anne M. Gilbert; Fundamentals of Structural Analysis; 3th Edition; Mac-Graw Hill; 2008. [TA645 .L34 2008]
3. Jack C. McCormac; Structural Analysis: Using Classical and Matrix Methods; Wiley; 4th edition; 2007. [TA645 .M36 2007]
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6. Megson, T. H. G.. Structural and Stress Analysis, Elsevier Science & Technology, 2014. ProQuest Ebook Central,https://ebookcentral-proquest-com.ezproxy.uthm.edu.my/lib/uthm-ebooks/detail.action?docID=5754476.

BFC 21702 Geotechnic 1

Synopsis

Geotechnical engineering is the branch of civil engineering concerned with the engineering behavior of earth materials. Geotechnical engineering includes investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered. This course introduces to student basic properties of soil, classification of soil and also behaviour of soil. Student also can analyze problem occur in soil and proposed solution for each problem. The scopes of this course are composition and soil classification, soil compaction, permeability, soil shear strength and in situ stresses.

References

1. Das, Braja M. (2007), "Principles Of Geotechnical Engineering, 7th Edition)", Thomson, Canada. (Library shelf number: TA 710.D37 2010)
2. Budhu, M. (2007), "Soil Mechanics & Foundations (2nd. Edition)", John Wiley & Sons, Inc., United States of America. (Library shelf number: TA 710.B83 2007)
3. Shroff, Arvind V. and Shah, Dhananjay L. (2003), "Soil Mechanics and Geotechnical Engineering", A. A. Balkema, Netherlands. (Library shelf number: TA 710.S57 2003)
4. Coduto, Donald P., Yeung, Man-Chung, and Kitch, William A. "Geotechnical Engineering: Principles and Practices", Upple Saddle River, Pearson. (Library shelf number: TA 705.C82 2011)
5. Ishibashi, Isao, and Hazarika, Hemanta, "Soil Mechanics Fundamentals", Boca Raton: CRC Press. (Library shelf number: TA 710.I83 2011)

BFC 32002 Hydrology

Synopsis

Hydrology is the study of the earth water including their movement, chemistry and distribution. In civil engineering, hydrology applies scientific knowledge and mathematical principles to solve water-related problems in society regarding quantity, quality and availability. This course introduces students to physical processes of hydrology, measurement and collection of data, model conceptualization, data analysis and design synthesis. Scope of study includes Basic Concept of Hydrology: introduction to hydrology, hydrologic cycle and water balance, and hydrological data; Precipitation: Introduction, rainfall depth and intensity, precipitation data analysis; Evaporation, Transpiration and Infiltration: factors of meteorology, evaporation, transpiration and evapotranspiration, methods of evapotranspiration assessment: Penman and Thornthwaite formula, infiltration capacity, factors of infiltration: infiltration index; Surface Runoff: catchment characteristics, runoff determination, river flow determination – mean and mid-section methods, peak flow estimation- rational method, intensity-duration-frequency curve; Analysis of Hydrograph: runoff

components, hydrograph separation, unit hydrograph, application of unit hydrograph; Flood Control: flood and river control, river flow routing – Muskingum method, reservoir routing – Puls method; Groundwater: introduction, groundwater parameters, well hydraulic and one-dimensional groundwater steady flow.

References

1. Teaching and Learning Module: BFC32002 (Hydrology), 2nd Edition, UTHM Publisher, UTHM
2. McCuen R. H. Hydrologic analysis and design, 3rd Edition. Prentice Hall, 2005.
3. Mays L.W. Water Resources Engineering. John Wiley, 2005
4. Patra K.C. Hydrology and Water Resources Engineering, 2nd Edition. Alpha Science International Ltd, 2008.
5. Chin D.A. Water Resources Engineering, 2nd Edition. Prentice Hall New York, 2006
6. Urban stormwater short course: application of MSMA for sustainable urban drainage system (SUDS). Penang: Universiti Sains Malaysia, 2005
7. JPS. Urban Stormwater Management Manual for Malaysia. Publications Unit, Ministry of Agriculture and Fisheries Malaysia, 2000.

BFC 31802 Highway Engineering

Synopsis

This Highway Engineering course is intended for undergraduate students in civil engineering. The course will provide an essential engineering knowledge in highway engineering which covers the necessary fundamentals needed for practitioners at the entry level to industry. This course introduces students to the application of highway engineering as part of civil engineering design, construction and maintenance works. In line with its main task, the scope of this course covers central topics, ensuring an adequate grasp of theoretical concepts of highway materials, pavement design, highway construction, highway drainage and pavement maintenance.

References

1. Garber N.J, Hoel L.A., (2002), Traffic and Highway Engineering (3rd Edition), California, Brooks/Cole.
2. Wright P.H & Dixon K.K., (2004), Highway Engineering (7th Edition), John Wiley & Sons (New York).
3. Flaherty C.A., (2002),The Location, Design, Construction & Maintenance of Pavements (4th Edition), Butterworth Heinemann, United Kingdom.
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8. JabatanKerja Raya Malaysia, Standard Specification for Road Works, Ibu Pejabat JKR, Kuala Lumpur, 2008
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11. Jabatan Kerja Raya, ArahanTeknik (Jalan) 5/85, Manual On Pavement Design, Ibu Pejabat JKR, Kuala Lumpur,
12. Jabatan Kerja Raya, ArahanTeknik (Jalan) 5/85 (Pindaan 2013), Manual On Pavement Design, IbuPejabat JKR, Kuala Lumpur.
13. Jabatan Kerja Raya, Addendum STJ 5/85 (Pindaan 2013): Manual for the Structural Design of Flexible Pavement (Surat Arahan KPKR Bil 28/2017), IbuPejabat JKR, Kuala Lumpur.

Synopsis of Programme Courses – Year 2 Semester II

BFC 20703 Engineering Geomatic

Synopsis

Surveying or geomatic is important knowledge since their early civilization. In early geomatic knowledge was applied in reconciling the property boundary within the neighborhood. Nowadays, survey technology has developed fast and widely used in civil engineering work. Among others are in site planning, construction and highway maintenance, railroad planning, building and bridge construction, dam construction, drainage works, water supply and sewage system, and so forth. The scope of engineering geomatic includes traverse survey, leveling work, a detailed engineering survey, route survey, and earthwork volume calculation.

References

1. Kavanagh, B.F. and Glenn Bird S.J.; Surveying: Principles & Applications, 6th Edition; Prentice Hall, USA; 2009. (TA545.K37 2009)
2. Kavanagh, B.F.; Surveying with construction application; Prentice Hall, USA; 2010. (TA625.K38 2010)
3. Paul R. Wolf and Charles D. G.; Elementary Surveying-An Introduction to Geomatics; 10th Edition; Prentice Hall; 2002. (TA545.W64 2002)
4. Stephen V. E.; A guide to understanding land surveys, Hoboken, NJ: J. Wiley; 2009. (TA551.E87 2009)
5. Watson, P.; Surveying and Engineering: Principles and Practice; Francis 10th Edition, Addison Wesley; 2008. (TH438.S97 2008)

BFC 20802 Computer Programming

Synopsis

As a fundamental subject, this course will equip the students with theory and practice on problem solving techniques by using the structured approach. Students will be required to develop programs using programming language under windows platform, in order to solve simple to moderate problems. They will be familiarize with the pre-processor instructions, constants and variables, data types, input and output statements, text files, control structures: sequential, selection and loop, built-in and user-defined functions, one dimension and two dimension array, and structure.

References

1. Robertson, L. (2006). Simple Program Design: A Step-by-Step Approach.Thomson.
2. Summerfield, M. (2009). Programming in Python 3: A Complete Introduction to the Python Language. Addison-Wesley.
3. Jones, B and Beazley, D. (2013). Python Cookbook. O'reilly.
4. Jones, M. (2015). Python for Complete Beginners. CreateSpace Independent Publishing Platform.
5. Maarof, M. A., (2006). Logik Pengaturcaraan Komputer. Penerbit Universiti Teknologi Malaysia.

BFC 21002 Construction Engineering

Synopsis

Construction engineering emphasized on planning and design of management for building construction stage and sequence. This course assists students to establish the knowledge and understanding method of construction in building components. Scopes of study are site investigation & earthwork, foundation, building works and infrastructures.

References

1. R.L. Peurifoy et al, Construction Planning, Equipment and Methods, 6th Edition. Mc Graw Hill, 2002. Call number : TH145.P48 2011 /2002
2. S.W. Nunnally, Construction Methods and Management**,** 5th Edition, Prentice Hall, 2001. TH145.N86 2011 / 2007/ 2004/ 2001
3. Tim Howarth, Paul Watson, Construction Safety Management, 2009, TH443. H68 2009
4. Roger Greeno (2004). Building Construction Handbook, 5th Edition; London: Butterworth-Heinemann. TH151. C58 2004/ 2001
5. Gil L. Taylor, Construction Codes and Inspection Handbook, 2006, TH 439 2006
6. Frederick S. Merrit, Jonathan T, Ricketts. . Building Design and Construction Handbook,2006, TH439.T39 2006

BFC 21303 Engineering Geology

Synopsis

Engineering geology is a subfield of geological study concerning about the geological inputs and the uses of the information to solve the engineering problems. This subject applies the geologic sciences to engineering practice for the purpose of assuring that the area geologic factors affecting the design and construction of engineering works are recognized and adequately provided for. This subject gives the exposure to the students to investigate and provide geologic and geotechnical recommendations, analysis, and design associated with human development. The scope of this course are introduction and background of earth geology, the formation processes of earth structures, formation, classification and characteristics of rock engineering, the scale of geology time and the application of the stratigraphy, structural geology and the principle of rock mechanics.

References

1. Plummer & Carlson. Physical Geology. 12th Ed. New York, McGraw Hill, 2008. (QE28.2 .P58 2003).
2. Chernicoff and Whitney. An Introduction to Physical Geology. 4th Ed. New Jersey; Pearson; 2007 (QE28.2 .C43 2007).
3. Duncan C. Wylie and Christopher W. Mah. Rock Slope Engineering: Civil and mining. 4th Ed. New York: Spon Press; 2004 (TA706 .W94 2004).
4. Bell F.G. Engineering Geology. Butterworth-Heinemann; 2007 (TA705 .B44 2007).
5. Terry R. West; Geology Applied to Engineering; Waveland Pr Inc; 2010 (TA705 .W47 1995 N1).
6. Bell F.G.; Engineering Geology and Construction; Taylor & Francis; 2004 (TA705 .B44 2004).
7. Noel Simons, Bruce Menzies and Marcus Matthews; Soil and Rock Slope Engineering. 1st Ed. London. Thomas Telford Publishing; 2001 (TA710 .S55 2001).
8. Kolymbas D.; Tunneling and Tunnel Mechanics: A Rational Approach to Tunneling. Germany; Springer; 2005 (TA805 .K64 2005).
9. Hoek E, Kaiser P.K, Bawden W.F; Support of Underground Excavations in Hard Rock. 4th Ed. Rotterdam; A. A Balkema; 2000 (TA740 .H64 2000).

BFC 35403 Geotechnic II
(Pre-requisite: BFC21702 Geotechnic 1)

Synopsis

Geotechnical engineering is the branch of civil engineering concerned with the engineering behavior of earth materials. Geotechnical engineering includes investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered. This course introduces to student basic properties of soil, classification of soil and also behaviour of soil. Student also can analyze problem occur in soil and proposed solution for each problem. The scopes of this course are composition and soil classification, soil compaction, permeability, soil shear strength and in situ stresses.

References

1. Das, Braja M. (2007), “Principles Of Geotechnical Engineering, (7th Edition)”, Thomson, Canada. (Library shelf number: TA 710.D37 2010)
2. Budhu, M. (2007), “Soil Mechanics & Foundations (2nd. Edition)”, John Wiley & Sons, Inc., United States of America. (Library shelf number: TA 710.B83 2007)
3. Shroff, Arvind V. and Shah, Dhananjay L. (2003), “Soil Mechanics and Geotechnical Engineering”, A. A. Balkema, Netherlands. (Library shelf number: TA 710.S57 2003)
4. Coduto, Donald P., Yeung, Man-Chung, and Kitch, William A. “Geotechnical Engineering: Principles and Practices”, Upple Saddle River, Pearson. (Library shelf number: TA 705.C82 2011)
5. Ishibashi, Isao, and Hazarika, Hemanta, “Soil Mechanics Fundamentals”, Boca Raton: CRC Press. (Library shelf number: TA 710.I83 2011)

BFC 34303 Civil Engineering Statistics
(Pre-requisite: BFC15003 Calculus)

Synopsis

This course covers a review on descriptive statistics, probability, random variables and probability distributions, special probability distributions, sampling and estimation theory, significance testing, Chi-square and distribution-free tests, linear regression and correlation and analysis of variance (ANOVA).

References

1. Navidi, William Cyrus (2015). Statistics for engineers and scientists. New York: McGraw-Hill [QA276.4 .N38 2015]

2. Brase, Charles Henry (2015). Understandable statistics: concepts and methods. Boston: Cengage Learning Brooks/Cole [QA276 .B72 2015]
3. Devore, Jay (2014). Applied statistics for engineers and scientists. Stamford: Cengage Learning [QA276 .D48 2014]
4. Jackson, Sherry L. (2014). Statistics: Plain and simple. Bellmont: Wadsworth [QA276.12 .J32 2014]
5. McClave, James T. (2013). Statistics. Upper Saddle River: Pearson/Prentice-Hall [QA276.12 .M34 2013]
6. Montgomery, Douglas C. (2012). Engineering Statistics. Chicester: John Wiley [QA276.12 .M66 2012]
7. Milton, J. Susan (2012). Probability and statistics principles and applications. Singapore: McGraw-Hill [TA340 .M54 2012]
8. Spiegel, Murray R., Schiller, John J., Srinivasan, R. Alu (2009) Probability and Statistics. E-book

BFC34702 Structural Design
(Pre-requisite: BFC21403 Structural Analysis)

Synopsis

Structural design is a process to identify the rigidity, stability, strength and capacity of structures. The basic objective is to produce a structure that has the capability of resisting all applied loads without failure during its intended life. This course will introduce students to the basic design philosophies of different structural system. Scopes of study include an introduction to the basic design concept of limit state design and code of practices, planning and design process of different structural element, structural loading and analysis, design of reinforced concrete beam, design of a timber beam and finally the introduction of prestressed concrete structure.

