ACADEMIC PROFORMA
2019/2020

FKAAS

BACHELOR OF CIVIL ENGINEERING WITH HONOURS

SETARA TIER 4

FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING
Universiti Tun Hussein Onn Malaysia
86400, Parit Raja, Batu Pahat, Johor
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Universiti Tun Hussein Onn Malaysia
August 2019
## Contents

- Foreword from Vice Chancellor: 3
- Foreword from Deputy Vice Chancellor (Academic and International): 4
- Foreword from Dean, Faculty of Civil and Environmental Engineering: 5
- Vision of University: 6
- Mission of University: 6
- Education Philosophy of University: 6
- Logo of University: 6
- Board of Directors of University: 9
- Members of Senate: 10
- Faculty of Civil and Environmental Engineering: 13
- Vision of Faculty Civil and Environmental Engineering: 13
- Mission of Faculty Civil and Environmental Engineering: 13
- Adjunct Professor at Faculty Civil and Environmental Engineering: 16
- Visiting Professor at Faculty Civil and Environmental Engineering: 16
- External Examiner at Faculty Civil and Environmental Engineering: 16
- Industrial Advisor at Faculty Civil and Environmental Engineering: 16
- Faculty Civil and Environmental Engineering Staff Directory: 17
- Aims of Programme: 33
- Programme Educational Objectives (PEO): 33
- Programme Learning Outcomes (PLO): 33
- Curriculum Structure: 35
- Synopsis of University Courses: 38
- Synopsis of Faculty Civil and Environmental Engineering Core Course: 45
- Career and Further Education Prospect: 80
Foreword from Vice Chancellor

Assalammualaikum Warahmatullahi Wabarakatuh and Greetings.

Congratulations and welcome to all new students. We appreciate your trust for choosing to be with UTHM in continuing your endeavor for success in your future career and towards prosperous life.

In line with Ministry of Education Malaysia aspirations in transforming learning and teaching process to be more flexible, organic, dynamic and effective, several initiatives and innovations have been and will be implemented at UTHM. These initiatives and innovations which integrate conventional methods of delivery with online/virtual delivery methods have presented the Full Online Classroom (FOC), Smart Classroom, Flip Learning, Massive Open Online Course (MOOC) and many more. Besides, more emphasis will be given on Science, Technology, Engineering and Mathematics (STEM), in line with Ministry aspirations to uphold science and technology consistent with IR4.0 development. Apart from that, elements such as fun, happiness, love and kindness are embedded in all the curriculums offered at UTHM to ensure learning and teaching process can achieve goals of University in producing balanced graduates in terms of emotional, mental and physical based on tauhidic paradigm.

For your knowledge, University’s top management continues to seek, design, and adapt effective and efficient approaches which are able to have great impact towards making UTHM a renowned Higher Education Institution. Success in being rated four stars by QS Star Rating 2017 and being recognised within the Top 300 by QS World University Ranking by Subject 2017 in the field of Mechanical, Aeronautical and Manufacturing Engineering, as well as in Electrical and Electronic Engineering, have proved that UTHM is committed in producing world class academic programmes. These achievements are driven by vision and mission of University, which are continually strengthen and streamlined.

Last but not least, I believe that you will become a successful University graduate and would continue University tradition of academic excellence. I am also confident that you as a graduate, will become a member of the community whom are able to apply knowledge gained and are able to contribute good deeds, service and expertise for the Religion, Race and Nation.

All the Best.

Y. BHG. PROFESSOR 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 the opportunity to congratulate all new students who have been chosen to further their studies at Universiti Tun Hussein Onn Malaysia beginning this 2019/2020 session. Congratulations is also extended to Centre for Academic Development and Training for successfully publishing this proforma which serve as a guide for students in planning their learning at the University beginning the first semester till graduation.

For your information, higher education in Malaysia has evolved from teacher-centered learning to student-centered learning. Besides that, much initiatives have been rolled out towards 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 curriculum to ensure 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 related industries and students and local community are delivered through CEO@Faculty programs.

Further, online learning platform known as Massive Open Online Course (MOOC) has been introduced and Full Online Class (FOC) session is implemented every semester. These are new initiatives implemented at UTHM to provide opportunities to students to explore knowledge without the need to be physically present in classroom. Students also have the opportunity to take a break from the University for a period of time by enrolling in Gap Year program. It gives student a break to reflect and take ownership for their experiences through programs such as volunteerism, entrepreneurial, sports, and others.

I do hope that with all the initiatives which have been and will be rolled out by UTHM, you will gain valuable experiences while 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 programs prepared by UTHM. In order to achieve UTHM 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.

Last but not least, 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 development of religion, race and nation.

“WITH WISDOM WE EXPLORE”

PROFESSOR DR. ISMAIL BIN ABDUL RAHMAN
Deputy Vice Chancellor (Academic and International)
Universiti Tun Hussein Onn Malaysia
Foreword from Dean
Faculty of Civil and Environmental Engineering

Salam sejahtera and Greetings

I would like to congratulate all new students at the Faculty of Civil and Environmental Engineering (FKAAS) UTHM for the 2019/2020 academic session. All of you are very fortunate to have been selected to enter this University, which is well-equipped with current infrastructure and conducive teaching and learning environment. Being selected to this university is a great privilege that should not be wasted. This is due to the fact that the education process at the tertiary level requires continuous effort and commitment so that the knowledge gained can produce students who are excellent in all aspects in accordance with the needs of industries and Nation.

In order to accomplish the faculty’s mission which is to produce and train competitive professionals of high ethical values, you will be guided by qualified, committed, and responsible academic staff. FKAAS offers an academic programme based on various areas related to civil engineering and architecture field as well as focuses on sustainable technology to feed the need of future development. To enhance students’ understanding and creativity, the faculty provides laboratories equipped with the latest equipment and assisted by well-trained Assistant Engineers. Students will also have to undergo practical work in the field relevant to the current industrial needs.

Therefore, you must take this opportunity to work extremely hard in order to achieve the aspirations of not only your parents but also the community and the country. Systematic planning of teaching and learning will produce outstanding graduates.

Thank you.

ASSOC. PROF. Ir. Ts. DR. MOHD IRWAN BIN JUKI
Dean
Faculty of Civil and Environmental Engineering
Universiti Tun Hussein Onn Malaysia
Vision
Towards a world class university in engineering, science and technology for sustainable development.

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

Education Philosophy of University
The education and training practice in this university is a continuous effort to become the leader in market oriented academic programmes. These programmes are student-focused and are conducted through experiential learning in order to produce well trained human resource and professionals who are catalysts for sustainable 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.
Duli Yang Maha Mulia Sultan Ibrahim Ibni Almarhum Sultan Iskandar
Sultan Yang Dipertuan Bagi Negeri Dan Jajahan Takluk Johor Darul Ta'zim
Pro Chancellor I

Duli Yang Amat Mulia Tunku Ismail Ibni Sultan Ibrahim
Tunku Mahkota 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' Dr. Mohd Sofi Osman
Managing Director & Vice President
PEN Operations

Members

Y. Bhg. Prof. Ts. Dr. Wahid bin Razzaly
Vice Chancellor
Universiti Tun Hussein Onn Malaysia

YB Dato' Haji Nooh bin Gadot
Advisor
Majlis Agama Islam Johor

YBhg. Datuk Ts. Pang Chau Leong
Member
Board of Directors

YBhg. Dato’ Ir. Dr. Haji Abdul Rashid bin Maidin
Akademi Profesional Koperasi Serbaguna Anak-anak Selangor Berhad (KOSAS)

YBrs. En. Ahmad Luqman bin Mohd. Azmi
Chief Operations Officer
Malaysia Airlines Berhad

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

YBhg. Dato’ Prof Ir. Dr. Mohd Saleh bin Jaafar
Ministry of Education Malaysia

YBhg. Prof. Dr. Mohd Idrus bin Mohd Masirin
Universiti Tun Hussein Onn Malaysia

Alternative Member

YBrs. Pn. Mazula binti Sabudin
Ministry of Education Malaysia

Secretary

En. Abdul Halim bin Abdul Rahman
Registrar
Universiti Tun Hussein Onn Malaysia
Members of Senate

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

Members
Prof. Dr. Hj. Ismail bin Abdul Rahman
Deputy Vice Chancellor (Academic and International)

Prof. Ts. Dr. Ruzairi bin Abdul Rahim
Deputy Vice Chancellor (Research and Innovation)