References

1. H. Gulvanessian, J. A. Calgaro and M. Holicky. Designers' guide to EN 1990 : Eurocode : Basis of Structural Design. London : Thomas Telford, 2002. (TA658 .G84 2002).
2. H. Gulvanessian, Paolo Formichi, J.A. Calgaro. Designers guide to Eurocode 1 : Actions on Buildings : EN1991-1-1 and -1-3 to -1-7. London: Thomas Telford, 2009. (TA658.2 .G84 2009).
3. Bill Mosley, John Bungey and Ray Hulse. Reinforced Concrete Design to Eurocode 2. Palgrave Macmillan. 6th edition. 2007. (TA683.2 .M68 2007).
4. Prab Bhatt, T.J. MacGinley and Ban Seng Choo; Reinforced Concrete: Design Theory and Examples. Taylor & Francis. 3th , 2005. (TA683.2 .M33 2005).
5. William M C McKenzie and Binsheng Zhang; Design of Structural Timber, 2nd Edition, Palgrave MacMillan, 2007 (TA 666.M534.2007)
6. Chanakya Arya, Design of Structural Elements; Concrete, Steelwork, Masonry and Timber Designs to British Standard and Eurocodes, 2nd Ed., Taylor and Francis Group, 2009. (TA658 .A79 2009)
7. Jack Porteous and Abdy Kermani, Structural timber design to Eurocode 5, Blackwell, 2007. (TA666 .P67 2007)
8. Antoine E. Naaman ; Prestressed Concrete Analysis and Design: Fundamentals; Techno Press; 2nd edition; 2004. (TA683.9)
9. Benaim, Robert; The design of prestressed concrete bridges : concepts and principles; Taylor & Francis; 2008. (TG340 .B46 2008)

Synopsis of Programme Courses – Year 2 Semester III

BFC 21502 Geomatic Practice

Synopsis

The course contains basic and advance skill practice which applied intensively in certain period of time. Student will be expose to real work condition and latest instrument and the proper work procedure in geomatic field which related to civil engineering project. The practice also enhances the student softskills. Scope of study include horizontal control survey, vertical control survey, detail plan production, design the development plan dan setting out.

References

1. Kavanagh, B.F. and Glenn Bird S.J.; Surveying: Principles & Applications, 6th Edition; Prentice Hall, USA; 2009. (TA545.K37 2009)
2. Kavanagh, B.F.; Surveying with construction application; Prentice Hall, USA; 2010. (TA625.K38 2010)
3. Paul R. Wolf and Charles D. G.; Elementary Surveying-An Introduction to Geomatics; 10th Edition; Prentice Hall; 2002. (TA545.W64 2002)
4. Stephen V. E.; A guide to understanding land surveys, Hoboken, NJ: J. Wiley; 2009. TA551.E87 2009
5. Watson, P.; Surveying and Engineering: Principles and Practice; Francis 10th Edition, Addison Wesley; 2008. (TH438.S97 2008)

Synopsis of Programme Courses – Year 3 Semester I

UHB 30102 English For Technical Purposes

Synopsis

This course aims to prepare students with the skills to wirte reports and express ideas or opinions competently. Students will be equipped with persuasive strategies that can be applied to writing technical reports. The course will also enable them to practice these techniques by drafting and collaborating to produce assigned tasks. The students are also expected to orally present their proposals and written reports befre an audience or a panel examiners.

References

1. Bogdan, R. C. (2007). Qualitative research for education: An introduction to theory and methods (5th ed.). Boston, MA: Pearson. LB1028 .B63 2007
2. Chandra, S. (2013). Research methodology. Oxford, U.K: Alpha Science Intl Ltd. H62. C42 2013
3. Grix, J (2010). Informations skills: Finding and using the right resources. New York: Palgrave Macmillan.
4. Farquhar, J. (2012). Case study research for business. London, England:Sage. HD30.4 .F37 2012.
5. Hittleman, D. R. (2006). Interpreting educational research: An introduction for consumers of research (4th ed.). Upper Saddle River, NJ:Pearson. LB1028. H57 2006.
6. Newby, P. (2014). Research methods for education (2nd ed.). Abingdon: Routledge. LB1028. N48 2014
7. Neville, C. (2010). The complete guide to referencing and avoiding plagiarsm. Maidenhead: Open University Press. PN171.F56 .N48 2010
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10. Somekh, B. (2006). Action research: a methodology for change and development. Bershire: Open University Press. LB1028.24 .S65 2006

BFC 31901 Geotechnic and Structure Laboratory

Synopsis

Laboratory tests and field tests are normally required during any phase of a construction project to ensure quality assurance and that project is being done according to specifications. The testing is performed to reduce risk associated with poor materials also, it provides reasonable engineering assurance to the project owner that the materials and construction methods meet the project specifications. This course introduce to the student procedure according to specific standard for geotechnical and structural laboratory test. The scopes of the course are soil classification, permeability, shear strength, consolidation, on site soil density measurement for geotechnical laboratory test. For structural laboratory test consists of influence line, statically determinate space frame, statically indeterminate truss and plastic analysis.

References

1. Budhu, M., “Soil Mechanics & Foundations (2nd. Edition)”, John Wiley & Sons, Inc., USA. 2007
2. Das, Braja M., “Fundamentals of Geotechnical Engineering (2nd. Edition)”, Thomson, Canada. 2005.
3. Das, Braja M., “Principles Of Geotechnical Engineering, Adapted International Student Edition”, Thomson, Canada. 2007.
4. Robert W. D., “Soil Testing Manual”. 2011.
5. Liu Evert. “Soil Properties Testing, Measurement and Evaluation”. 2003
6. Harry H. West and Louis F. Geschwindner, “Fundamentals of Structural Analysis (2nd Edition)”, John Wiley & Sons, Inc., USA. 2002.
7. Jack C. McCormac, “Structural Analysis: Using Classical and Matrix Methods (4th Edition)”, John Wiley & Sons, Inc., USA. 2006.
8. Hibbeler, R.C., “Structural Analysis; 5th Edition”; Prentice Hall; USA. 2002.

BFC 32202 Engineer and Society

Synopsis

Engineers work to develop safe, viable and economic solutions to practical problems, by applying mathematics, scientific knowledge and ingenuity while considering technical constraints. The work of engineers is the link between perceived needs of society and commercial applications. This course introduces the student to the importance of engineers in society, and the role of engineers in an organisation, within the engineering profession and in various sectors. The scope of this course includes introduction to the engineering profession, professionalism in engineering, engineers and their organisations, humanisation of engineering, research and development in engineering, and engineers and globalisation.

References

1. Vesilind, P.A., Engineering Peace and Justice: The Responsibility of Engineers to Society, Springer; New York, 2010. (TA157 .V474 2010).
2. Harris, C.E., Pritchard, M.S., Rabis, M.J., James, R., Englehardt, E., Engineering Ethics: Concepts and Cases, Wadsworth Cengage Learning, Massachusetts, 2014. (TA157 .H37 2014).
3. Vesilind, P.A., Gunn, A.S., Hold Paramount: The Engineer's Responsibility to Society (2nd Edition), Cengage Learning, Stamford, 2011 (TA157 .G86 2011).
4. Martin, M.W., Introduction to Engineering Ethics (2nd Edition), McGraw-Hill, 2010 (TA157 .M37 2010)
5. Whitbeck, C., Ethics in Engineering Practice and Research, Cambridge University Press, 2011 (TA157 .W44 2011).
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BFC 32302 Traffic Engineering And Safety

Synopsis

Traffic Engineering is a branch of civil engineering dealing with the design, operation and management of transportation facilities. Traffic operations and management are vital in traffic engineering, so that users move smoothly and efficiently on the facilities. Hence, this course will provide essential engineering knowledge in traffic engineering, which covers the fundamentals required for practitioners at the entry level to the industry. This course introduces students to applications of traffic engineering as part of civil engineering design and construction to accommodate future traffic demand. The scope of study includes the importance of traffic engineering, traffic flow elements, highway capacity analysis, traffic management and control, traffic safety, road safety audit and intersection design.

References

1. Fred L. Mannering, Scott S. Washburn and Walter P. Kilareski, Principles of Highway Engineering and Traffic Analysis, 4th Edition, John Wiley & Sons, New York, USA, 2009.
2. Garber N.J, Hoel L.A., Traffic and Highway Engineering, 4th Edition, University of Virginia, Cengage Learning, 2009.
3. Roger P. Roess, Elena S. Prassas and William R. McShane. Traffic engineering, 3rd Edition, Pearson Education, New Jersey, 2004.
4. Highway Capacity Manual (HCM). Transportation Research Board (TRB), Washington D.C., 2000.
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6. Public Work Department. Road Safety Audit: Guidelines for the Safety Audit of Roads and Road Project in Malaysia, 2nd Edition, 2002.
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BFC 32403 Environmental Engineering

Synopsis

Scope of environmental problem. Population and economic growth. Environmental effect. Effects on energy consumption. Effects of human activities to environment. Environmental chemistry. Microbiology. Ecology. Natural water purification. Water treatment and supply. Water pollution and wastewater treatment. Solid waste management.

References

1. Davis, M.L. and Cornwell, D.A. (2013). Introduction to Environmental Engineering, 5th Ed., McGraw-Hill. TD145. D384 2013.
2. Gilbert M. Masters and Wendel P.Ela (2008). Introduction to Environmental Engineering and Sciences, 3rd Edition. New Jersey: Pearson Prentice Hall.TD 145.M37 2008.
3. Mackenzie L. Davis and Susan J. Masten (2008). Principles of Environmental Engineering and Sciences, New York: McGraw-Hill.TD145.D38 2008.
4. Peavy, H.S., Rowe, D.R. and Tcobanoglous, G (1985). Environmental Engineering. International Edition, McGraw-Hill.TD145.P43 1985.
5. Jerry A. Nathanson (2003). Basic Environmental Technology, 4th Edition. New Jersey.Prentice Hall. TD 145. N37 2003.
6. P. Aarne Vesilinda and Susan M Morgan (2004). Introduction to Environmental Engineering, 2nd Edition. USA: Thomson. TD145. V47 2004.

BFC 32602 Mechanical and Electrical System

Synopsis

Mechanical and electrical (M&E) system is essential for effective and efficient building operation. This course introduces students to the fundamental of M&E system scope and impact, fundamental of building physics, ventilation system, fire safety and building transportation system, electrical distribution and, water supply and discharge system.

References

1. William K.Y. Tao. 2009. Mechanical and Electrical Systems in Buildings, 2nd Edition. Prentice Hall. New Jersey. Call Number: TH6010 .T36 2005.
2. David V. Chadderton. 2000. Building Services Engineering, 3rd Edition. E & FN. London. Call Number: TH6010 .C42 2000.
3. Roger Greeno. 2007. Building Services, Technology and Design. Pearson, London. Call Number: TX955 .G73 1997.
4. Benjamin Stein. 2000. Building Technology (Mechanical and Electrical). John Wiley. Call Number: TH6010 .S83 1997.
5. Greeno, R., Hall, F., Hall, F., & Greeno, R. (2013). Building services handbook.
6. ProQuest Ebook Central, https://ebookcentral-proquest-com.ezproxy.uthm.edu.my/lib/uthm-ebooks/detail.action?docID=1244785."
7. Lenz, B., Schreiber, J., Stark, T., & Schreiber, J. (2013). Sustainable building services : Principles - systems - concepts.
8. ProQuest Ebook Central, https://ebookcentral-proquest-com.ezproxy.uthm.edu.my/lib/uthm-ebooks/detail.action?docID=1075545.

BFC 32703 Sustainable Construction Management

Synopsis

The construction industry is regarded as an essential and highly visible contributor to the process of economic growth of a country. Nevertheless, the adverse impacts of this industry to the environment have brought awareness and acceptance of the concept of sustainable construction worldwide for a more responsible approach to the environment. This course introduces students to the overall planning, coordination and control of construction projects from inception to completion aimed at meeting the client's needs, by producing projects that are functional and viable, and completed in a timely manner at a minimum cost that meets the quality and environmental standards. Scope of the course includes sustainable construction management, sustainable construction technical guidelines, sustainable building management, management concept, project organization, project planning and scheduling, project time control, project cost system, project cost control, resources management and risk management.

References

1. Project Management Institute. (2013). A guide to the project management body of knowledge (PMBOK guide)- Fifth Edition. Newtown Square, Pa: Project Management Institute.
2. Charles J. K. (2008). Sustainable Construction: Green Building Design and Delivery. Hoboken, NJ: John Wiley. [TH880 .K52 2008]
3. Thomas, E. G. (2008). Contractor's guide to green building construction : management, project delivery, documentation and risk reduction. Hoboken, NJ: John Wiley. [TH880 .G52 2008]
4. Kopec, D. A. (2009). Health, Sustainability, and the Built Environment. New York: Fairchild Books. [TH880 .K66 2009]

5. Brandon, P. S. & Lombardi, P. (2011). Evaluating Sustainable Development in the Built Environment. Hoboken, NJ: Wiley-Blackwell. [HT241 .B72 2011]
6. Leffers, M. R. (2010). Sustainable construction and design. Boston: Prentice-Hall. [TH880 .L43 2010]
7. Hansen, S. J. & Brown J. W. (2011). Sustainability Management Handbook. Boca Raton, FL: Distributed by Taylor & Francis. [TA190 .S97 2011]
8. Kubba, S. (2010). Green Construction Project Management and Cost Oversight. Burlington, MA: Architectural Press. [TH880 .K824 2010]
9. Halpin, D. W. & Bolivar, S. (2011). Construction Management. Hoboken, N.J.: Wiley. [HD9715.U52 .H34 2011]
10. Uly Ma. (2011). No Waste: Managing Sustainability in Construction. (https://ebookcentral-proquest-com.ezproxy.uthm.edu.my/lib/uthm-ebooks/detail.action?docID=771005)
11. Paul Chan and Rachel Cooper. (2010). Constructing Futures : Industry Leaders and Futures Thinking in Construction. (https://ebookcentral-proquest-com.ezproxy.uthm.edu.my/lib/uthm-ebooks/detail.action?docID=624703)
12. Steve Goodhew. (2016). Sustainable Construction Processes : A Resource Text. (https://ebook central-proquest-com.ezproxy.uthm.edu.my/lib/uthm-ebooks/detail.action?docID=4505303).

BFC 34803 Reinforced Concrete Design
(Pre-requisite: BFC 21403 : Structural Analysis BFC 34703 : Structural Design)

Synopsis

This course is continuation from BFC21402 (Structural Design) and mainly focuses on reinforced concrete design. This course introduces students to the of reinforced concrete structures design according to the relevant code of practices. Scope of study includes analysis of frame structure, column design, staircase design, footing and retaining wall design.

References

1. Bill Mosley, John Bungey and Ray Hulse; Reinforced Concrete Design to Eurocode 2, Seventh Edition, Palgrave Macmillan; 2012
2. Bill Mosley, John Bungey and Ray Hulse. Reinforced Concrete Design to Eurocode 2. Palgrave Macmillan, 6th Edition, 2007. [TA683.2 .M68 2007]
3. Prab Bhatt, T.J. MacGinley, and Ban Seng Choo. Reinforced Concrete: Design Theory and Examples, Taylor & Francis, 3rd Edition, 2006. [TA683.2 .M33 2005]
4. H. Gulvanessian, J. A. Calgaro and M. Holicky. Designers' Guide to EN 1990: Eurocode: Basis of Structural Design. London: Thomas Telford, 2002. [TA658 .G84 2002]
5. H. Gulvanessian, Paolo Formichi, J.A. Calgaro. Designers Guide to Eurocode 1: Actions on Buildings: EN1991-1-1 and -1-3 to -1-7. London: Thomas Telford, 2009. [TA658.2 .G84 2009]
6. Chanson, H. (2004). The Hydraulics of Open Channel Flow: An Introduction. Amsterdam: Elsevier. [TC175 .C42 2004]

Synopsis of Programme Courses – Year 3 Semester II

BFC 32502 Transportation and Environmental Engineering Laboratory

Synopsis

Traffic Engineering is a branch of civil engineering dealing with the design, operation and management of transportation facilities. Traffic operations and management are vital in traffic engineering, so that users move smoothly and efficiently on the facilities. Hence, this course will provide essential engineering knowledge in traffic engineering, which covers the fundamentals required for practitioners at the entry level to the industry. This course introduces students to applications of traffic engineering as part of civil engineering design and construction to accommodate future traffic demand. The scope of study includes the importance of traffic engineering, traffic flow elements, highway capacity analysis, traffic management and control, traffic safety, road safety audit and intersection design.

References

1. Fred L. Mannering, Scott S. Washburn and Walter P. Kilareski, Principles of Highway Engineering and Traffic Analysis, 4th Edition, John Wiley & Sons, New York, USA, 2009.
2. Garber N.J, Hoel L.A., Traffic and Highway Engineering, 4th Edition, University of Virginia, Cengage Learning, 2009.
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5. ArahanTeknikJalan 8/87: A Guide on Intersection Design, Public Works Department, Malaysia, 1986.
6. Public Work Department. Road Safety Audit: Guidelines for the Safety Audit of Roads and Road Project in Malaysia, 2nd Edition, 2002.
7. Interim Guide On Identifying, Prioritising and Treating Hazardous Locations on Roads in Malaysia, Public Works Department, Malaysia, 1995.
8. Road Engineering Association Malaysia (REAM). Guidelines on Traffic Control and Management Devices, Part 4: Pavement Marking and Delineation, REAM-GL8, 2004

BFC 34502 Entrepreneurship

Synopsis

This course covers various topics related to basic entrepreneurship skills and knowledge including an introduction to entrepreneurship, entrepreneurs' characteristics and motivation, screening a viable business opportunity, formation of a business, financial management and managing business. Students will also be exposed to the real business environment as well as the trends and new challenge in the business world.

References

1. Ariffin, S, Hamidon, S (2017). Introduction to Entrepreneurship. Oxford Fajar, Kuala Lumpur
2. Johri, Nitin (2014). Entrepreneurship, Random, New Delhi. Call Number HD62.5 .J64
3. Barker, Melissa S (2013). Social media marketing : a strategic approach. South Western, OH : Cengage. Call Number HF5415.1265 .S62 2013
4. Charles E. Bamford, Garry D. Bruton (2011). Entrepreneurship : a small business approach. New York : McGraw-Hill. Call number HD62.5 .B35 2011
5. 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
6. Wan Fauziah et al., (2011) Keusahawanan. Modul pengajaran. Penerbit UTHM. Call Number XX(160405.1)
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8. Kiyosaki, Robert T (1999). Cashflow quadrant : rich dad's guide to financial freedom. Warner Books, New york. Call Number: HG179 .K59 1999.
9. Siri Bijak Mengurus Wang (2012). Meneroka perniagaan kecil-kecilan. Time Edition, Selangor. Call Number: HG4529.5 SBI
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12. Solomon, George, (2008). Series: Journal of Small Business and Enterprise Development, v. 15, no. 2, Bradford, England. ISSN 1462-6004. eBook.

BFC 23702 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 decision 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, technique in creativity and technique in innovation.

References

1. Bernacki, E. 2002. Wow! That's a Great Idea!. Singapore : Prentice Hill.
2. Ceserani, J. & Greatwood, P. 2001. Innovation and Creativity. New Delhi : Creast Publishing House.
3. Clegg, B. & Birch, P. 2002. Crash Course in Creativity. London : Kpgan Page.
4. Creswell,J.W (2014). Research Design- Qualitative, Quantitative and Mixed Methods Approaches. Sage Publication, California
5. http://www.wisc.edu/writing/Handbook, University of Wisconsin-Madison Writing Centre

BFC 35303 Water System Design and Management
(Pre-requisite: BFC 10403 Fluid Mechanics, BFC 21103 Hydraulics, BFC 32002 Hydrology

Synopsis

The course consists of water supply and sewerage systems design based on population demand; urban stormwater management which includes hydraulic structures and pond design; and erosion and sediment control design. These designs should comply with authority requirements and standards.

References

1. SPAN (2018). Uniform Technical Guidelines Water Reticulation and Plumbing. Selangor: Suruhanjaya Perkhidmatan Air Negara (SPAN). Online at: https://www.span.gov.my/document/upload/1boqOn0UyhLeIpzAj8IuSne5gYCU7awQ.pdf
2. Brandt, M. J., Michael Johnson, K., Elphinston, A. J. & Ratnayaka, D. D. (2017). Twort's Water Supply, 7th edn. Heinemann: Elsevier. e-book at https://www.sciencedirect.com/book/9780081000250/tworts-water-supply
3. DID (2012). Urban Stormwater Management Manual for Malaysia, 2nd edn. Kuala Lumpur: Department of Irrigation and Drainage (DID), Government of Malaysia. Available at: https://www.water.gov.my/jps/resources/PDF/MSMA2ndEdition_august_2012.pdf
4. SPAN (2009). Malaysian Sewerage Industry Guidelines, 3rd edn. Selangor: National Water Services Commission (SPAN). Online at: https://www.span.gov.my/document/upload/Rtbh9zHKMuYxK0v7kqMNPPmI8EMIcS1y.pdf
5. MWA (2005). MWA Design Guidelines for Water Supply Systems. Kuala Lumpur: The Malaysian Water Association (MWA). Call no.: TD195.W3 .M34 2005.

BFC 35503 Contract and Estimation

Synopsis

Understanding the construction and contract laws and contract administration procedures in building construction is essential to ensure the success of project. This course introduces students to the construction law, contract law and common contract administration procedures in building and civil engineering projects. This course will also equip the students with knowledge in preparing cost estimation for projects. Scopes of study includes introduction to construction industry and contract management; basic construction and contracts laws including elements and discharge of contract and remedies for breach of contract; construction contract procedures; classification of construction contracts; cost estimation and quantity measurement; and build-up rate calculation.

References

1. Ahamad, A. and Khairuddin, A. R. (2003). Pengukuran kuantiti bangunan (beserta contoh kerja berdasarkan SMM2)/Measurement of building works with worked examples based on SMM2. Petaling Jaya, Selangor: Prentice Hall. [TH435 .A32 2003]
2. Ahamad, A. (2005). Anggaran kos kerja bangunan: berdasarkan SMM2. Petaling Jaya, Selangor: Pearson/Prentice Hall. [TA682.26 .A32 2005]
3. Ahmad, S. A. A. (1996). Principles of the law of contract in Malaysia. Kuala Lumpur, Malaysia: Malayan Law Journal Sdn. Bhd.[KPG810 .S93 2003]
4. Cawangan Kontrak & Ukur Bahan, Ibu Pejabat JKR Malaysia. (2010). Buku panduan pentadbiran kontrak kerja raya, edisi ketiga. Kuala Lumpur: Ibu Pejabat JKR Malaysia.

5. Harban Singh, K.S. (2004). Engineering and Construction Contracts Management. Singapore: Lexis Nexis. [KPG861.B84 .H37 2004].
6. Rajoo, S. and Harban Singh, K.S. (2012). Construction Law in Malaysia. Petaling Jaya, Selangor: Thomson Reuters. [KPG2590 .R34 2012].
7. The Institution of Surveyors, Malaysia. (2000). Malaysian Standard Method of Measurement of Building Works, Second Edition. Petaling Jaya, Selangor: The Institution of Surveyors, Malaysia.

BFC 43201 Civil Engineering Software Application

Synopsis

The civil engineering software such Esteem, Staad-Pro, HEC-RAS, WASDA and Microsoft Project are essential in civil engineering project. The ability in increasing the performance of project scheduling makes this technology important to understand by civil engineer. This course introduces students to applications of civil engineering software starts from the beginning in planning the project schedule until to produce the final result of designing civil project. Scope of the study includes the techniques and variables required in using the reinforced concrete design software: Esteem, analysis and structure design software: Staad Pro, project management software: Microsoft Project, river analysis system application: HEC-RAS and waste water treatment plant design: WASDA.

References

1. Esteem Structural Analysis, Design & Detailing Softwares User Manual; Esteem Innovation Sdn. Bhd.; 2001.
2. HEC-RAS Software User Guide; Hydrologic Engineering Center; USA; 2006.
3. Microsoft Project 2010 Bible; Elaine Marmel, Wiley Publishing Inc., Indiana, 2010.

BFC 43502 Occupational Safety and Health

Synopsis

This course introduces students to the study of workplace occupational safety and health. The student will learn about legislations related to OSH, OSH management at the workplace and safety culture. The scopes of the study also include risk assessment and management, as well as safety and health hazards involved at the workplace and their control measures. The student will also learn about the incident investigation technique and incident prevention.

References

1. Occupational Safety and Health Act (OSHA 1994) and Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.M34 2001 rw N2.
2. Factories and Machinery Act (FMA 1967) & Regulations. MDC Publishers Printer Sdn. Bhd. 2001. Call number: KPG1390.A31967 .A4 2001 rw N1.
3. Goetsch, David L. (2013). Construction Safety and Health. 2nd Edition. Boston: Pearson. Call number:TH443 .G63 2013
4. Kelloway, E. Kevin. (2014). Management of Occupational Health and Safety.
5. Ferret, E. (2012). Health and Safety in Construction Revision Guide. Abingdon, Oxon: Routledge. [HD7262.5 .F47 2012].

BFC 44903 Structural Steel Design
(Pre-requisite: BFC21403 Structural Analysis)

Synopsis

The application of steel structures in Civil engineering is widely used especially for the purposes of rapid construction, higher strength to weight ratio, ease modification, aesthetic value, etc. This course introduces students to simplified elastic design and plastic design of steelwork elements to BS EN 1993. Scope of study includes introduction to steelwork designs, the design concepts and processes by incorporating an acceptable margin of safety, serviceable and economic.

References

1. BS EN 1993-1-1 Design of steel structures – General Rules and rules for buildings, British Standard Institution.
2. BS EN 1993-1-8 Design of steel structures – Design of Joints, British Standard Institution.
3. Steel Building Design: Design Data in accordance with Eurocodes and the UK National Annexes (2015) The Steel Construction Institute, E-Book https://www.steelconstruction.info/File:SCI_P363.pdf
4. Chanakya Arya. (2009). Design of Structural Elements; Concrete, Steelwork, Masonry and Timber Designs to British Standard and Eurocodes, 2nd Ed., Taylor and Francis Group.