Assoc. Prof. Dr. Afandi bin Ahmad
Deputy Vice Chancellor (Student Affairs and Alumni)

Prof. Dato’ Dr. Abdul Razak bin Hj. Omar
Provost UTHM Pagoh Campus

Prof. Dr. Ahmad Tarmizi bin Abd Karim
Assistant Vice Chancellor (Strategic Planning and Corporate Relations)

Prof. Madya Dr. Wan Fauzi @ Fauziah bt. Wan Yusoff
Assistant Vice Chancellor (Financial Sustainability)

Prof. Dr. Azme bin Khamis
Dean, Centre for Graduate Studies

Assoc. Prof. Ir. Ts. Dr. Mohd Irwan Bin Juki
Dean, Faculty of Civil and Environmental Engineering

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

Assoc. Prof. Dr. Shahruddin bin Mahzan @ Mohd Zin
Dean, Faculty of Mechanical and Manufacturing Engineering

Assoc. Prof. Dr. Mohd Lizam bin Mohd Diah
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

Assoc. Prof. Dr. Mohd Kamarulzaki bin Mustafa
Dean, Faculty of Applied Science and Technology

Assoc. Prof. Amran bin Mohd Zaid
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
Dr. Zailin Shah binti Yusoff  
Dean, Centre for Language Studies

Assoc. Prof. Dr. Ishak bin Baba  
Director, Centre for Academic Development and Training

Prof. Dr. Rosman bin Md. Yusoff  
Director, Institute for Social Transformation and Regional Development

Prof. Ir. Dr. Abdul Aziz bin Abdul Samad  
Faculty of Civil and Environmental Engineering

Prof. Dr. Mohd. Idrus bin Mohd. Masirin  
Faculty of Civil and Environmental Engineering

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

Prof. Dr. Mohd. Amri bin Lajis  
Faculty of Mechanical and Manufacturing Engineering

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

Prof. Sr. Dr. David Martin @ Daud Juanil  
Faculty of Technology Management and Business

Prof. Ts. Dr. Noraini binti Kaprawi  
Faculty of Technical and Vocational Education

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

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

Prof. Dr. Khalid bin Hasnan  
Faculty of Engineering Technology

Ir. Ts. Shamrul-Mar bin Shamsuddin  
Director, Office of Development and Maintenance

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

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

Pn. Azizah binti Nasri  
Bursar

Pn. Zaharah binti Abd Samad  
Acting Chief Librarian

Pn. Norliah binti Yaakub  
Head of Legal Unit
Faculty of Civil and Environmental Engineering

Faculty Vision
Aspires to lead the application of civil and environmental engineering knowledge in providing innovative and sustainable solutions for the benefits of mankind.

Faculty Mission
To produce and train professionals who are creative, innovative, competent and responsible to fulfill the societal and environmental needs in a progressive and sustainable manner

Faculty of Civil and Environmental Engineering (FoCxEE) was established on May 1, 2004 when the university conducted a restructuring of faculties. Currently, FoCxEE is the combination of three (3) departments consist the Civil Engineering Department, The Architecture Department And The Postgraduate Department. The Department of Engineering had existed since September 13, 1993 when the Polytechnic Staff Training Centre was established while the Department of Construction & Environmental Engineering Technology was established on September 30, 2000 when the Institut Teknologi Tun Hussein Onn (ITTHO) was upgraded to Kolej Universiti Teknologi Tun Hussein Onn (KUITTHO) and then to Universiti Tun Hussein Onn Malaysia (UTHM).

FoCxEE offers academic programmes to students at Bachelor and Postgraduate levels. FoCxEE is established with the aim of conducting academic programmes specially designed towards the achievement of the Faculty vision and mission as well as conducting innovative research and development in accordance with the needs of the Nation. Apart from offering competitive academic programmes, FoCxEE also serves as the reference centre in the field of environmental-friendly civil engineering and construction technology. The qualities and global competitiveness of the programmes offered by FoCxEE are proven with the 5-year accreditation by the Board of Engineers Malaysia (full signatory status of the Washington Accord since June 18, 2009).

The faculty, consisted of three (3) departments is led by a Dean and assisted by three (3) Deputy Deans. Organisation chart of FoCxEE is depicted as the diagram below.
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 PENGIKTIKIRAFAN 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 TAHAB
Yang Dipertua

Ir. HIZAMUL-DIN AB. RAHMAN
Pendaftar

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

Tarikh Perakuan Dikebaskan: 22.5.2017
PERAKUAN AKREDITASI

AGENSI KELAYAKAN MALAYSIA DENGAN INI MEMPERAKUAN BAHAWA PROGRAM

Sarjana Muda Kejuruteraan Awam dengan Kapujian

YANG DIKENDALIKAN OLEH

Universiti Tun Hussein Onn Malaysia (UTHM)

DI ALAMAT

Parit Raja
86400 Batu Pahat, Johor

TELAH MENCAZAI STANDARD JAMINAN KUALITI YANG TELAH DIETAPKAN OLEH AGENSI DAN
MEMATUHI KERANGKA KELAYAKAN MALAYSIA

Tahap 6

TARIKH AKREDITASI : 01/01/2013 hingga 31/12/2021

[Signature]

[Note: The text is in Malay, discussing the accreditation of a program by the Malaysian Qualifications Agency (MQA). It states that the program meets the standard and is accredited by the agency from January 1, 2013, to December 31, 2021.]
Faculty Visiting Professor

Profesor Dr. KOICHIRO OHGUSHI
Saga University of Japan

Faculty External Examiner

Associate Professor Ir. Adnan bin Zulkiple
Universiti Malaysia Pahang

Prof. Madya Dato’ Ar. Dr. Ku Azhar Bin Ku Hassan
Universiti Sains Malaysia

Ar. Kelvin Ong U-Lin
Arkitek U-Lin

Faculty Adjunct Professor

Ir. Hj. Abdullah Isnin
Deputy Head Of Director (Business Sector)
Department of Drainage and Irrigation
Ministry of Water, Land and Natural Resources

Faculty Industrial Advisors

Ir. Dr. Kamarul Anuar Mohamad Kamar
Deputy General Manager
UEM Group Berhad

Ir. Dr. Mohd Farid Ahmad @ Majid
Chairman
Farid Ahmad Consulting Engineers

Ir. Wan Hasitinaziah Mohd Hassan
Corporate Division
Department of Drainage and Irrigation
Ministry of Water, Land and Natural Resources

Ir. Syed Mohd Yusof Syed Hussin
Civil Engineer
Amibak Consult Sdn Bhd

Ar. Hj. Mustapha Bin Mohd Salleh
Managing Director
Aliran Interiors Sdn. Bhd
Faculty Staff Directory

Administration

Dean
Associate Professor Dr. Mohd Irwan bin Juki
Ph.D (Civil Engineering) (UiTM), MEng. (Structure) (UTM), BEng. (Hons.) (Civil) (UTM)

Office Secretary
Mdm. Noorhayati binti Othman
Dip Kesetiausahaan Eksekutif (UiTM)

Deputy Dean (Academic and International)
Associate Professor Ts. Dr Mohd Haziman Bin Wan Ibrahim
Ph.D (Civil Engineering) (USM), MEng. (Civil) (UTHM), BEng. (Hons) (Civil) (UiTM), Dip. (Civil Engineering) (ITM)

Deputy Dean (Research, Development and Publication)

Deputy Dean (Student Affairs and Alumni)
Associate Professor Ts. Dr Aeslina Binti Abdul Kadir
Ph.D (Civil Engineering) (RMIT Univ.), MEng. (Civil-Environmental Management) (UTM), BSc. (Env. Science) (UKM)

Office Secretary
Mdm. Juliana binti Mohd Sapuan
Dip. (Management & Office Technology) (UiTM)

Deputy Registrar
Mr. Azlan bin Wanti
Bach. of Psychology (Univ of Utah)

Senior Assistant Administrative Officer (Academic)
Mdm. Siti Hasnah binti Hud
Dip. (Public Administration) (UiTM)

Senior Assistant Administrative Officer (Post Graduate)
Mr. Rosmaidi bin Shahal
STPM (Pusat Tuisyen Afdzal, Kluang)

Assistant Administrative Officer (Finance & Development)
Mdm. Sabariah Binti Md. Supadil
Dip. (Business Management) (PTSS)

Chief Administrative Assistant (Operational & Clerical)
Mr. Encik Mohd Rawi Bin Deris
STPM (Maktab Sultan Ismail)

Senior Administrative Assistant (Operational & Clerical)
Mdm. Norsaliza binti Salleh
SPM (SMK Tun Ismail, Pt. Raja), BMgmt (OUM)

Senior Administrative Assistant (Operational & Clerical)
Mdm. Yasmin Binti Bajuri
Dip. (Public Administration) (UiTM)

Senior Administrative Assistant (Operational & Clerical)
Mr. Zamri Bin Ahmad
Dip. Eng. Elec. (INSTITUT TEKNOLOGI MIDAS)

Senior Administrative Assistant (Operational & Clerical)
Mdm. Rafpidah binti Sarji
STPM (SM Tun Sardon Rengit)

Administrative Assistant (Operational & Clerical)
Mr. Mohd Nazri bin Safri
SPM (SMK Munysi Sulaiman, Batu Pahat)

Assistant Engineer
Mr. Mohd Khairi bin Zainal
Dip. Kej. Elektronik Perhubungan (Politeknik Ibrahim Sultan Johor Bahru)

Office General Assistant
Mr. Mohd Afiq Maula Fauzi
SPM (SEGA)

Assistant Engineer
Mr. Sabari bin Wahab
Cert. (Civil Engineering - Construction) (PUO)
Department of Civil Engineering

Academic Staff

**Associate Professor Dr. David Yeoh Eng Chuan**
Ph.D (Civil Engineering) (Univ. of Canterbury), MEng. (Civil) (UTM), BSc. (Hons.) (Civil Engineering) (UTM), Dip. Ed. (UTM), Cert. (Civil Engineering) (PUO)

**Head of Department**

**Professor Ir. Dr. Abdul Aziz bin Abdul Samad**
PhD (Structure Eng.) (Univ. of Manchester), MSc. (Structure) (Univ. Strathclyde, UK), BSc. (Civil Engineering) (Univ. Glasgow, UK), Dip. (Civil Engineering) (UTM)

**Professor Dr. Ahmad Tarmizi bin Abdul Karim**
Ph.D (Civil & Structural Eng.) (UKM), MEng. (Environmental Eng.) UTM, PGCE (TTTC), BSc. (Eng. Sci.) (UTK, Tennessee, USA)

**Professor Dr. Mohd Idrus bin Hj. Mohd Masirin**
Ph.D (Highway & Transportation Engineering) (Univ. East London, UK), MSc. (Highway & Transportation Engineering) (Univ. East London, UK), BEng. (Civil) (Univ. Han Yang, Seoul), Dip. (Civil Engineering) (UTM)

**Emeritus Professor Ir. Dr. Amir Hashim bin Mohd Kassim**
Ph.D (Hydrology & Water Resources) (Univ. Birmingham, UK), MSc. (Hydrology & Water Resources) (Colorado State Univ., USA), BEng. (Civil) (Univ. Strathclyde, UK), Dip. (Civil Eng.) (UTM)

**Associate Professor Ir. Dr. Abdul Halim Abdul Ghani**
PhD (Civil Eng.)(UTP), MEng (Civil)(UPM), BEng (Civil)(UiTM), Dip (Civil Eng.)(UiTM)

**Associate Professor Ir. Dr. Mohd Irwan bin Juki**
Ph.D (Civil Engineering) (UiTM), MEng. (Structure) (UTM), BEng. (Hons.) (Civil) (UTM)

**Associate Professor Ir. Dr. Tan Lai Wai**
Ph.D (Civil Engineering-Computational Fluid Dynamics) (McGill Univ., Canada), MEng. (Hydraulics and Hydrology) (UTM), BEng. (Civil) (UTM), Dip. (Civil Eng.) (POLIMAS)

**Associate Professor Sr. Dr. Mohd Effendi bin Daud**
Ph.D (Civil Engineering) (Nagoya Univ., Japan), MSc. (Land Surveying) (UTM), BSc. (Land Surveying) (UTM), Dip. (Land Surveying) (UTM)

**Associate Professor Sr. Ts. Dr. Mustaffa bin Anjang Ahmad**
Ph.D (City Planning) (Univ. of Saga, Japan), MSc. (Land Surveying) (UTM), BSc. (Land Surveying) (UTM)

**Associate Professor Ts. Dr. Aeslina binti Abd. Kadir**
Ph.D (Civil Engineering) (RMIT Univ.), MEng. (Civil-Environmental Management) (UTM), BSc. (Env. Science) (UKM)

**Associate Professor Ts. Dr Mohd Haziman Bin Wan Ibrahim**
Ph.D (Civil Engineering) (USM), MEng. (Civil) (UTHM), BEng. (Hons) (Civil) (UiTM), Dip. (Civil Engineering) (ITM)

**Associate Professor Ts. Dr. Adnan bin Zainorabidin**
Ph.D (Geotechnical Engineering) (Univ. of East London, UK), MEng. (Civil) (UTM), BEng. (Civil) (UTHM), DPLI (Edu). (UTHM), Cert. (Civil Engineering) (PPD)

**Associate Professor Ts. Dr. Aziman bin Madun**
Ph.D (Geothical Engineering & Engineering Geology) (Univ of Birmingham, UK), MSc. (Geotechnical Engineering) (UPM), BSc. (Geology) (UKM)
Associate Professor Ts. Dr. Felix Ling Ngee Leh
Ph.D (Civil Engineering) (UTM), MEng. (Civil-Geotechnics) (UTM), BSc. (Civil Engineering) (UTM)

Associate Professor Ts. Dr. Norzila binti Othman
Ph.D (Civil Eng.) (UiTM), Master (Technology Management) (UTM), BSc. (Ecology) (UM)

Associate Professor Ts. Dr. Radin Maya Saphira binti Radin Mohamed
Ph.D (Environmental Eng.) (Murdoch University, Perth), MEng. (Civil) (UTHM), BSc. (Industrial Chemical) (UTM)

Associate Professor Ts. Dr. Rafidah binti Hamdan
PhD (Env. Eng.)(Univ. of Leeds), MEng (Env.) (UTM), BEng (Chem.) (UTM)

Associate Professor Ts. Dr. Zawawi bin Daud
Ph.D (Environmental Eng.) (USM), M.Eng. (Civil Eng.) (UTM), BSc. (Civil Eng.) (UTM), Dip. (Civil Eng.) (PUO), Dip. Education (UTM), Cert. (Civil Eng.) (PUO)

Associate Professor Dr. Mohd Adib bin Mohammad Razi
PhD (Civil)(UiTM), MEng. (Hydraulics & Hydrology) (UTM), BEng. (Civil) (UTM), Dip. (Civil Eng.) (UTM)

Associate Professor Dr. Mohamad Yusri bin Aman
Ph.D (Asphalt Technology) (USM), MEng. (Civil) (UTHM), BEng. (Civil) (UPM), Cert. (Civil Engineering-Construction) (PUO)

Associate Professor Dr. Mohd Ezree bin Abdullah
Ph.D (Civil Engineering) (UTHM), MEng. (Highway & Transport Engineering) (UTM), BEng. (Civil) (UTHM)

Associate Professor Dr. Mohd Hilton bin Ahmad
Ph.D (Univ. of Surrey, UK), MSc. (Structural Eng. & Construction) (UPM), BEng. (Civil) (UM)

Associate Professor Dr. Munzilah binti Md Rohani
PhD (Transportation) (Univ. of Southampton, UK), MEng. (Traffic and Highway) (UTM), BEng. (Civil) (UTM)

Associate Professor Dr. Norwati binti Jamaluddin
PhD (Structure Eng.),(Univ. of Leeds), MEng. (Civil-Structure) (UTHM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTHM)

Associate Professor Dr. Saiful Azhar bin Ahmad Tajudin
Ph.D (Geotechnical Engineering) (Univ of Birmigham, UK), MEng. (Geotechnics) (UTM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTHM)

Ir. Ts. Dr. Raha Binti Abd Rahman
Ph.D (Highway & Traffic Engineering) (UTHM), MEng. Highway & Traffic Engineering) (UPM), BEng. (Civil) (UPM)

Ir. Dr. Shahrul Niza bin Mokhatar
PhD (Civil & Structure Eng.) (Kyushu Univ.), MEng. (Civil-Structural) (UTHM), BEng. (Hons.) (Civil) (UTHM), Dip. Ed. (Civil Engineering) (UTHM)
Ir. Dr. Zainorizuan bin Mohd Jaini
Ph.D (Civil and Computational Engineering) (Univ. of Swansea, UK), MSc. (Finite Element & Computer Modelling) (Univ. Wales, UK), BEng. (Hons.) (Civil Engineering) (UTHM)