5. Leroy Gardner and David A. Nethercot (2011). Designers Guide to Eurocode 3: Design of Steel Buildings, 2nd edition (Designers' Guides to the Eurocodes). ICE Publishing.
6. "Gardner, Leroy Nethercot, David A.. (2011). Designers' Guide to Eurocode 3 - Design of Steel Buildings EN 1993-1-1, -1-3 and -1-8 (2nd Edition). ICE Publishing. E-Book https://app.knovel.com/hotlink/toc/id:kpDGEDSBEM/designers-guide-eurocode/designers-guide-eurocode"
7. Mohd Hanim Osman, Abdul Karim Mirasa and Ahmad Baharuddin Abd. Rahman (2008). Structural Steel Design to BS 5950: Part 1: 2000, Universiti Teknologi Malaysia.
8. William M. C. McKenzie (2004). Design of Structural Elements, Palgrave Macmillan.

Synopsis of Programme Courses – Year 3 Semester III

BFC 32904 Industrial Training
(Pre-requisite: Completed 82 Credit Hours)

Synopsis

Students are required to do the industrial training for the period of 10 weeks in the field of civil engineering in the approved organizations by the university. Every student will be evaluated by the faculty and industrial supervisor. In this program students are expected to be trained in systematic and structured way in the disciplines of civil engineering such as designing, constructing, human resources planning, engineering management, cost preparation, entrepreneurship, consultancy and research. Students are also trained in the aspects of work safety and health as well as ethics in the industry. Students shall be given the opportunity to involve directly in the aspects of management, planning, budget preparation, important documents preparation, supervising or maintenance of a project which depend on their availability in industry. Students shall involve in the work place with certain constraints that benefited them in improving their mental and physical fitness.

Synopsis of Programme Courses – Year 4 Semester I

UHB 40102 English for Occupational Purposes

Synopsis

This course employs a task-based learning approach and focuses on developing students' delivery of speech in oral interactions, job interviews and presentations. Particular emphasis will be given to promote the mastery of self-directed learning, team-work, research, oral presentations, reasoning and creativity. This course also enables students to acquire the knowledge and skills necessary for conducting and participating in meetings, which includes writing meeting documents and event proposals based on specific themes. Students will also be exposed to interview techniques.

References

1. Haynes, Marion E. (2009). Meeting skills for Leaders: Make Meetings more Productive (4th ed.). Rochester, NY: Axzo Press. HD30.3 .H39 2009
2. Leigh, Judith, (2004). Cv's and Job Application. New York: Oxford university Press. HF5383 .L44 2004.
3. Molinsky, Steven J, & bliss, Bill. (1994). Day by Day. English for Employment Communication (1st ed.): Longman. PE1128 . M67 1994
4. Peberdy, Duncan. (2009). Brilliant Meetings: What to Know, Do and Say to Have Fewer, Better Meetings. Harlow: Prentice Hill. HF5734.5 .P42 2009
5. Wendleton, Kate. (2014). Mastering the Job Interview and Winning the Game (5th ed.). Boston: Cengage Learning. HF5549.5.16 . W46 2014.
6. Wrathall, Jeff, (2011). Event Management: Theory and Practice. North Ryde, N.S.W: McGraw-hill, GT3405, W72 2011

BFC 43402 Final Year Project 1

(Pre-requiaite: Completed 96 Credit Hours)

Synopsis

Final Year Project (FYP) is a form of training and exposure to engineering research undertaken by students independently and systematically under the guidance of a supervisor selected among academicians. The project focuses on a particular field of knowledge, the use of principles and related concepts and the application of techniques dealing with complex yet relevant engineering problems. Students are required to carry out the project individually. The project consists of 2 phases, i.e. FYP 1 and FYP 2, which are conducted consecutively in the final year of the program. Two credit hours are assigned to FYP 1 and four credit hours are assigned to FYP 2.

For this course, students are required to plan and organise the research project that will be executed in FYP 2 and determine the expected results. Students will have to identify the research aim and objectives, prepare the literature review, design the research methodology and draft a proposed work plan. At the end of this course, each student is required to submit a project proposal report. The report should comply with the prescribed format. The student is also required to present his/her project proposal in front of an examination panel.

References

1. Guidelines For The Implementation Of Final Year Project, Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, 2013.
2. Ranjit Kumar, Research methodology: a step-by-step guide for beginners, Sage Publication, 2005
3. Donald H McBurney and Theresa L. White, Research Methods, Thomson Learning, 2007
4. Geraldine Wood, Research paper for dummies, Hungry Mind, 2002
5. John Creedy, Research without tears: from the first ideas to published output, Edward Elgar Publication, 2008.
6. Richard Fellow and Anita Lui, Research method for construction, Wiley Blackwell, 2008.

BFC 43303 Integrated Design Project
(Pre-requisite: BFC 34803 Reinforced Concrete Design, BFC 21103 Hydraulics, BFC 32403 Environmental Engineering, BFC 20703 Engineering Geomatic, BFC 32904 Industrial Training; and BFC 43201 Civil Engineering Software)

Synopsis

Civil engineering graduates are expected to work in the design of various projects which require technical competency and skills of managerial, organisational, communicative and team working. The projects usually are multidisciplinary such as encompassing such as surveying, geotechnics, hydraulics, structure and environmental engineering. This course is design to develop those skills and competency through a group project involving a number of major fields of civil engineering.

BFC 43103 Foundation Engineering
(Pre-requisite: BFC 34402 Geotechnic II)

Synopsis

Foundation is an important element of sub-structure that transfers loads from superstructure to the ground or subsoil. A proper design of foundations will ensure the stability of the superstructure such as buildings and geotechnical structures such as retaining walls and excavations. This course introduces students to the procedures and methods of data collection for foundation design purposes, types and design of foundations as well as improvement methods to the weak soils. Scopes of study includes theory of bearing capacity and design of shallow and deep foundation, types and design of retaining structures, soil investigation procedures and soil improvement.

References

1. Braja M Das. (2017) Principles of Foundation Engineering(Ninth Edition); Brooks/Cole Publishing Co.(Library shelf number: TA 775.D37 2011)
2. JJoseph E. Bowles. (1996) Foundation Analysis and Design; The McGraw Hill Co. (Library shelf number: TA 775.B68 1996)
3. Muni Budhu. (2007) Soil Mechanics and Foundations. Hoobeken, NJ., John Wiley. (Library shelf number: TA 710.B83 2007)
4. Muni Budhu. (2008)Foundations and Earth Retaining Structure. Hoobeken, NJ., John Wiley. (Library shelf number: TA 710.B82 2008)

BFC 44602 Engineering Economic

Synopsis

Engineering economy consists of: Introduction to Engineering Economics, fundamental cost concepts, cost estimation techniques, time value of money, project evaluation with the benefit-cost ratio method, risk analysis and project financing and allocations.

References

1. Blank, L.T., A. Tarquin (2008): Basics of Engineering Economy, International ed., McGraw-Hill, New York, Call Number TA 177.4 B524 2008
2. Mohamad Sirin, R. (2007): Teori Asas Ekonomi Kejuruteraan, Faculty of Technolyog Management KUiTTHO. Malaysia. Call Number: TA177.4 R67 2007
3. Blank, L.T., A. Tarquin (2012): Engineering Economy, Seventh Edition, International ed., McGraw-Hill,New York
4. Sullivan W.G, Wicks E.M. and Koelling C.P, (2012). Engineering Economy, 15th Edition, Upper Saddle River, New Jersey, Pearson. Call Number: TA 177.4 S94 2009
5. Park, C. S. (2007). Contemporary Engineering Economics, 4th Edition,Upper Saddle River: New Jersey, Prentice Hall Call Number: TA177.4 P372 2007
6. John A.W, Kenneth E.C, David B.Pratt (2010), Principles of engineering economic analysis, 5th edition, Hoboken, NJ : John Wiley. Call Number: TA177.4 .W44 2010
7. Ardalan, Abol (2000),Economic and Financial Analysis for Engineering and Project Management,Lancaster, Penn : CRC Press. 2000. eBook.
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Synopsis of Programme Courses – Year 4 Semester II

BFC 43604 Final Year Project 2
(Pre-requiaite: BFC 43402 Final Year Project 1)

Synopsis

Final Year Project (FYP) is a form of training and exposure to engineering research undertaken by students independently and systematically under the guidance of a supervisor selected among academicians. The project focuses on a particular field of knowledge, the use of principles and related concepts and the application of techniques dealing with complex yet relevant engineering problems. Students are required to carry out the project individually. The project consists of 2 phases, i.e. FYP 1 and FYP 2, which are conducted consecutively in the final year of the program. Two credit hours are assigned to FYP 1 and four credit hours are assigned to FYP 2.

For this course, students are required to execute the project that was proposed in the previous semester (FYP 1). All the data collected will have to be analysed using appropriate methods, and the research findings, conclusions and recommendations will have to be communicated. At the end of course, each student is required to submit a technical paper and a final report. The paper and report must comply with the prescribed formats. The student is also required to present his/her project in front of an examination panel.

References

1. Guidelines For The Implementation Of Final Year Project, Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, 2013.
2. Ranjit Kumar, Research methodology: a step-by-step guide for beginners, Sage Publication, 2005
3. Donald H McBurney and Theresa L. White, Research Methods, Thomson Learning, 2007
4. Geraldine Wood, Research paper for dummies, Hungry Mind, 2002
5. John Creedy, Research without tears: from the first ideas to published output, Edward Elgar Publication, 2008.
6. Richard Fellow and Anita Lui, Research method for construction, Wiley Blackwell, 2008

BFA 40103 Environmental Management
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

This course covers introduction to environmental management, environmental management issues, waste minimization, environmental management system, environmental audits, transportation development and problems, environmental assessment and the management of the various ecosystems in the built and natural environments.

References

1. Belcham, Adrian (2015) Manual of environmental management London : Routledge. GE300 .B44 2015.
2. Brady, John (2011) Environmental management in organizations : the IEMA handbook Washington, DC : Earthscan. GE300 .E58 2011
3. Theodore, Mary K. (2010) Introduction to environmental management. Abingdon : Taylor & Francis. GE300 .I58 2010.
4. Goetsch, Davis L (2001). ISO 14000 environmental management Upper Saddle River, NJ: Prentice Hall. TS155.7 .G63 2001.

BFA 40203 Design of Water supply
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

This course introduces students to establish the knowledge and understanding in public water supply, starts with the treated water standard, low flow estimation of a river and the typical surface water treatment (including aeration, coagulation, flocculation, sedimentation and softening). Design works include water demand, intake work, distribution network, pumping requirement, and hydraulic analysis. Water distribution, pumping, storage tank and reticulation systems are designed according to MWA Design Guidelines for Water Supply Systems.

References

1. Viessman Jr. W and Hammer, M. J.; Water Supply and Pollution Control; Prentice Hall, 2005. TD353.V542009.
2. The Malaysian Water Association; MWA Design Guidelines for Water Supply Systems; Kuala Lumpur the Malaysia Water Association; 2005. TD195.W3.M34 2005.
3. Hammer, M.J.; Water and Wastewater Technology; 5th Edition; Pearson Education, 2004. TD345.H35 2004.
4. Qasim S.R., Motley E.M.and Guang Zhu; Waterworks Engineering – Planning, Design and Operation; Prentice Hall; 2000.
5. Peavy, H.S., et al.; Environmental Engineering; McGraw Hill; 1990. TD145.P43 1985.
6. Crittenden, J.; Water Treatment: Principles and Design. John Wiley, 2005. TD 430. W37 2005.
7. Hendricks D.; Water treatment unit processes: physical and chemical. Taylor & Francis, 2006. TD430. H464 2011.

BFA 40303 Solid and Hazardous Waste Management
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

This course introduces students to establish the knowledge and understanding on the municipal solid and hazardous waste. Scope of study includes sources, characteristics, generation, storage and collection. The integrated solid waste management discusses the waste collection, transfer and transport, waste as resource, and disposal of solid waste in the sanitary landfill. The operation and management of sanitary landfill covers the management of leachate, gas, and landfill cover. Hazardous waste covers the laws, regulations, treatment technologies, and disposal methods. The methods from groundwater remediation is included.

References

1. Mackenzie L. Davis and David A. Cornwell (2013). Introduction to Environmental Engineering, 5th Edition Singapore: McGraw Hill. TD 145.D384 2013.
2. Gilbert M. Masters and Wendel P.Ela (2008). Introduction to Environmental Engineering and Sciences, New Jersey: Pearson Prentice Hall. TD145.M37 2008.
3. Mackenzie L. Davis and Susan J. Masten (2004). Principles of Environmental Engineering and Sciences, New York: McGraw Hill. TD 145.D38 2008
4. David H. F Liu and Béla G. Liptak (2000). Hazardous Waste and Solid Waste. USA: Lewis Publishers. TD1030.H39 2000.
5. William C. Blackman. Jr (2001). Basic Hazardous Waste Management 3rd Edition. USA: Lewis Publishers. TD 1040.B39 2001
6. Philips B. Bedient, Hanadi S.Rifai and Charles J. Newell (1999). Groundwater Contamination Transport and Remediation, 2nd Edition. New Jersey: Prentice Hall. TD 426.B42 1999.
7. Gaye Woodside (1999). Hazardous Materials And hazardous Waste Management, 2nd Edition. USA: Wiley. TD 1030.W66 1999.
8. Calvin R. Bunner (1993). Hazardous Waste Incineration, 2nd Edition. USA: Mc-GrawHill. TD 1062.B78 1993.

BFA 40403 Design of Waste Water Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Design of wastewater engineering involved in analyzing and process of design systems and technology wastewater treatment through sustainable approaches. This course introduces students to establish the knowledge and understanding in planning, design and operation of wastewater treatment. Scope of study includes of wastewater characteristics, fundamentals design of physical operations and primary treatment unit. Secondary treatments are covered on biological processes including suspended and attached growth for aerobic and anaerobic process. Design of wastewater treatment systems include activated sludge processes, biofilm processes, anaerobic digestion processes, advanced wastewater treatment system, disinfection, and sludge disposal and reuse.

References

1. Karia G.L. and Christian, R.A. Wastewater treatment: concepts and design approach. Prentice-Hall. 2006. TD745 .K37 2006.
2. Metcalf and Eddy. Wastewater Engineering: Treatment and Reuse; revised by George Tchobanoglous, Franklin L. Burton and H. David Stensel; McGraw Hill 4th Edition 2003. TD645 .W38 2003.

3. Hammer, M.J. Water and Wastewater Technology; 5th Edition; Pearson Education, 2004. TD345 .H35 2004.
4. Davies, M.L and Masten, S. J. Principles of Environmental Engineering and Science; McGraw Hill; 2009 TD145 .D38 2009
5. Edward Rubin. Introduction to Engineering & the Environment. Mc Graw Hill; 2001. TA170 .R83 2001 N4.

BFB 40203 Tall Building Construction
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Tall building construction is regarded as an essential contributor to the process of economic growth of a country, especially in congested area. Therefore, this course introduces students to the knowledge and understanding in site planning, coordination of construction method and sequence from foundation to roof, and safety and health issues in constructing tall building.

References

1. Chew Yit Lin, Micheal (2012). Construction Technology for Tall Building, 4th Edition, World Scientific. (TH845 C43 2012)
2. Chudley R (2010). Building Construction Handbook, 8th Edition; Amsterdam: Butterworth-Heinemann.(TH151 .C48 2010 2001/2004/2010)
3. S.W.Nunnally (2011). Construction Methods and Management, 8th Edition; Upper Saddle River, New Jersey : Prentice Hall, 2011. (TH145 N86 2001/2004/2007/2011)
4. Sarkisian, M. (2016). Designing tall buildings: structure as architecture. Routledge. NA6230.S27
5. Peurifoy, Robert L. (2011). Construction Methods and Planning, 8th Edition, New York : McGraw-Hill, 2011. (TH145 P48 2011)
6. Microys, Helmut F.(1992) Cast-in-place construction in tall building design and construction, New York : McGraw-Hill, 1992. (TA683.4 .C37 1992)

BFB 41003 Building Services
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

The construction industry has been increase drastically with the new design concepts and new building typologies to provide human comfort and satisfaction in the way they live and work. This course assists students to justify the services and environmental factors for indoor comfort and satisfaction. Scope of study includes heat transfer, air conditioning system, psychrometric chart, user circuits, building electrical system, lift and escalator.

References

1. S. Don Swenson. 2004. HVAC: Heating, Ventilating and Air-Conditioning; 3rd Edition. American Technical Publishers. Call Number: TH7012. S93 2004
2. William K.Y. Tao. 2005. Mechanical and Electrical Systems in Buildings, 2nd Edition. Prentice Hall. New Jersey. Call Number: TH6010. T36 2005
3. David V. Chadderton. 2007. Building Services Engineering, 3rd Edition. E & FN SPON. London. Call Number: TH6010. C42 2007
4. F.Hall. 2009. Building Services Handbook, Incorporating Current Building & Construction Regulations, 5th Edition. Butterworth Heinemann. Call Number: TH151. H34 2009
5. Benjamin Stein. 2000. Mechanical and Electrical Equipment for Buildings, 9th Edition. John Wiley & Sons. Inc. New York. Call Number: TH6010. S74 2000 N1.

BFB 41103 Acoustic and Lighting
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Acoustical engineers apply science and fundamental concepts, along with complex mathematical analysis, to control sound for a variety of applications. The primary goal of acoustical engineering is the reduction of unwanted sounds, which is referred to as noise control. Sound can have significant impacts on human health and well being, and is therefore important to control. Noise control principles are implemented into technology and design in a variety of ways. This course assists students to justify the aural and visual for indoor comfort and satisfaction. Scope of study includes sound, acoustic concepts, loudness and vibration control, lighting principles, day lighting and artificial lighting.

References

1. Randall F. Barron. 2003. Industrial Noise Control and Acoustics; Marcel Dekker. Inc; New York. Call Number : TD892. B37 2003.
2. David V. Chadderton. 2007. Building Services Engineering, 5th Edition; Taylor & Francis; London. Call Number : TH6010. C42 2007
3. Benjamin Stein. 2000. Mechanical And Electrical Equipment for Buildings, 9th Edition; John Wiley & Sons. Inc; New York. Call Number : TH6010. S74 2000 N1.
4. Derek Phillips. 2000. Lighting Modern Buildings; Architectural Press; Auckland. Call Number : TH7703. P54 2000 N1
5. Eberhard Hansler. 2004. Acoustic Echo and Noise Control: A Practical Approach; John Wiley. Call Number : TK5102.98. H36 2004

BFB 40903 Building Maintenance
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

This course introduces students to basic principles in building maintenance. The aim is to generate knowledge and understanding of basic principles, design process and management system in building maintenance. Scope of study include introduction to building maintenance, information management, maintenance organization, building life cycle cost, equipments and building defects, maintenance planning and contract.

References

1. Barrie Chanter; Building Maintenance Management, 2nd Edition; Blackwell; 2006.
2. Richard D. Palmer; Maintenance Planning And Scheduling Handbook, 2nd Edition; McGraw-Hill; 2006.
3. Lindley R. Hinggins; Maintenance Engineering Handbook, 6th Edition; McGraw-Hill; 2002.
4. Daryl Mather; The Maintenance Scorecard; Creating Strategic Advantage; Industrial Press; 2005.
5. Eberhard Hansler. 2004. Acoustic Echo and Noise Control: A Practical Approach; John Wiley.

BFG 40103 Advanced Foundation Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Foundations, the structural element transfers not only static loads but also dynamic and seismic loads from superstructures to the ground. The design and analysis of bearing capacity and stability of foundations and other geotechnical structures can be perform using numerical analysis concepts as advanced analytical tools. This course introduces students to numerical analysis concepts in designing foundations and various geotechnical structures subjected to static and dynamic loadings. Scopes of study includes numerical methods in geotechnical engineering and their application in designing foundations and retaining structures, design of foundations and geotechnical structures subjected to dynamic loadings.

References

1. C.S. Desai, Numerical Method in Geotechnical Engineering, McGraw Hill, 1987. (TA703.5.157 2001)
2. David M. Potts, Finite Element analysis in Geotechnical Engineering, Thomas Telford, 1999. (TA347.F5.P67 1999)
3. Joseph E. Bowles, Foundation Analysis and Design, McGraw-Hill, 1996. (TA775.B68 1996)
4. Manfred R. Hausmann, Engineering Principles of Ground Modification, McGraw-Hill,1990. (TA710.H34 1990)
5. Shamser Prakash, Pile Foundation in Engineering Practice, John Wiley and Son,1990. (TA780.P72 1990)

BFG 40203 Advanced Geotechnic
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Advanced geotechnical is advanced conceptual, physical and numerical models in predicting the response of soil to changes in load and analyzing unsaturated soil. This course introduces the student to the latest techniques in certain major areas of geotechnical engineering. In this course students are exposed to advanced knowledge as well as statistical and numerical techniques and the modeling of stress and strain in soil. The scopes of the course are introduction to characteristics of soils, theories of unsaturated soils, critical state soil mechanics, soil modeling theory, simulation and modeling with analytical computer software.

References

1. Atkinson, J. H. (1993)' "An Introduction to the Mechanics of Soils and Foundations Through Critical State Soil Mechanics", McGraw-Hill Book Company. (TA710 .A843 1993)
2. David, M.W. (1990), "Soil Behaviour and Critical State Soil Mechanics", Cambridge University Press, UK. (TA710 .W66 1990 N1)
3. David, M.W. (2004), "Geotechnical Modelling", Spon Press, New York, USA. (TA710 .W66 2004)
4. Fredlund, D.G. and Rahardjo, H. (1993), "Soil Mechanics for Unsaturated Soils", John Wiley & Sons, Inc., USA. (TA710.5 .F73 1993)
5. Lu, N. and Likos, W.J. (2004), "Unsaturated Soil Mechanics", John Wiley and Sons, Inc., USA. (TA710 .N56 2004).

BFG 40303 Geo-Environment
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Generally domestic and industrial wastes in the form of solid and liquid are disposed within soil layers. The hazardous and non-hazardous wastes will eventually act as contaminants to porous materials like soils and underground water and change their characteristics. These uncontrolled waste disposals will certainly provide negative implications for human beings, structures and environment. This course provides knowledge and detailed understanding on the implications soil and groundwater contaminations and exposure to various techniques to solve problems based on approaches by industry. Scopes of study include factors of underground contaminations, physical-chemical interaction, and transportation of underground contaminants, characteristics of contaminated soils and water, sub-soil investigation and mitigation methods.

References

1. Yong,R.N.; Geoenvironmental Sustainability,CRC Press,2007 (TD 171.9 .Y66 2007)
2. Sharma,H.D. & Krishna, R.R.;Geoenvironmental Engineering: Site Remediation, Waste containment, and Emerging Waste Management Technologies, Univ Illinous Chicago,2004 (TD 171.9 .S52 2004)
3. Rowe, R.K.; Geotechnical and Geoenvironmental Engineering Handbook, 2001 (TA 705 .G46 2001 r N1)
4. Yong, R.N. and Thomas, H.R.; Environmental Engineering: Geoenvironmental Impact Management, 3rd Ed, Cardiff Univ. Edinburgh,2001 (TA 705 .G96 2001 N1)
5. Yong R.N., Geoenvironmental Engineering : Contaminated Soils, Pollutant Fate, and Mitigation, CRC Press, 2001. (TD 878 .Y66 2001 N1)
6. Reddi,L.N. and Inyang, H.I.;Geoenvironmental Engineering: Principles and Application, Marcell Dekker Inc, 2000 (TD 878 .R42 2000 N1)
7. Cairney T. and Hobson D.M.;Contaminated Land: Problems and Solutions, 2nd Ed,E & FN Spon,1998 (TD 878 .C66 1998)
8. Oweis I.S. and Khera R.P.;Geotechnology of Waste Management, 2nd Ed.,PWS Publishing, 1998 (TD 795.7 .O83 1998 N3)

BFG 40403 Geosynthetics Design
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Geo-synthetics is the term used to describe a range of synthethic products used to aid in solving some geotechnical problems. Geo-synthetics are available in a wide range of forms and materials, each to suit different end uses. These products have a wide range of applications and are currently used in many civil and geotechnical engineering. This course introduces to student different types and applications of geo-synthetic. The scope of this course is introduction to geo-synthetic, usage and design of geo-synthetic as filter and erosion controller, usage and design of geo-synthetic in drainage system, usage and design of geo-synthetic as separator material, usage and design of geo-synthetic as soil reinforcement material and the application of software.

References

1. Rowe, R. K. (Ed.), (2001), "Geotechnical and Geoenvironmental Engineering Handbook", Kluwer Academic Publishers, Boston, USA. (TA705 .G46 2001 r N1)
2. Dixon, N., Smith, D. M., Greenwood, J. R. and Jones, D. R. V. (2003), "Geosynthetics: Protecting the Environment", Thomas Telford Publ., London, England.(TA455.G46 2003)
3. Koerner, R. M. (2005), "Designing With Geosynthetics", 5th Edition, Pearson Prentice Hall Publ., Upper Saddle River, New Jersey, USA.(TA455 .G44 .K63 2005)

4. Shukla, S. K. and Yin, J.-H. (2006), “Fundamentals of Geosynthetic Engineering”, Taylor and Francis Publishers, London, England. (TA455 .G44 S58 2006)
5. Sarsby, R. W. Ed. (2007), ”Geosynthetics in Civil Engineering”, Woodhead Publishing Ltd., Cambridge, England. (TD171.9 .G47 2006)

BFG 40503 Engineering Geophysics
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Engineering geophysics is a course for introducing the geophyical techniques in investigating the problem related to civil engineering works, and geo-environmental such as characterise the ground profiling, groundwater pollution and utility detection. This course introduces the student to the geophysics as an investigative tool such as seismic refraction, multi-channel analysis of surface wave, electrical resistivity and ground penetrating radar (GPR). The scopes of the course are introduction to the theories of seismic wave propagation, electrical current flow and electromegnatic wave in relation with the geophysical techniques. Geophysical knowledge in the underground mapping able to challenge the issues of cost of project and environmental management.

References

1. Santamarina, J.C. (2001)’ “Soils and waves: particulate material behavior, characterization and process monitoring”, McGraw-Hill Book Company. (S591.S26 2001)
2. Lai, Carlo G.(2005), “Surface waves in geomechanics: direct and inverse modelling for soils and rocks”, New York: Springer. (TA706.L34 2005)
3. Zhdanov, Mikhail S.(2009), “Geophysical electromagnetic theory and methods”, Elsevier. (TN269.Z42 2009)
4. Foti S. (2015), “Surface wave methods for near-surface site characterization”, Boca Raton. (QE538.5 S97 2015)

BFG 40603 Soft Soil Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Generally, building structures and other geotechnical structures built on or within good and hard soils will be safe in terms of bearing capacity and settlement. The design of foundations is a straight forward process for structures in such a soil. When dealing with soft soil advance or in-depth understanding on the behavior of such a soil is required so that practicable and appropriate improvement techniques can be planned applied and the design of foundation on it can be properly carried out. This course provides students with in-depth knowledge in analyzing and designing geotechnical structures in soft soil area including appropriate techniques to improve their engineering properties. Scopes of study include geology of soft soil area, soft soil investigation, soft soil behavior in term of stress-strain and settlement characteristics, design of foundations and embankment on soft soil and improved techniques and procedures.