Ir. Shamrul-MAR bin Shamsuddin
MEng. (Structure & Construction) (UPM), BEng. (Hons.) (Civil Engineering) (UTHM)

Sr. Dr. Anuar bin Mohd Salleh
Ph.D (Civil Engineering) (UTHM), MSc. (Land Surveying) (UTHM), BSc. (Land Surveying) (UTHM)

Ts. Dr Alvin John Lim Meng Siang
Ph.D (Geotechnical Engineering) (UTHM), BEng. (Civil Engineering) (UTHM)

Ts. Dr. Kamaruddin bin Ambak
Ph.D (Transportation Engineering) (UKM), MSc. (Highway and Transportation Engineering) (UPM), BSc. (Civil Engineering) (UTHM), Cert. (Civil Engineering) (PKB)

Ts. Dr. Mohd Ariff Ahmad Nazri
PhD (Hydrology & Water Resources)(USM), MEng (Civil)(USM), Beng (Civil)(USM)

Ts. Dr. Nor Azizi bin Yusof
Ph.D (Geotechnical Engineering) (Univ. Sheffield, UK), MEng. (Engineering Geology) (UTHM), BEng. (Hons.) (Civil) (UTHM)

Ts. Dr. Norashidah binti Abd Rahman
Ph.D (Civil Engineering) (Univ. of Nottingham, UK), MEng. (Structure) (UTHM), BEng. (Hons.) (Civil) (UTHM), Dip. (Civil Engineering) (UTHM)

Ts. Dr. Hjh. Roslinda binti Seswoya
PhD (Civil)(UTHM), MEng (Civil) (UTHM), BEng (Hons.) (Civil) (UTHM), Dip. (Civil Engineering) (UTHM)

Ts. Dr. Shahiron bin Shahidan
Ph.D (Civil Engineering) (USM), MSc. (Structural Engineering & Construction) (UPM), BEng. (Hons.) (Civil) (UNISEL)

Dr. Adel Ali Saeed Abdah Aligheeti
PhD (Microbiology)(USM), MSc (Microbiology) (Taiz Univ.), BSc (Microbiology)(Taiz Univ.)

Dr. Ahmad Zurisman bin Mohd Ali
Ph.D (Concrete Engineering) (Swinburne Univ.of Technology), MEng. (Civil-Structure) (UTHM), BEng. (Civil) (UTHM), Dip (Civil Engineering) (UTHM)

Dr. Azra Munirah binti Mat Daud
Ph. D (Civil-Environmental) (UWA) AUSTRALIA, MEng. (Civil-Environmental) (UTHM), BEng. (Civil) (UTHM)

Dr. Basil David Daniel
Ph.D (Transportation Engineering) (University Of Canterbury), MSc. (Highway and Transportation Engineering) (UPM), BEng. (Civil) (UM)

Dr. Faisal bin Sheikh Khalid
Ph.D (Civil Engineering) (UTHM), BEng. (Civil Engineering)(UTHM)

Dr. Faizal bin Pakir
PhD (Civil)(UTHM), MEng (Civil) (UTHM), BEng. (Civil) (UTHM), Dip. Ed. (Civil Engineering) (UTHM)
Dr. Goh Wan Inn  
Ph.D (Civil Engineering) (UTHM), BEng. (Civil Engineering)(UTHM)

Dr. Hartini binti Kasmin  
Ph.D (Hydrology and Water Resources) (Univ. Sheffield, UK), MEng. (Hydrology and Water Resources) (UTM), BEng. (Civil) (UTM)

Dr. Hendy Fitrian Suhandri  
PhD (Geodetic Eng)(Univ. of Stuttgart), M.Geomatic Eng. (Univ. of Stuttgart), B.Geodetic & Geomatic Eng.(ITB)

Dr. Masni binti A. Majid  
Ph.D (Engineering Tech & Struc.)(UKM), MEng. (Civil) (UTM), BSc. (Civil Engineering and Education) (UTM)

Dr. Mohd Azlan Bin Mohd Yusoff  
Ph.D (Hydro Informatic) (USM), MSc (Sustainable River Management) (USM), BSc (Civil Engineering) (USM)

Dr. Mohd Firdaus bin Md. Dan @ Azlan  
Ph.D (Civil Engineering) (UTHM), MEng (Civil) (UTHM), BEng. (Civil) (UTHM), Dip. Ed. (Civil Engineering) (UTHM)

Dr. Mohd Hairul Bin Khamidun  
Ph.D (Civil Eng.) (UTM), MSc. (Water Resources Eng.) (UPM), BSc (Civil Engineering) (USM)

Dr. Mohd Hanifi Bin Othman  
Ph.D (Civil Engineering) (UTM), BEng. (Civil Engineering ) (UTHM)

Dr. Mohd Hanif bin Ismail  
PhD (Concrete Eng.)(USM), MEng. (Pengurusan Sungai Lestari) (USM), BSc. (Civil Engineering) (USM)

Dr. Mohd Khaidir bin Abu Talib  
Ph.D (Geotechnical Engineering) (Kyushu Univ.), MEng. (Civil-Engineering) (UKM), BEng. (Civil-Engineering) (UKM), Dip. (Civil)(PPD)

Dr. Mohd Shalahuddin bin Adnan  
Ph.D (Urban and Environmental Engineering) (Kyushu Univ., Japan), Master in Geological Engineering (Gadjah Mada Univ., Yogyakarta), BEng. (Civil) (USM)

Dr. Muhammad Nizam bin Zakaria  
Ph.D (Civil Engineering) (Saga Univ.), MEng. (Civil) (Saga Univ., Japan), BEng. (Civil) (Saga Univ., Japan)

Dr. Muhammad Salleh Bin Haji Abustan  
Ph.D (Civil Eng.) (Kyoto Univ), MEng. (Civil-Environmental Management) (USM), BSc. (Civil Eng.) (USM)

Dr. Nasradeen Ali Khalifa Milad  
PhD (Civil)(UMP), M.IT (UUM), B.Eng (Civil)(College of Technical Science)

Dr. Nazirah Mohamad Abdullah  
PhD (Geomatic Eng)(UTM), M.Geomatic Eng. (UTM), B.Land Surveying(UTM)

Dr. Nicholas Anting Anak Guntur  
Ph.D (Civil Engineering) (UTM), BEng. (Civil Engineering)(UTM)

Dr. Nor Amani Filzah binti Mohd Kamil  
Ph.D (Civil Engineering) (UTM), MEng. (Environmental Management) (UTM), BEng. (Civil) (UTM)
Dr. Nor Hayati binti Abd Ghafar  
Ph.D (Civil Engineering) (Univ. Of Canterbury), MEng. (Civil-Structure) (UTM), BSc. (Structural Engineering) (UKM)

Dr. Nor Hazurina Othman  
PhD (Construction Technology)(USM), MEng (Structure)(UTM), BEng (Civil)(UTM)

Dr. Norfaniza binti Mokhtar  
Ph.D (Civil Engineering) (USM), MEng (Civil) (UTHM), BEng. (Civil) (UTM)

Dr. Noor Azlina binti Abdul Hamid  
Ph.D (Civil Engineering)(UTM), MEng. (Civil-Structural) (UTM), BEng. (Civil) (UTM)

Dr. Noorwirdawati binti Ali  
Ph.D (Civil Engineering) (UTHM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTHM)

Dr. Nur Adila binti Ab. Aziz  
PhD (Enviromental Eng.)(RMIT), MSc. (Civil and Environmental Eng.) (UTHM), BSc. (Civil Eng.) (UTHM)

Dr. Nur Shaylinda binti Mohd Zin  
Ph.D (Water & Waste Water Eng.) (USM), (Environmental Management) (UTM), BEng. (Civil) (UiTM), Dip. (Civil Eng.) (UiTM)

Dr. Nurazuwa binti Md Noor  
Ph.D (Concrete Eng.)(Kyushu Univ.),MSc. (Structural Engineering and Construction) (UPM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTM), Cert. (Civil Engineering-Construction) (PKB)

Dr. Nursitihazlin binti Ahmad Termida  
PhD (Transportation Science Eng.), MEng. (Highway & Transportation) (UPM), BEng. (Civil) (UTHM)

Dr. Nurul Hidayah binti Mohd Kamaruddin  
Ph.D (Civil) (UTM), MEng (Civil) (UTHM), BEng. (Civil) (UTHM), Dip. Ed. (Civil Engineering) (UTHM)

Dr. Sallehuddin Shah bin Ayop  
Ph.D (Civil Eng.)(Heriot-Watt Univ.),MEng. (Civil-Structure) (UTM), BEng. (Civil) (UTM)

Dr. Sharifah Salwa binti Mohd Zuki  
PhD (Structural Eng.)(USM),BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTM)

Dr. Siti Nazahiyyah binti Rahmat  
Ph.D (Civil Engineering) (RMIT UNIVERSITY), MEng. (Hydrology and Water Resources) (UTM), BEng. (Civil) (UTM), Dip. (Civil Eng.) (UTM)

Dr. Siti Radziah binti Abdullah  
PhD (Structure & Material)(Monash Univ.), BEng. (Hons.) (Civil) (KUITTHO), Dip. Ed. (Civil Engineering) (UTM)

Ir. Mustafa Kamal bin Shamsudin  
MEng. (Geotechnics) (UTM), BEng. (Civil) (UTM)

Ir. Mohammad Soffi bin Md Noh  
MEng (Structural)(UPM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTM)

Sr. Khairul Nizam bin Mohd Yunus  
MEng. (Civil-Transportation & Highway) (UTM), Bachelor in Land Surveying (UTM), Dip. (Survey Science & Geomatic) (UiTM)

Sr. Saifulizzan bin Mohd Bukari  
MSc. (Land Surveying) (UTM), BSc. (Land Surveying) (UTM), Dip. (Land Surveying) (PUO)
Ts. Ahmad Raqib bin Ab Ghani
MSc. (Highway and Transport Engineering) (USM), BEng. (Hons.) (Civil Engineering) (USM)

Ts. Mohd Fairus bin Yusof
MEng. (Geotechnics) (UTM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTM)

Ts. Rosnawati binti Buhari
MEng. (Civil) (UTM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTM)

Mr. Ahmad Fahmy bin Kamarudin
MEng. (Civil & Structural)(UiTM), BEng. (Hons.) (Civil) (UTHM)

Mr. Koh Heng Boon
MEng. (Structure) (UTM), BEng. (Hons.) (Civil) (UTM), Dip. (Civil Engineering) (UTM)

Mr. Mohd Baharudin bin Ridzuan
MEng. (Civil) (UTHM), BEng. (Civil-Structure) (UKM)

Mr. Mohd Khairy bin Burhanudin
MEng (Civil) (UTHM), BEng. (Civil) (UTHM)

Mr. Mohammad Nasir bin Mohamad Taher
MEng (Civil) (UTHM), BEng. (Hons.) (Civil) (UTHM)

Mr. Wan Afnizan bin Wan Mohamed @ Wan Abd Ghani
MSc. (Water Engineering) (UPM), BEng. (Hons.) (Civil) (UTM), Dip. (Civil Eng.) (UTM)

Mdm. Norhafizah binti Salleh
MEng. (Civil)(UiTM), BEng. (Civil-Timber Technology) (UTM)

Mdm. Noor Aliza binti Ahmad
MSc. (Water Engineering) (UPM), BEng. (Civil) (UTM), Dip. (Civil Eng.) (ITM)

Mdm. Noorliyana binti Omar
MEng. (Highway & Traffic) (UTM), BEng. (Civil) (UTM), Dip. (Civil Engineering) (UTM)

Mdm. Tuan Norhayati binti Tuan Chik
MEng (Structural)(UTM),BEng. (Civil) (UTM)

Mdm. Zaihasra binti Abu Talib
MEng. (Geotechnics) (UTM), BEng. (Civil) (UNIMAS)

Mdm. Zalipah binti Jamellodin
MEng. (Civil-Structure) (UTM), BEng. (Civil) (UTM)

Mdm. Zarina binti Md Ali
MSc. (Water Resources Eng.) (UPM), BEng. (Agriculture) (UPM)

Mdm. Salina binti Sani
Dip. (Building Services) (POLISAS)
Department of Architecture

Academic Staff

Dr. Izudinshah bin Abd Wahab
PhD (Civil Eng.) (UTHM), MSc. (Landscape Architecture) (USM), Bachelor of Architecture (USM), BSc. (Housing, Building & Planning) (USM)

Head of Department

Professor Dr. Ismail bin Abdul Rahman
PhD (Civil Eng.) (Univ. of Manchester), MSc. (Building Services Eng.) (Heriot-Watt Univ., Edinburgh), BEng. (Hons.) (Civil) (UTM), Dip. (Civil Eng.) (UTM)

Associate Professor Ir. Ts. Dr. Riduan Yunus
PhD (Construction & Project Mgmt.) (Queensland Univ. of Tech.), MEng (Construction Mgmt.) (UTM), BEng (Civil)

Associate Professor Ts. Dr. Ab Halid Abdullah
PhD (Construction & Building Eng.) (Univ. Liverpool), MEng (Construction Mgmt.) (USM), BEng (Civil)

Associate Professor Ts. Dr. Lokman Hakim bin Ismail
PhD (Construction & Building Eng.) (Univ. Liverpool), MEng (Construction Mgmt.) (USM), BEng (Civil)

Associate Professor Dr. Noor Yasmin binti Zainun
PhD (Civil and Building Eng.) (Loughborough Univ., UK), MEng. (Civil-Construction Management) (UTM), BEng. (UTM), ADP3 (ITM)

Associate Professor Dr. Hj. Zainal Abidin bin Akasah
Ph.D (Architecture) (UTM), MSc. (Building Technology) (USM), Bachelor (Technology & Education in Civil Eng.) (UTM), Dip. (Architecture) (UTM), Cert. (Civil Eng.) (PUO)

Ts. Dr. Azeanita binti Suratkon
Ph.D (Construction Management) (Chiba University) (Japan), MSc. (Construction Management-Project Management) (Heriot-Watt Univ., UK), BSc. (Building) (UTM), Dip. (Quantity Surveying) (UTM)

Ts. Dr. Hanita binti Yusof
PhD (Architecture) (UTM), Master of Architecture (Architectural Computing) (Univ. New South Wales), Bachelor (Landscape Architecture) (UTM), Dip. (Architecture) (UTM)

Ts. Dr. Muhammad Fikri bin Hasmori
Ph.D (Project Management) (USM), MEng. (Project Management) (USM), BEng. (Housing, Building dan Planing) (USM)

Ts. Dr. Nor Haslinda binti Abas
Ph.D (Property, Constrt & Project Mgmt) (RMIT), MEng. (Civil & Structure) (UTM), BEng. (Civil) (UTHM)

Ts. Dr. Noor Dina binti Md. Amin
Ph.D (Tech& Vocational Edu.) (UTHM), MSc. (Landscape Architecture) (USM), BSc. (Hons.) (Housing, Building & Planning) (Architecture) (USM)

Ts. Dr. Raﬁkullah Deraman
PhD (IT in Construction) (UM), Master in Building Technology (USM), Bachelor of Quantity Surveying (UTM), Dip. (Quantity Surveying) (UTM)
Ts. Dr. Sasitharan Nagapan
PhD (Civil Eng.) (UTHM), MSc (Technic & Vocational) (KUITTHO), BEng (Civil Eng.) (KUITTHO)

Dr. Ahmed Mokhtar Albshir Budiea
PhD (Civil) (UTM), Master of Civil Eng. (UTM), BEng (Civil) (Al-Fateh Univ.)