References

1. Lee, C.F., Soft Soil Enginnering, A.A. Balkema, 2001 (TA710.A1.I76 2001)
2. Brand, E W., Soft Clay Engineering, Elsevier Scientific Publishing Co.1991
3. Leroueil,S.,Embankments on Soft Clays, Ellis Horwood,1990 (TA760 .L47 1990)
4. CUR, Building on Soft Soil, A.A Balkema, 1996 (TA 710 .B84 1996)
5. Bo, M.,W., Soil improvement : Prefabricated Vertical Drain Techniques, Thomson Learning, 2003 (TA710 .S64 2003)

BFG 40703 Applied Geomatics
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Geomatics can be defined as part of scientific knowledge, including the sciences, techniques and methods that deal with the measurement, mathematical modeling, geo-referencing, mapping and staking of spatial geometric elements of the Earth´s surface. Due to the multitude of applications, it is therefore a vital area of expertise in civil engineering, which must be understood and assimilated by civil engineers. Like all technical segments; Geomatics is also undergoing important technological advances over the years, incorporating new instruments, new technologies and new working methods. This is the case, for instance, of 3D data collection, geodetic structural monitoring and construction, to name a few. In order to correctly apply these new tools, it is important that civil engineers know the most important details of each instrument, its technical resources and the level of accuracy that can be achieved with its use. In that sense, the proposed syllabus aims to discuss the new technologies available in Geomatics and their

applications in civil engineering projects and jobsites workflow. It will focus on the main technical features of topographic and geodetic instruments and its application, including Remote Sensing technology, Geographical Information System (GIS), UAVs and Geodetic Structural Monitoring, among others

References

1. Kavanagh, B.F. and Glenn Bird S.J. (2009), Surveying: Principles & Applications, 6th Edition; Prentice Hall, USA [TA545.K37 2009]
2. Kavanagh, B.F. (2010), Surveying with construction application; Prentice Hall, USA. [TA625.K38 2010]
3. Paul R. Wolf and Charles D. G. (2002), Elementary Surveying-An Introduction to Geomatics; 10th Edition; Prentice Hall, [TA545.W64 2002]
4. Stephen V. E. (2009) A guide to understanding land surveys, Hoboken, NJ: J. Wiley, [TA551.E87 2009]
5. Watson, P. (2008) Surveying and Engineering : Principles and Practice;Francis 10th Edition, Addison Wesley,[TH438.S97 2008]
6. DeBashis, C. (2007). Fundamentals of geographic information system. Viva books, New Delhi. [G70.212.C44 2007]
7. Alfred L. (2015), GPS Satellite Surveying, John Wiley, Hoboken [TA595.5 .L44 2015]

BFG 40803 Geographical Informations Systems For Civil Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

This course provides an introduction to the basic concepts, features, and capabilities of GIS. The focus of this course is to learn the usefulness of GIS in solving problems in various civil and environmental engineering disciplines. Also to develop basic skills of using GIS software for problem solving. Students are trained to become familiar in usage of ESRI ArcGIS software through the project. The course will require the completion of a series of homework assignments, some of which will be part of a mini team project that solves a selected civil engineering or environmental engineering problem.

References

1. Alfred L. (2015), GPS Satellite Surveying, John Wiley, Hoboken [TA595.5 .L44 2015]
2. John S. & Graham C. (2004), Applied GIS and Spatial Analysis. John Wiley & Sons, Inc., New York. [G70.212.A66 2004]
3. DeBashis, C. (2007). Fundamentals of geographic information system. Viva books, New Delhi. [G70.212.C44 2007]
4. Longley, Paul A., (2005). Geographical information systems:Principles and applications. John Wiley & Sons, Inc., New York. [G70.212.G464 2005]

BFP 40103 Construction Planning And Scheduling
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

The application of construction planning and scheduling in Civil engineering is widely used to achieve an organized construction project, through a proper planning, monitor, and control methods through the whole construction stages. This course introduces students to Work Breakdown Structure, Planning and Scheduling Method, Controlling Method, Resource Leveling, Crashing Program, and Programme Evaluation And Review Technique (PERT). Scope of study includes the definition, objective, and basic principles of planning and scheduling, by incorporating scheduling techniques in general.

References

1. Clough, R.H & Sears, S.K; Construction Project Management (4th Ed.); New York: John Wiley, 2000. Call Number : TH438. C63 2000.
2. Clough, R.H & Sears, S.K; Construction Project Management: A Practical Guide To Field Construction Management (5th Ed.); New York: John Wiley, 2008. Call Number : TH438. S42 2008.
3. Gould, F.E & Joyce, E.N; Construction Project Management (3rd Ed.); Upper Saddle River: Prantice Hall, 2009. Call Number : TH438. G68 2009.
4. Oberlander, G.D; Project Management for Engineering and Construction (2nd Ed); Boston: Mc Graw Hill, 2000. Call Number : TA190. O23 2000.
5. Patrick, C.; Construction Project Planning and Scheduling; Upper Saddle River: Prantice Hall, 2004. Call Number : TH438.4. P37 2004.
6. Hinze, Jimmie W; Construction Planning and Scheduling, (3rd Ed.); Upper Saddle River. Pearson, 2008. Call Number : TH438.4. H56 2008.

7. Saleh Mubarak; Construction Project Scheduling and Control (2nd Ed.; New Jersey: John Wiley, 2010. Call Number :TH 438.4.M82 2010

BFP 40203 Construction Machinery And Equipment Management
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

To generate knowledge and understanding regarding the management of construction machinery and equipment such as excavator, trucks, compactor, levelling machineries, concreting plant and equipment, lifting machineries, premix plant and equipment, and multipurpose machineries. Managing construction machinery and equipment is important to engineers for construction planning and estimating to deliver efficient construction works..

References

1. Edward Allen; Fundamentals of Building Construction; Fourth Edition, John Wiley & Sons, 2004. Call Number: TH145. A44 2004
2. Nunnally S.W.; Managing Construction Equipment; 2nd Edition, Prentice-Hall, Inc., Englewood Cliffs, New Jersey; 2000. Call Number : TA213. N86 2000
3. Roy Chudley; Advanced Construction Technology; Fourth Edition, Prentice-Hall, Dorchester, Dorset; 2006. Call Number : TH145. C484 2006.
4. Robert L. Peurifoy, Construction Planning, Equipment and Methods; 8th Edition, McGraw-Hill Company; 2011. Call Number : TH145.P48 2011
5. Gransberg, Douglas D., Construction Equipment Management for Engineers, Estimators and Owners. Boca Raton, 2006. Call Number : TA213. G72 2006

BFP 40603 Industrialized Building System
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Prefabricated construction is known as an industrialized building system (IBS) in Malaysia. Building production in a controlled environment offers many advantages. This course is designed to provide exposure to students on the IBS concepts, advantages and disadvantages, roadmap of IBS and the application of IBS in the construction industry. It also highlighted IBS scoring system, principal of modular coordination, buildability, construction joints and tolerances in IBS implementation. The students are required to complete a project to enhance their knowledge on subject matter.

References

1. Elliott, Kim S.; Precast concrete structures; Oxford: Butterworth Heineman; 2002; Call Number :TA683.7 .E44 2002 N1
2. Richardson, J G.; Precast concrete production; London: Cement and Concrete Association; 1973; Call Number :TA444 .R53 1973
3. Levitt, M.; Precast concrete: materials, manufacture, properties and usage; New York: Taylor & Francis; 2008; Call Number : TA439 .L48 2008
4. Gibb, Alistair G. F.; Off-site fabrication: prefabrication, pre-assembly and modularization; Latheronwheel : Whittles; 1999; Call Number : TH1098 .G52 1999
5. Smith, Ryan E.; Prefab architecture : a guide for to modular design and construction ; Hoboken, N.J. : John Wiley & Sons; 2010; Call Number : NA8480 .S65 2010
6. Minguet, Josep Maria; Contemporary green prefab: industrialized & kit architecture; Singapore; Page One Pub.; 2012; Call Number : NA7145 .C66 2012
7. Staib, Gerald; Components and systems modular construction : design structure new technologies; Basel : Birkhauser, 2008; Call Number : TH1098 .S72 2008
8. Lembaga Pembangunan Industri Pembinaan Malaysia; CIS 18:2010 Manual for IBS Content Scoring System; Perpustakaan Begara Malaysia; Kuala Lumpur; 2010.
9. Ministry of Works, Malaysia; Roadmap for Industrialised Building System (IBS) in Malaysia 2011-2015; Construction Industry Development Board; Kuala Lumpur; 2010.

BFS 40103 Advanced Structure Analysis
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Advanced Structural Analysis covers the discussion of the various aspects of modern structural analysis, ranging from elementary continuum mechanics theory to advanced analysis using the matrix method. The text is geared towards practical engineering problems and attempts to cover essential analysis considerations and techniques present in the daily work of the experienced professional. Scope of the study includes analysis on indeterminate structure, introduction to finite element, elastic and inelastic stability of columns, yield line theory and plastic theory.

References

1. Johnson, D (2000), Advanced Strcutural Mechanics 2nd Edition, Thomas Telford, TA645 .J63 2000
2. Boresi, Arthur P.,(2003), Advanced Mechanics of Material, Sixth Edition, John Wiley & Sons, TA405 .B67 2003
3. Chen W. F and Han D. J (2007), Plasticity for Structural Engineers, Springer Verlag New York, TA418.14 .C33
4. Zienkiewicz O.C and Taylor R.C (1991), The Finite Element Method, Volume 1 and Volume 2, 4th Edition, McGraw-Hill, TA640.2 .Z54
5. Paz, M (1991), Structural Dynamics: Theory and Computations, Von Nostrand Reinhold New York

BFS 40303 Prestressed Concrete Design
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Concrete construction method has evolved throughout the history of mankind. Many methods were discovered accordingly to the purpose of a building and at the same time improving its' aesthetic value. Prestressed method is an idealization which allows a structure withstand a tremendous amount of force while maintaining its shape by using the advantages of steel reinforcement which has a high tensile properties applied in the concrete structure. This course introduces students to the method of prestressed concrete construction with the guidance of the code of practice. Scope of study includes the principle and prestressed method, advantages and disadvantages of prestressed structures, prestressed systems, stress limit and materials, prestressed losses- short and long term losses. Also, analysis and design of simply supported and continuous beam, basic inequality equations, sizing, Magnel diagram, design of tendon profile, ultimate limit state design, ultimate resistance moment, shear design, end-block design, short and long term deflection and composite construction are included in this course.

References

1. Antoine E. Naaman; Prestressed Concrete Analysis and Design: Fundamentals; Techno Press; 2nd edition; 2004. (TA683.9)
2. Benaim, Robert; The design of prestressed concrete bridges: concepts and principles; Taylor & Francis; 2008. (TG340. B46 2008)
3. Mosley, W. H.; Reinforced concrete design to Eurocode 2 (EC2); Macmillan press; 1996. (TA683 .M67 1996).
4. Shunran Takahashi; Basic design of prestressed concrete structures for engineers; Civil Engineering Department, Politeknik Shah Alam; 2000. (TA683. S58 2000)
5. R.I. Gilbert ; Design of Prestressed Concrete; E and FN Spon; 1997. (TA683.9. G54 1990)

BFS 40603 Concrete Technology
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Concrete is the most widely used composite material in the construction industry. This course exposes student to the advancement of concrete engineering and different concrete mix design methods. The scope of this course includes concrete durability, chemical attack and corrosion mechanisms. Besides that, lightweight concrete, blended cement concrete, special concrete, concrete mix design and concrete repair are covered.

References

1. Michael S. Mamlouk, John P. Zaniewski; Material for Civil and Construction Engineers, 2nd Edition; Prentice Hall, USA 2006. (TA403 .M36 2011)
2. C. L. Page & M. M. Page; Durability of concrete and cement composites; Woodhead Publishing Limited; 2007. (TA440. D87 2007)

3. Zhang, Haimie; Building Materials in Civil Engineering; Woodhead Publishing Limited, 2011. (TA 403. Z42 2011)
4. P. Kumar Mehta, Paulo J. M. Monteiro; Concrete: microstructure, properties, and materials; McGraw-Hill, 2006. (TA439 .M43 2006)
5. A. M. Neville, J. J. Brooks; Concrete Technology Edition 2; Pearson Education, Limited, 2010. (TA439. N46 2010)
6. ACI Design Handbook (Metric), American Concrete Institute, 2010 (130728.1)
7. Kosmatka, Steven H. Michelle L. Wilson. Design and control of concrete mixtures: the guide to applications, methods, and materials, 2011. (128769.1)
8. Concrete repair manual: two volume set Edition:3rd ed. American Concrete Institute, 2008 (128804.1)

BFS 40903 Advanced Structure Design
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Reinforced concrete is one of the most commonly composite materials used for building structures. Reinforced concrete has the advantage of being formed into any desired shape most conveniently. Meanwhile, steel and steel-concrete composite structures are widely used especially for the purposes of rapid construction and as the industrialized building system. This course introduces students to the design of advanced reinforced concrete, steel and steel-concrete composite structures according to the relevant code of practice. Scope of study includes introduction of seismic design, water retaining structure, advanced slab, concrete wall, plate girder, composite beam and slab and steel connections.

References

1. Prab Bhatt, T.J. MacGinley, and Ban Seng Choo; Reinforced Concrete: Design Theory and Examples, Taylor & Francis; 3rd edition; 2005, TA683.2M33 2005
2. L. J. Morris, D. R. Plum: Structural Steelwork Design to BS5950: TH1611 .M67 1996
3. Bill Mosley, Ray Hulse: Reinforced concrete design to Eurocode 2: TA683.2 .M68 2007
4. W. H. Mosley, J. H. Bungey and R. Hulse: Reinfor concrete design: TA683.2 .M67 1999
5. Dennis Lam, Thien-Cheong Ang and Sing-Ping Chiew; Structural Steelwork Design To Limit State Theory; Elsvevier Butterworth Heinemann; 3rd edition; 2004. TA684. L35 2004

BFS 41003 Finite Element Analysis
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

The application timber as structural material in Civil engineering is widely used especially for the purposes of rapid construction, higher strength to weight ratio, ease of erection, aesthetic value, etc. This course introduces students to the design of engineered timber structures using laminated veneer lumber and glued laminated lumber. The basics to timber design are required in this course. Scope of study includes flexural member design, timber slab system design, compression member design, tension member with axial load design, combined member with axial load and flexural load design, connection design, and introduction to Eurocode 5.