Dr. Emelya Murniawaty binti Samsudin
PhD (Civil Eng.) (UTHM), MSc. (Integrated Construction Project Management) (UiTM), BEng. (Civil) (UTHM)

Dr. Junaidah binti Jalani
PhD (Arch. & Building) (Deakin Univ.), MSc. (Building Technology) (USM), BEng. (Civil) (UiTM), Dip. (Civil Engineering) (UiTM)

Dr. Mohd Azuan bin Zakaria
PhD (Civil Eng.) (Hiroshima Univ.), MEng (Civil) (UTHM), BEng. (Civil) (UTHM)

Dr. Siti Hidayah Abu Talib
PhD (Civil) (USM), MEng (Civil) (USM), BEng (Civil) (USM)

Dr. Sushilawati binti Ismail
Ph.D (Construction) (QUT, Australia), BEng. (Civil Engineering) (UTM), Dip. (Civil Engineering) (UTM)

Dr. Tong Yean Ghing
Ph.D (Civil Engineering) (Hong Kong Poly Univ), BEng. (Civil Engineering) (UTHM)

Ir Mohd Norazam Bin Yasin
MEng. (Civil Engineering) (UTHM), MEng. (Civil Engineering) (Coventry Univ.), Dip. (Civil Engineering) (PKB), Dip. (Civil Engineering) (PKB)

Ts. Hasniza binti Abu Bakar
MEng. (Civil) (UTHM), BEng. (Hons.) (Civil Engineering) (UTHM), Dip. (Civil Engineering) (UTHM)

Ar. Hazri Abdul Aziz
Dip. (Architecture)(Univ. of Brighton), Dip. (Architecture)(UTM)

Ts. Syed Burhanuddin Hilmi bin Syed Mohamad
MSc. (Structural Engineering & Construction) (UPM), BSc. (Building) (UTM), Dip. (Quantity Surveying) (UTM)

Mr. Isham bin Ismail
MEng (Civil) (UTHM), BEng. (Civil) (UTHM), Dip. (Civil Engineering) (UTHM)

Mr. Muhamad Hanafi Bin Rahmat
Master of Architecture (Univ. New South Wales), Bachelor of Architecture (Univ. New South Wales)

Mr. Nasrul Arif Ahmad Mahmud
Master of Architecture & Planning (Deakin Univ.), Bachelor in Architecture & Planning (IIUM)

Mr. Nik Mohd Zaini bin Nik Soh
MEng. (Civil) (UTHM), BEng. (Civil) (UiTM), Dip. (Civil Engineering) (UiTM)

Mdm. Nor Azizah binti Adnan
MSc. (Construction Management) (UTM), Bachelor of Interior Architecture (UiTM), Dip. of Interior Design (UiTM)

Mdm. Noorli binti Ismail
MEng. (Civil) (UM), BEng. (Civil) (UiTM)
Mdm. Nur Amalina Hanapi  
Master of Architecture(Univ. of Newcastle), Bachelor of Architecture (IIUM)

Mdm. Nur Nasuha binti Abd Salam  
Master of Architecture (Univ. New South Wales), Bachelor of Architecture (Univ. New South Wales)

Mdm. Hannifah binti Tami  
BEng. (Civil & Structural) (UKM), Dip. (Civil Engineering) (POLISAS), Cert. (Civil-Construction) (POLISAS)

Mdm. Siti Khalijah binti Yaman  
BEng. (Civil Engineering) (UTM), Dip. (Civil Engineering) (UTM)
Technical Staff

Mr. Kasim bin Sebli
Cert. (Civil-Road and Water Works) (PUO)

Mdm. Jalilah binti Mokhtar
Dip. (Civil Engineering) (POLIMAS), Cert. (Civil Engineering-Building) (PSA)

Mdm. Norita binti Samsudin
Dip. (Civil Engineering) (PPD), Cert. (Civil Engineering) (POLISAS)

Mdm. Norkama Azura binti Dolah
Dip. (Building Services Engineering) (POLIMAS), Cert. (Building Services Engineering) (POLIMAS)

Mdm. Nurul Adila binti Jablan
Dip. (Building Services) (POLISAS), Cert. (Building Services) (POLISAS)

Nurul Farhani Md Johani
Dip. (Civil Engineering) (PMM)

Mdm. Siti Fadzilah binti Kasno
Dip. (Civil Engineering) (PPD), Cert. (Civil Engineering) (PKM)

Mr. Abdul Rahim bin Shamsudin
Cert. (Architecture) (PUO)

Mr. Afandi bin Abu Bakar
Cert. (Civil Engineering-Construction) (POLISAS)

Mr. Amran bin Abd. Rahman
Cert. (Civil Engineering) (PKM)

Mr. Azuan bin Poharan @ Bunari
Cert. (Building Services Engineering) (PSA)

Mr. Idris bin Abdul Hamid
Cert. (Vocational Studies) (Muar)

Mr. Mohd Azwan bin Busu
Cert. (Highway Engineering) (PKB)

Mr. Mohd Bahtiar bin Mohd Basri
Cert. (Civil Engineering-Construction) (POLISAS)

Mr. Mohd Ayob bin Sahlan
Cert. (Architecture) (PUO)

Mr. Osman bin Abd Rahman
Cert. (Civil Engineering-Surveying) (PUO)

Mr. Razali bin Slamat
Cert. (Quantity Surveying) (POLIMAS)

Mr. Sahidin bin Ghazali
Cert. (Land Surveying) (POLISAS)
Mr. Sariman bin Ahmad  
Cert. (Civil Engineering) (PUO)

Mr. Suhaimi bin Harun  
Cert. (Civil Engineering-Road and Water Works) (PKB)

Mr. Shaiful Hisham bin Saaban  
STPM (Dato Menteri Air Hitam, Batu Pahat)

Mdm. Asmah bin Ibrahim  
Cert. (Civil Engineering-Construction) (POLISAS)

Mdm. Hazliana binti Padalilah  
Cert. (Civil Engineering) (PKM)

Mdm. Roslina binti Jamil  
Cert. (Civil Engineering-Construction) (PSA)

Mdm. Sharifah Zuhriah binti Syed Fadzil  
Cert. (Civil Engineering-Construction) (POLIMAS)

Mdm. Zamra binti Jasman  
Cert. (Civil Engineering) (PUO)
Programme Name

Bachelor of Civil Engineering with Honours

Programme Aims

The aim of the Bachelor of Civil Engineering with Honours is to ensure that graduates will have fundamental civil engineering knowledge, complex problem solving skills, and team working skills in order to be employed by various organizations, including governmental agencies, consulting/design firms, construction firms, laboratories, developer and higher institutions.

Programme Educational Objectives (PEO)

These are the PEOs for Bachelor of Civil Engineering with Honours:

<table>
<thead>
<tr>
<th>No</th>
<th>PEO Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEO 1</td>
<td>Knowledgeable and technically competent in civil engineering discipline in-line with the industry requirement.</td>
</tr>
<tr>
<td>PEO 2</td>
<td>Effective in communication and demonstrate good leadership quality in an organization.</td>
</tr>
<tr>
<td>PEO 3</td>
<td>Capable to solve civil engineering problems innovatively, creatively and ethically through sustainable approach.</td>
</tr>
<tr>
<td>PEO 4</td>
<td>Able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for successful career advancement.</td>
</tr>
</tbody>
</table>

Programme Learning Outcomes (PLO)

These are the PLOs for Bachelor of Civil Engineering with Honours:

<table>
<thead>
<tr>
<th>PEO</th>
<th>Key Idea</th>
<th>Description</th>
<th>Primary domain type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Engineering Knowledge (K)</td>
<td>Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to the solution of complex civil engineering problems.</td>
<td>Cognitive</td>
</tr>
<tr>
<td>2.</td>
<td>Practical / Technical Skills/ Modern Tool Usage (PS)</td>
<td>Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex civil engineering activities, with an understanding of the limitations.</td>
<td>Psychomotor</td>
</tr>
<tr>
<td>3.</td>
<td>Communication Skills (CS)</td>
<td>Communicate effectively on complex civil 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.</td>
<td>Affective</td>
</tr>
<tr>
<td>4.</td>
<td>Critical Thinking and Problem Solving / Investigation (CTPS)</td>
<td>Conduct investigation into complex problems using research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.</td>
<td>Cognitive</td>
</tr>
<tr>
<td>5.</td>
<td>Individual and Team Work (TW)</td>
<td>Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings</td>
<td>Psychomotor</td>
</tr>
<tr>
<td>PEO</td>
<td>Key Idea</td>
<td>Description</td>
<td>Primary domain type</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>6.</td>
<td><strong>Life Long Learning (LL)</strong></td>
<td>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.</td>
<td>Affective</td>
</tr>
<tr>
<td>7.</td>
<td><strong>Entrepreneurship Skills (ES)</strong></td>
<td>Self motivate and enhance entrepreneurship skills for career development</td>
<td>Psychomotor</td>
</tr>
<tr>
<td>8.</td>
<td><strong>Ethics and Professionalism Values (ET)</strong></td>
<td>Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.</td>
<td>Affective</td>
</tr>
<tr>
<td>9.</td>
<td><strong>Leadership Skills / Project Management and Finance (LS)</strong></td>
<td>Demonstrate knowledge and understanding of engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.</td>
<td>Psychomotor</td>
</tr>
<tr>
<td>10.</td>
<td><strong>Design / Development of Solutions (DDS)</strong></td>
<td>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.</td>
<td>Cognitive</td>
</tr>
<tr>
<td>11.</td>
<td><strong>Problem Analysis (PA)</strong></td>
<td>Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.</td>
<td>Cognitive</td>
</tr>
<tr>
<td>12.</td>
<td><strong>Environment and Sustainability (ESus)</strong></td>
<td>Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts.</td>
<td>Affective</td>
</tr>
<tr>
<td>13.</td>
<td><strong>The Engineer and Society (ESoc)</strong></td>
<td>Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.</td>
<td>Affective</td>
</tr>
</tbody>
</table>
### Curriculum

Table 1. Summary of curriculum for Bachelor of Civil Engineering with Honours (BFF)

<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Course Code</th>
<th>Courses</th>
<th>Credit</th>
<th>Total</th>
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<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>UHB 10100</td>
<td>English for Higher Education</td>
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<tr>
<td></td>
<td></td>
<td>UQU 1xxx3</td>
<td>* Philosophy and Current Issues /</td>
<td>3/2</td>
<td>16/15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UQU 10303</td>
<td>** Malaysian Studies and Culture</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UQU 1***2</td>
<td>* Appreciation for Ethics and Civilisation /</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UWB 1xxx2</td>
<td>** Malay Language</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UQI 10102</td>
<td>* Islamic Studies /</td>
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<tr>
<td></td>
<td></td>
<td>UQI 10202</td>
<td>Moral Studies /</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>UQI 10902</td>
<td>** Islam in Malaysia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UQI 1***2</td>
<td>* Appreciation for Ethics and Civilisation /</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UQI 11102</td>
<td>** Civilizational Studies in Asia</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>UQ* 1xxx1</td>
<td>Co-Curriculum I</td>
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<tr>
<td></td>
<td></td>
<td>BFC 10502</td>
<td>* Civil Engineering Materials /</td>
<td>2</td>
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<td></td>
<td>UQ* 1xxx2</td>
<td>Foreign Language</td>
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<tr>
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<td>Civil Engineering Mathematic I</td>
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Total Credit: 136
Table 2. List of elective courses in Bachelor of Civil Engineering with Honours (BFF)

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SYNOPSIS OF UNIVERSITY COURSES

**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 opportunities 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 opportunities 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**

**UHB 20102 Essential Academic English**

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**

**UHB 30102 English For Technical Purposes**

**Synopsis**
This course aims to prepare students with the skills to write 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 before an audience or a panel examiner.

References

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

UQU 1xxx3 Philosophy and Current Issues

Synopsis

References

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

UQU 1xxx2 Appreciation for Ethics and Civilisation

Synopsis

References

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

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

**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**

**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.

**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**

**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

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

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

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

**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**

**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**

**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**
SYNOPSIS OF FACULTY CIVIL AND ENVIRONMENTAL ENGINEERING CORE COURSES

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

BFC 13903 Civil Engineering Mathematics I

Synopsis
This course covers basic engineering mathematics: functions, limit and continuity; Differentiation: derivative of single variable functions, chain rule, L'Hopital rule and extremum value problem; Integration: integration as antiderivative, techniques of integration and the applications.

References

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:
**BFC 10202 Nature Conservation**

**Synopsis**
This course introduces the student to establish the knowledge and understanding on includes natural environment, impacts of human activities on the natural environment, the need to maintain a good natural environment, conservation: principles and practice and responsibility in maintaining environment.

**References**

**BFC 10303 Engineering Drawing and CAD**

**Synopsis**
This course introduces students to use both manual and AutoCAD in producing Civil Engineering Drawing. The aim is to impart technical drawing skills and apply the acquired knowledge and understanding in carrying out civil and structural engineering detail drawings as well as an initial technical drawing works using AutoCAD Software. Scope of study includes Geometric Construction, Introduction to AutoCAD Level 1 and CAD application in Civil and Structural Engineering Drawing.

**References**
**BFC 10403 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**

**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. XX(125852.1)
7. Street, Robert L. Watters, Gary Z. Vennard, John K; Elementary fluid mechanics; John Willey & Son, 1996. QA901 .V45 1996 N2

**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 creative problems solving (CPS) and making decisions in the future. In this course, students will be exposed to various creative thinking and problem solving techniques, creative and innovative skills.

References

BFC 24103 Civil Engineering Mathematics III
Pre-requisite: BFC13903 Civil Engineering Mathematics I

Synopsis
This course introduces the function of several variables, which covers function, limit and continuity, partial derivative; multiple integral, line integral and surface integral; vector valued function, directional derivative, gradient, divergence, curl and implicit derivative; Green Theorem, Stokes Theorem and Gauss Theorem.

References

BFC 20703 Engineering Geomatic

Synopsis
Surveying or geomatic is important knowledge since their early civilization. In early geometric 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
**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 C++ 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**

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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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**BFC 24203 Civil Engineering Mathematics IV**  
*(Pre-requisite: BFC13903 Civil Engineering Mathematics I)*

**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**
**BFC 21002 Construction Engineering**

**Synopsis**
The construction industry is continually adopting new and improves technologies for increasing productivity and quality to meet present and future needs of human kind. Construction engineering addresses the needs of improving the technology through application of fundamental of science and engineering. This course introduces students to identify various types of construction components, issues and method to lay a solid foundation in all areas of construction engineering. Scopes of study are building sub-structure, super structure, formwork, handling concrete and utilities scope of works.

**References**

**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**

**BFC 21201 Hydraulics And Mechanics Of Material Laboratory**

**Synopsis**
The application of hydraulic and mechanics of material testing in civil engineering is applied in this course to help the student in making a clear understanding of the relationship between theory and experimental findings. Hydraulics testing consists of four (4) tests which include basic hydrology, infiltration rate, flow in open channel, and Pelton and Francis turbines. Material mechanics testing consists of five (5) tests which include shear force and shear stress in beam, bending moment and bending stress in beam, span deflection, engineering properties of tension member and buckling of compression member.

**References**

**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 apply 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**

5. Terry R. West; Geology Applied to Engineering; Waveland Pr Inc; 2010 (TA705 .W47 1995 N1).

**BFC 21403 Structural Analysis**

*(Pre-requisite: BFC20903 Mechanics of Materials)*

**Synopsis**

Structural analysis is one of the important aspect 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, columns and frames. Scope of the study includes deformable of statically determinate and indeterminate structure, influence line, plastic analysis and elastic instability.

**References**

5. A. Ghali, A. M. Neville and T. G. Brown; Structural Analysis: A Unified Classical And Matrix Approach; Spon; 2009. 1000231126
**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**

**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 and setting out.

**References**

**BFC 34303 Civil Engineering Statistics**
(Pre-requisite: BFC13903 Civil Engineering Mathematics I)

**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**
BFC 31602 Contract and Estimation

Synopsis
Understanding in construction and contract laws and contract administration procedures in building construction is essential in order 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; introduction to 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 price rate calculation.

References

BFC 33802 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 focusing in design of geotechnical structure. Student also can analyze problem occur in soil and proposed solution for each problem. The scopes of this course are fundamental properties, flow in soil, stress in soil, slope stability and consolidation & settlement.

References
BFC 31802 Highway Engineering

Synopsis
This course is intended for undergraduate students in civil engineering. The course will provide 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

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

BFC 34702 Structural Design
(Pre-requisite: BFC 21403 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

BFC 34502 Entrepreneurship

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

References

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, and intersection design.

References

BFC 32403 Environmental Engineering

Synopsis
This course introduces students to establish the knowledge and understanding on the environmental engineering particularly on water, wastewater, solid and schedule waste, air and noise. The water quality discusses the physical, chemical and biology parameters. The treatments for surface and wastewater limited on the typical methods. The solid and scheduled waste covers the management and the disposal method. The air and noise pollution describe more on construction industry.
References


BFC 32501 Transportation and Environmental Engineering Laboratory

Synopsis
This Transportation and Environmental Engineering Laboratory course is intended for undergraduate students in civil engineering. The course will provide an essential engineering knowledge and methods in transportation and environmental engineering which covering the entire necessary fundamental needed for practitioners at the entry level to industry. This course introduces students to application of transportation and environmental engineering as part of civil engineering design, construction and maintenance works. In line with its main task, this course conducts experiments on Spot Speed Study, Signalised Intersection Capacity Analysis, Penetration and Softening Point Test of Bitumen, Flakiness and Elongation Index of Aggregate, Aggregate Impact Value, and California Bering Ratio Test (CBR) for transportation engineering laboratory. In addition, this course implements open ended laboratory for traffic- and highway-related studies. Whereas, for environmental engineering laboratory, this course conducts a case studies based on the Water Quality Index (WQI) which includes testing of pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Suspended Solids (TSS) and Ammonia Nitrogen (AN). In addition, the course also emphasizes sampling and sample preservation methods.