References

1. J. G. Eisley & A. M. Waas, Analysis of Structures: An Introduction Including Numerical Methods, 1st Edition, John Wiley & Sons, Sussex, 2011. (TA647.E37).
2. D. Menon, Advanced Structural Analysis, 1st Edition, Alpha Science, Oxford, 2009. (TA645.M464).
3. T. R. Chandrupatla and A. D. Belegundu, Introduction to Finite Elements in Engineering, 4th Edition, Pearson, New Jersey, 2012. (TA347.C46).
4. O. C. Zienkiewicz, R. L. Taylor & J. Z. Zhu, The Finite Element Method: Its Basis and Fundamentals, 7th Edition, Butterworth-Heinemann, Oxford, 2013. (TA640.2. Z535).
5. O. C. Zienkiewicz, R. L. Taylor and D. D. Fox, The Finite Element Method for Solid and Structural Mechanics, 7th Edition, Butterworth-Heinemann, Oxford, 2013. (TA640.2. Z54).
6. J.N. Reddy, An Introduction to Finite Element Method, 3rd Edition, McGraw Hill, New York, 2006. (TA347.F5.R43).
7. D. L. Logan, A First Course in the Finite Element Method, 2nd Edition, Thomson, Toronto, 2012. (TA347.F5.L64).
8. C. V. G. Vallabhan, Finite Element Method for Engineers: From Theory to Practice, 1st Edition, Alpha Science, 2011. (TA347.F5.V34).

BFK40303 Advanced Timber Structural Design
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

The application timber as structural material in Civil Engineering is widely used in developed countries especially for the purposes of rapid construction, higher strength to weight ratio, ease of erection, aesthetic value, green building, sustainability, low carbon emission and etc. This course introduces students to the design of engineered timber structures using laminated veneer lumber and glued laminated lumber with the approach of limit state design. The basics to timber design are required in this course. Scope of study includes the design of flexural member, compression member, tension member, member with combined flexural and axial actions, timber-concrete composite floor, and timber portal frame.

References

1. BS EN 1995 Part 1, 2004; Eurocode 5 for Design of timber structures. (Access UTHM library > British Standard Online BSOL) https://bsol-bsigroup-com.ezproxy.uthm.edu.my/Search/Search? searchKey =bs+en+1995-1-1%3A2004%2Ba2%3A2014&OriginPage=Header+Search+Box&autoSuggestion= true
2. Jack Porteous & Peter Ross; Designers' Guide to Eurocode 5: Design of timber buildings; Institution of Civil Engineers ICE Publishing, London; 2013, (TA666 .P67 2013).
3. Chanakya Arya; Design of structural elements: concrete, steelwork, masonry and timber design to British Standards and Eurocodes; Spon Press, London: 2003, (TA658 .A79 2003). https://ezproxy.uthm.edu.my/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=275553&site=ehost-live&scope=site&ebv=EB&ppid=pp_C
4. Jack Porteous & Abdy Kermani; Structural Timber Design to Eurocode 5, 2nd Edition; Wiley Blackwell, UK; 2013, (TA666 .P67 2013) https://ebookcentral-proquest-com.ezproxy.uthm.edu.my/lib/uthm-ebooks/detail.action?docID=1174133
5. Buchanan, A.H.; Timber Design Guide; New Zealand Timber Industry Federation Inc.; 2007
6. NZS3603: 1993; Code of Practice for Structural Timber Design; New Zealand

BFW 40103 Water Resources Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Water resources engineering involved in analyzing and managing the quantity and quality of water in natural and developed systems. This course introduces students to establish the knowledge and understanding in planning, design and operation of water resources projects with emphasis on hydrology and hydraulic structures. Scope of study includes introduction to water resources engineering, water balance modelling, statistical and probability in water resources, runoff estimation methods, flood control and mitigation and water withdrawals and uses.

References

1. David A. Chin. Water Resources Engineering, 3rd edition, Pearson Education, 2012.
2. David A. Chin. Water Resources Engineering, 2nd edition, Prentice Hall, 2006. Call Number: TC145 .C44 2006.
3. Larry W. Mays, Water Resources Engineering, 2nd edition, John Willey & Sons, 2011. Call Number: TC169.M39 2011.
4. Patra K.C. Hydrology and Water Resources Engineering, 2nd Edition. Alpha Science International Ltd, 2008.
5. Wurbs, Ralph Allen, Water resources engineering, 2002. Call Number: TC145 .W87 2002.
6. JPS. Urban Stormwater Management Manual for Malaysia. Publications Unit, Ministry of Agriculture and Fisheries Malaysia, 2000.

BFW 40103 Water Resources Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Water resources engineering involved in analyzing and managing the quantity and quality of water in natural and developed systems. This course introduces students to establish the knowledge and understanding in planning, design and operation of water resources projects with emphasis on hydrology and hydraulic structures. Scope of study includes introduction to water resources engineering, stream flow estimation methods, stream flow estimation by using urban storm water management manual (MSMA), rainfall-runoff modelling, flood control and mitigation, dam and spillways, flood routings, statistic and probability in water resources management, agriculture and irrigation development.

References

1. Mays L.W. (2001). Water Resources Engineering. New York: John Wiley. Call no.: TC169.M39 2001 N1
2. Patra K.C. (2008). Hydrology and Water Resources Engineering, 2nd Edition. Oxford: Alpha Science International Ltd. Call no.: GB661.2.P37 2008
3. Chin D.A. (2006) Water Resources Engineering, 2nd Edition. Prentice Hall New York. Call no.: TC145.C44 2006
4. Brutsaert W., (2005). Hydrology: An Introduction. Cambridge University Press. Call no.: GB661.2 .B78 2005
5. Department of Irrigation and Drainage Malaysia. (2000). Urban Stormwater Management Manual for Malaysia. Kuala Lumpur: Dept. of Irrigation and Drainage, 2000. Call no.: TD657.U72 .M3 2000 v.1

BFW 40303 Coastal and Harbour Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Coastal and harbour engineering relates to the principles of wave engineering and its concepts and theories regarding to waves and the basic design factors. Scope of study includes Introduction to Coastal Engineering: definition, coastal engineering activities, management of coastal engineering, coastal monitoring and control techniques; Characteristics of Coastal Waves: introduction, definition of wave parameters, types of waves, theory of waves, phenomena of tides and nearshore currents; Linear and Nonlinear Wave Theories: introduction, coastal wave parameters, Stokes, Korteweg de Vries and Boussinesq, cnoidal, solitary wave theories; Coastal Waves Transformation Processes: wave breaking, shoaling, refraction, diffraction, reflection; Coastal Protection Structures: introduction, types of coastal structures, effects of waves, wind and seawater towards coastal structure, beach nourishment, coastal protection structure designs; Harbour Planning and Design Procedure: impact on coastal area, harbor engineering design considerations, harbour development and design procedures.

References

1. Kim, Y. C. (ed.) (2010). Handbook of Coastal and Ocean Engineering. Hackensack, NJ: World Scientific. Call number: TC330.H37 1990.
2. Kamphuis, J. W. (2010). Introduction to Coastal Engineering and Management, 2nd ed. NJ: World Scientific. Call number: TC205.K35 2010.
3. Shibayama, T. (2009). Coastal Processes: Concepts in Coastal Engineering and Their Application to Multifarious Environment. Singapore: World Scientific. Call number: TC205.S54 2009.
4. Dean, R. G. & Dalrymple, R. A. (2002). Coastal Processes with Engineering Applications. New York: Cambridge University Press. Call number: TC205.D42 2002.
5. French, P. W. (2001). Coastal Defences: Processes, Problems and Solutions. New York: Routledge. Call number: TC330.F73 2001.

BFW 40403 Groundwater Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Water from beneath the ground has been exploited for domestic use, livestock and irrigation since the earliest times. Successful methods of bringing the water to the surface have been developed and groundwater use has grown consistently ever since. This course introduces students to the functions and terminology requisite to the study of groundwater engineering. Scope of study includes Introduction to Groundwater Engineering: history, groundwater utilization in Malaysia, hydrologic cycle, influence of soil characteristics, vertical distribution of groundwater, zone of aeration and saturation; Movement of Groundwater: Darcy law, groundwater characteristics, types of aquifer, groundwater flow, unsteady groundwater flow, tracers of groundwater; Groundwater Hydraulics: one-dimensional steady flow, steady radial flow into a well, unsteady radial flow in confined and unconfined aquifers; Water Well: hole test and bore log, shallow well construction, deep well drilling, well installation and construction, well tests, pumping equipment; Groundwater Contamination: contamination, sources and effect, contamination weakness, distribution of below ground contamination, assessment of contamination potential, monitoring groundwater quality; Groundwater Management: concept of basin management, water balance, investigation of groundwater basin, data collection and field works, basin management with conjunctive use; Techniques of Groundwater Model: porous media model, analog model, electrical analog model, digital computer model; Groundwater Subsurface Investigation: drill test, water level measurement, geophysics, resistivity, spontaneous potential, lighting, temperature, compass, conductivity-liquid log.

References

1. Mohammad Karamouz, Ahmadi, A. & Akhbari, M. (2011). Groundwater Hydrology: Engineering, Planning, and Management. Boca Raton: CRC Press. Call number: TC176.M52 2011.
2. Taniguchi, M. & Holman, I. P. (2010). Groundwater Response to Changing Climate. Leiden; New York: Taylor & Francis. Call number: XX(131116.1) Being catalogued.
3. Younger, P.L. (2007). Groundwater in the Environment: An Introduction. Malden, MA: Blackwell. Call number: GB1003.2.Y68 2007.
4. Montgomery, J. H. (2007). Groundwater Chemicals: Desk Reference. Boca Raton, FL: CRC Press. Call number: TD426.M66 2007 r.
5. Todd, D. K. & Mays, L. W. (2005). Groundwater Hydrology. Hoboken, NJ: John Wiley. Call number: GB1003.2.T624 2005.
6. Fitts, C. R. (2002). Groundwater Science. Amsterdam: Academic Press. Call number: GB1003.2.F57 2002.

BFW 40503 Urban Stormwater Management
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Stormwater hydrology is an area of hydrological practice that is aimed at managing both the quantity and quality of runoff from urban environments based on the Urban Stormwater Management Manual of Malaysia (MSMA). This course introduces students to the importance of stormwater drainage systems for establishing sustainable urban development. Scope of study includes the Introduction: Stormwater quantity and quality design criteria, unified design criteria and site development, institution and framework of regulation, authority requirement and documentation, processes of plan; Fundamental Design and Runoff Quantity Estimation: Introduction, concept of hydrology design, fundamental of hydraulic, design rainfall, estimation of runoff, flow and routing; Fundamental Design and Runoff Quality Estimation: Introduction, characteristics, fundamental design and control of contamination, estimation of contaminant - transport and retention; Runoff Quantity Control: Principles of quantity control, detention: on-site, community and regional, retention: on-site, community and regional; Runoff Conveyance: Roof, property drainage and stormwater inlets, pipe and open drains, culvert, engineered waterways and hydraulic structures; Best Management Practices on Runoff Quality Controls: Post construction on source control and treatment control, during construction on construction sediments.

References

1. Department of Irrigation and Drainage Malaysia. (2000). Urban Stormwater Management Manual for Malaysia. Kuala Lumpur: Dept. of Irrigation and Drainage, 2000. Call no.: TD657.U72.M3 2000 v.1.
2. McCuen R. H. (2005). Hydrologic Analysis and Design, 3rd Edition. Prentice Hall. Call no.: TC145.M38 2005.
3. Mays L.W. (2001). Water Resources Engineering. New York: John Wiley. Call no.: TC169.M39 2001 N1.
4. Patra K.C. (2008). Hydrology and Water Resources Engineering, 2nd Edition. Oxford: Alpha Science International Ltd. Call no.: GB661.2 .P37 2008
5. Chin D.A. M (2006). Water Resources Engineering, 2nd Edition. Prentice Hall New York. Call no.: TC145.C44 2006.
6. REDAC, USM. (2005). Urban Stormwater Short Course: Application of MSMA for Sustainable Urban Drainage System (SUDS). Penang: Universiti Sains Malaysia. Call no.: TD665.U72 2005.

BFW 40603 Sediment Transport
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

The course includes open channel flow, properties of transport material, initiation of particle motion, transport mechanism, bed forms, alluvial roughness, bed material transport, stable channels, river bed variations, and local scour.

References

1. Department of Irrigation and Drainage Malaysia. (2000). Urban Stormwater Management Manual for Malaysia. Kuala Lumpur: Dept. of Irrigation and Drainage, 2000. Call no.: TD657.U72 .M3 2000 v.1.
2. McCuen R. H. (2005). Hydrologic Analysis and Design, 3rd Edition. Prentice Hall. Call no.: TC145 .M38 2005.
3. Mays L.W. (2001). Water Resources Engineering. New York: John Wiley. Call no.: TC169 .M39 2001 N1.

4. Patra K.C. (2008). Hydrology and Water Resources Engineering, 2nd Edition. Oxford: Alpha Science International Ltd. Call no.: GB661.2 .P37 2008.
5. Chin D.A. M (2006). Water Resources Engineering, 2nd Edition. Prentice Hall New York. Call no.: TC145 .C44 2006.
6. REDAC, USM. (2005). Urban Stormwater Short Course: Application of MSMA for Sustainable Urban Drainage System (SUDS). Penang: Universiti Sains Malaysia. Call no.: TD665 .U72 2005.