References

**BFC 32602 Mechanical and Electrical System**

**Synopsis**
Mechanical and electrical system is the engineering of the internal environment and its impact on a building. It essentially brings buildings and structures to life. This course introduces students to design, installation, operation and monitoring of the mechanical, electrical and public health systems required for the safe, comfortable and environmentally friendly operation of modern buildings. Scope of study includes scope and impact of M&E, fundamental of building physic, ventilation, fire safety, electrical and water supply.

**References**

**BFC 32703 Sustainable Construction Management**

**Synopsis**
The construction industry is regarded as an essential and highly visible contributor to the process of growth of one country. Nevertheless, the adverse impacts to the environment lead to a growing realization and acceptance throughout the world that there is a need for a more responsible approach to the environment. This course introduces students to overall planning, co-ordination and control of a project from inception to completion aimed at meeting a client’s requirements in order to produce a functionally and financially viable project that will be completed on time within authorized cost and to the required quality and environmental standards. Scope of study includes sustainable construction management, sustainable construction technical guidelines, sustainable building management, management concept, project organization, planning and scheduling project, project time control, project cost system, project cost control, sources management and risk management.

**References**

**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**
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, 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 of Penman and Thornthwaite, infiltration capacity, factors of infiltration i.e. infiltration index; Characteristics and Modelling of Surface Runoff: catchment area, catchment characteristics, river flow determination, intensity-duration-frequency curve, runoff determination, peak flow estimation; Analysis of Hydrograph: runoff components, hydrograph separation, unit hydrograph, application of unit hydrograph; Flood Control: flood and river control, flood frequency analysis, level-pool routing; Groundwater: introduction, one-dimensional groundwater steady flow, well hydraulic.

References

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.
**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**

**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**

**BFC 43201 Civil Engineering Software**

**Synopsis**  
The civil engineering software such Esteem, Staad-Pro and Primavera 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: primavera project planner, Sdr Mapping and Road Design Software, Geotechnical Engineering Software: Geo Slope & Plaxis.
References
2. Construction Scheduling with Promavera Enterprise; Marchman and Anderson; Clifton Park, NY, 2003; TH438.4M37 2003
6. Road Geometric Design Software User Guide;
7. WASDA Software User Guide;

**BFC 32202 Engineer and Society**

**Synopsis**
Engineers work to develop economic and safe 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 the importance of engineer in society and role of engineer in different sector. The scope of the course are introduction to engineer & society, engineering and organisation, relationship of humanisation in engineering management, research and development, engineer and private sector and professional talk.

**References**

**BFC 43502 Occupational Safety and Health**

**Synopsis**
This course introduces students to knowledge and skills in occupational safety and health in workplace. Scopes of the study include: Health and Safety Management- OSHA 1994 (Act 514), construction regulation, safety and health management, and safety and health culture; Risk assessment- legal aspect of risk assessment, and risk assessment process; Safety hazards and controls- slips, trips, and falls, caught-in or –between objects, struck by objects, fire and explosions, transportation and vehicle related accidents, confined space, electrical hazards and mechanical handling; Health hazards- chemical hazards, physical hazards, biological hazards, and ergonomics and repetitive strain injuries; and Incident/Accident investigation and reporting- accident causation models, incident investigations, incident analysis and data collection, and incident reporting.

**References**
**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 and Environmental Engineering, Universiti Tun Hussein Onn Malaysia, 2013.
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 and Environmental Engineering, Universiti Tun Hussein Onn Malaysia, 2013.
3. Donald H McBurney and Theresa L. White, Research Methods, Thomson Learning, 2007

BFC 43303 Integrated Design Project

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.

BFA 40103 Environmental Management
(Pre-requisite: Completed 96 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

BFA 40203 Design of Water supply
(Pre-requisite: Completed 96 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

BFA 40303 Solid and Hazardous Waste Management
(Pre-requisite: Completed 96 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

BFA 40403 Design of Waste Water Engineering
(Pre-requisite: Completed 96 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

BFB 40203 Tall Building Construction
(Pre-requisite: Completed 96 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

BFB40603 Building Services I
(Pre-requisite: Completed 96 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

BFB 40703 Building Services II
(Pre-requisite: Completed 96 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

BFB 40903 Building Maintenance
(Pre-requisite: Completed 96 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

BFG 40103 Advanced Foundation Engineering
(Pre-requisite: Completed 96 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
**BFG 40203 Advanced Geotechnical**  
*(Pre-requisite: Completed 96 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**

**BFG 40303 Geo-Environment**  
*(Pre-requisite: Completed 96 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**

**BFG 40403 Geosynthetics Design**  
*(Pre-requisite: Completed 96 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

BFG 40503 Engineering Geophysics  
(Pre-requisite: Completed 96 Credit Hours)  

Synopsis
Engineering geophysics is a course for introducing the geophysical 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 electromagnatic 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

BFG 40603 Soft Soil Engineering  
(Pre-requisite: Completed 96 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 straightforward 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 geotchnical 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

**BFG 40703 Applied Geomatics**
*(Pre-requisite: Completed 96 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**


**BFG 40803 Geographical Information Systems For Civil Engineering**
*(Pre-requisite: Completed 96 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**

### BFP 40103 Construction Planning And Scheduling
(Pre-requisite: Completed 96 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**

### BFP 40203 Construction Machinery And Equipment Management
(Pre-requisite: Completed 96 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**

### BFP 40603 Industrialized Building System
(Pre-requisite: Completed 96 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 :
4. Taylor and Francis; 2008; Call Number : TA439 .L48 2008
5. Gibb, Alistair G. F.; Off-site fabrication : prefabrication, pre-assembly and modularization; Latheronwheel : Whittles; 1999; Call Number : TH1098 .G52 1999
7. Minguet, Josep Maria; Contemporary green prefab: industrialized & kit architecture; Singapore; Page One Pub.; 2012; Call Number : NA7145 .C66 2012
8. Staib, Gerald; Components and systems modular construction : design structure new technologies; Basel : Birkhauser, 2008; Call Number : TH1098 .S72 2008

BFS 40103 Advanced Structure Analysis
(Pre-requisite: Completed 96 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

BFS 40303 Prestressed Concrete Design
(Pre-requisite: Completed 96 Credit Hours)

Synopsis
Concrete construction method has evolved throughout the history of mankind. Many methods were discovered according 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.

65
References
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)

Synopsis
Concrete is the most widely used composite material in the construction industry. This course exposes students 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
4. (TA 403. Z42 2011)
7. ACI Design Handbook (Metric), American Concrete Institute, 2010 (130728.1)
9. Concrete repair manual: two volume set Edition:3rd ed. American Concrete Institute, 2008 (128804.1)

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
5. Dennis Lam, Thien-Cheong Ang and Sing-Ping Chiew; Structural Steelwork Design To Limit State Theory; Elsevier Butterworth Heinemann; 3rd edition; 2004. TA684. L35 2004
BFS 41003 Finite Element Analysis  
(Pre-requisite: Completed 96 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**

BFK40303 Advanced Timber Structural Design  
(Pre-requisite: Completed 96 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. MS 544: 2001; Code of Practice For Structural Use of Timber; SIRIM, Malaysia
3. MS 1553: 2002, Code of Practice on Wind Loading for Building Structure; SIRIM, Malaysia

BFW 40103 Water Resources Engineering  
(Pre-requisite: Completed 96 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

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

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
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

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

BFW 40603 Sediment Transport
(Pre-requisite: Completed 96 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

BFT 40203 Pavement Engineering
(Pre-requisite: Completed 96 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

**BFT 40303 Transportation Engineering**
*(Pre-requisite: Completed 96 Credit Hours)*

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**

**BFT 40503 Advanced Traffic Engineering**
*(Pre-requisite: Completed 96 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**

**BFT 40603 Road Safety Engineering**
*(Pre-requisite: Completed 96 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, countermeasures 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**

5. NCHRP Research Results Digest 220, Transportation Research Board; Strategies for Improving Roadside Safety, 1997.
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 the 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.

Further Education Pathway:
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<thead>
<tr>
<th>MOF Levels</th>
<th>Skills</th>
<th>Vocational and Technical</th>
<th>Higher Education</th>
<th>Lifelong Learning</th>
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</thead>
<tbody>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>Doctoral Degree</td>
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Source: Malaysian Qualification Framework