BFT 40203 Pavement Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

A good pavement contributes to a large extent to the quality of road. A road cannot function properly unless its pavement provides adequate, smooth and serviceable support for the load imposed by traffic at all times. This course introduces students to the principles of mechanistic-empirical approach in pavement analysis and design for new and existing pavement of road and airfield. Scope of study includes mechanistic models of pavement, mechanistic characterization of pavement materials, evaluation of pavement structural condition and pavement management system.

References

1. Huang, Yang H., Pavement Analysis and Design, 2nd Edition, Pearson, Prentice Hall, USA, 2003. TE251 .Y36 2003
2. Papagiannakis, A.T., and E.A. Masad, Pavement Design and Materials, John Wiley & Sons (New York), 2008. TE250 .P36 2008
3. Shahin, M.Y., Pavement Management for Airports, Roads, and Parking Lots, (2nd Edition) Springer Science+Business Media (New York), 2005. TE250 .S53 2005
4. Flaherty C.A., The Location, Design, Construction & Maintenance of Pavements, Butterworth Heinemann, United Kingdom, 2002. TE145 .H53 2002

BFT 40303 Transportation Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Transportation Engineering is a branch of civil engineering dealing with the design of transportation facilities. The design aspects of transportation engineering include the design of rail, air and water transportation facilities. This course will provide essential engineering knowledge in transportation engineering which covers the fundamentals needed for practitioners at the entry level to the industry. This course introduces students to applications of transportation engineering as part of civil engineering design and construction to accommodate future demand. The scope includes the introduction to transportation, sustainable transportation, and the design of rail, air and water transportation facilities.

References

1. Kutz, M., Handbook of Transportation Engineering, McGraw Hill, 2011. [TA1151.H36 2011]
2. Khisty, C.J., Transportation Engineering: An Introduction, Prentice Hall, 2003. [TA1145.K44 2003]
3. Thoresen, C.A., Port Designer's Handbook, ICE, 2014. [C205.T48 2014]
4. American Railway Engineering and Maintenance-of-Way Association, Manual for Railway Engineering, AREMA, 2011. [TF145.A43 2011]
5. Ashford, N., Airport Engineering : Planning, Design and Development of 21st Century Airports, Wiley, 2011. [TL725.3.P5 .A83 2011]
6. Bazzan, A.L.C., Introduction to Intelligent Systems in Traffic and Transportation, Morgan & Claypool, 2014. [TE228.3.B39 2014]
7. Vanek, F.M., Sustainable Transportation Systems Engineering, McGraw Hill, 2014. [HE151.S98 2014]

BFT 40503 Advanced Traffic Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

This course is intended for undergraduate students in civil engineering. This course will provide essential engineering knowledge in traffic engineering, which covers the fundamentals required for practitioners at the entry level to the industry. The scope of study includes advanced theories, concepts and practices in traffic flow modelling, quantifying arterial road performance, intersection traffic control systems and evaluation, and application of software in traffic engineering.

References

1. Garber, N.J., Traffic and Highway Engineering (TE145 .G37 2002; TE145 .G37 2009)
2. Roess, R.P., Traffic Engineering (HE355 .M65 2004)
3. Mannering, F.L., Principles of Highway Engineering and Traffic Analysis (TE147 .M36 2005; TE145 .M36 2009; TE145 .M36 2013)
4. Slinn, M., Traffic Engineering Design: Principles and Practice (HE333 .S54 1998 N1)
5. Currin, T.R., Introduction to Traffic Engineering: A Manual Data Collection and Analysis (HE333 .C87 2001; HE333 .C87 2013)

BFT 40603 Road Safety Engineering
(Pre-requisite: Completed 114 Credit Hours)

Synopsis

Road Safety is a global issue that is faced by all countries in the world. Road safety problem has been handled by implementing the accident reduction and prevention techniques. Road accident is defined as a multi-factor event which mainly consists of human, environment and vehicle factors. This course introduces students to the engineering of road safety in term of crash, counter measures and evaluation. Scope of study includes introduction to road safety, data collection, crash investigation, analysis and diagnosis, implementation of road safety improvement and evaluation, and lastly road safety audit stage 1 to stage 4. Evaluation will cover both the effectiveness of road safety project as the accident reduction technique and road safety audit as the accident prevention technique.

References

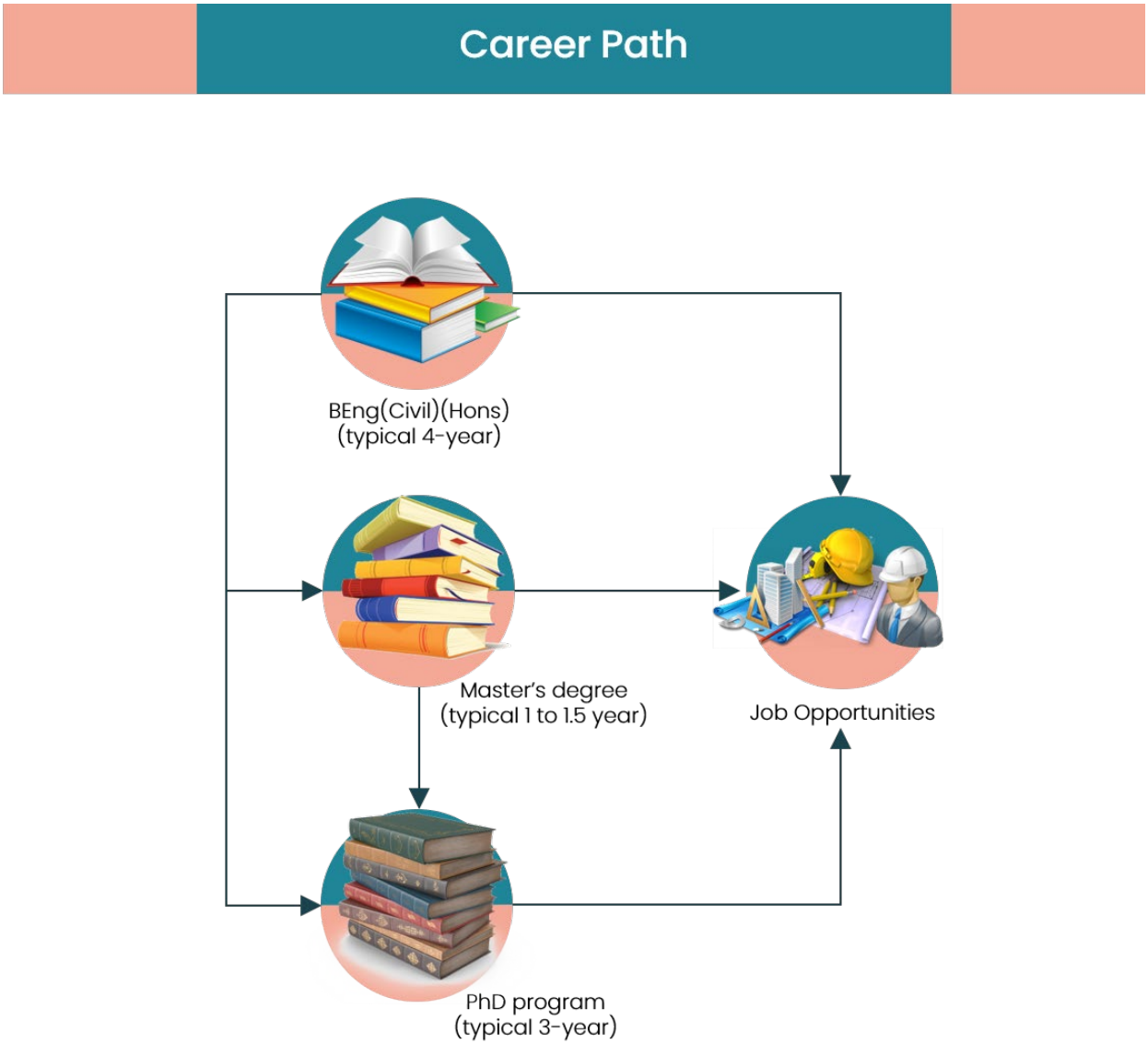
1. Garber N.J, Hoel L.A., Traffic and Highway Engineering, 3rd Edition, California, Brooks/Cole, 2009 [TE145 .G37 2009]
2. Road Engineering Association of Malaysia (REAM), Road Safety Audit Training Programme 2008, 2008. (CD-ROM and Buku) [TE228 .R62 2008]
3. IKRAM & TRL; Interim Guide on Identifying, Prioritising and Treating Hazardous locations on roads in Malaysia; 1995.
4. JKR, Road Safety Audit: Guidelines For the Safety Audit Of Roads and Road Projects in Malaysia. 2002.
5. NCHRP Research Results Digest 220, Transportation Research Board; Strategies for Improving Roadside Safety, 1997.
6. Robertson, H.D., Hummer, J.E., dan Nelson, D.C.; Manual of Transportation Engineering Studies, New Jersey: Prentice Hall; 1994.
7. Peterson, A. Road Safety Manual: Recommendation from the World Road Association (PRIAC). Swanley, Route 2 Market. 2005

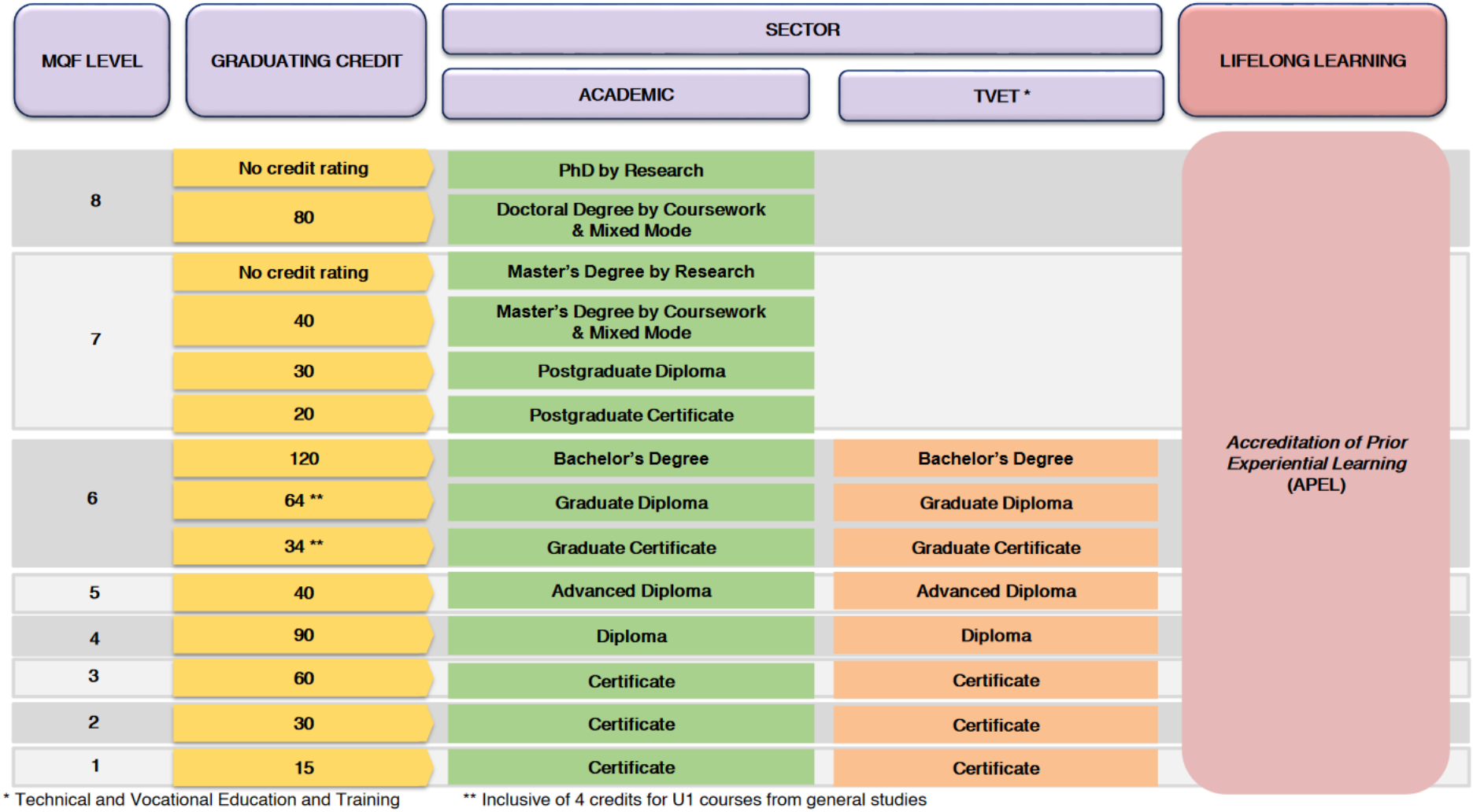
Career and Further Education Prospect

Career in Civil Engineering

Civil engineering is one of the oldest engineering disciplines. It deals with the design, construction, and maintenance of physical and natural built environment, including buildings, roads, bridges, dams, and canals. It is a wide-ranging profession, including different sub-disciplines, structural engineering, materials science, geotechnical engineering, water resources, surveying, and transportation engineering.

Civil engineering offers many opportunities as well as the satisfaction of helping to improve and enhance public quality of life in many settings. Career in civil engineering: Project Engineers, Surveyors, Project Coordinator, Traffic Engineer, Geotechnic Engineer, Hydrology Engineer, Researchers and Academicians.





Source: Malaysian Qualifications Agency (MQA, 2021)

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Faculty of Civil Engineering and Built Environment
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