STUDENT HANDBOOK



Dean's Foreword



The Faculty of Civil Engineering Universiti Teknologi MARA is very committed in offering progressive programmes tailored to the needs of the stakeholders, to achieve our objective to produce wholesome nation builders. The programmes offered at the faculty emphasise on a broad exposure of knowledge with industrial practices and observation which prepare students to be competent, effective and ethical in their future engineering endeavours. These are reflected by the attainment and assessment that were made through OBE measurement. This handbook will aid the students to know the faculty better, so as to be more well-prepared in their journey to reach a greater height in life.

Dean, Prof Dr. Zakiah Ahmad

Preface

The objective of this student handbook is to disseminate to students, information on civil engineering programmes currently offered at the Faculty of Civil Engineering, Universiti Teknologi MARA Shah Alam. The Student Handbook provides documents on important academic and faculty matters that include faculty members, programme structures, curriculum and course synopsis. Information will be updated from time to time. It is hoped that the students will be more well-informed and make the best of their life-experience in this faculty.

Deputy Dean (Academic) Assoc. Prof. Dr Wardah Tahi



FACULTY OF CIVIL ENGINEERING VISION AND MISSION



Vision

To establish Faculty of Civil Engineering as a premier faculty of outstanding scholarship and academic excellence capable of providing leadership to Bumiputera's dynamic involvement in civil engineering fields of world-class standards in order to bring forth globally competitive graduates of sound ethical standing.

Mission

To enhance the knowledge and expertise of Bumiputera in the field of Civil Engineering through professional programs, research work and community service based on moral values and professional ethics.

INTRODUCTION

The Faculty of Civil Engineering of Universiti Teknologi MARA (UiTM) has been in existence for almost 50 years. Previously, intakes of students into Diploma and Bachelor degree programmes have been on an increasing trend. Diploma programmes are also conducted at UiTM branch campuses in Johor, Pahang, Sarawak and Penang. The programmes at the branch campuses operate independently utilizing academic staff and facilities of their own.

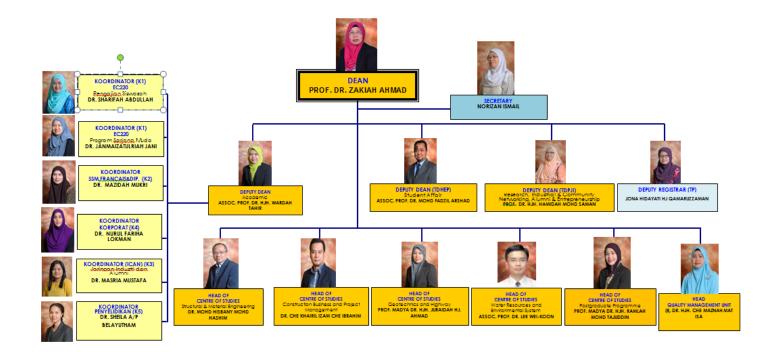
Over the years, the curriculum and syllabus have been reviewed periodically to prepare and impart to the studies the current state-of-the-art knowledge and skills to meet the current and future challenges of the working environment. The laboratories are also continuously upgraded with better equipment and systems.

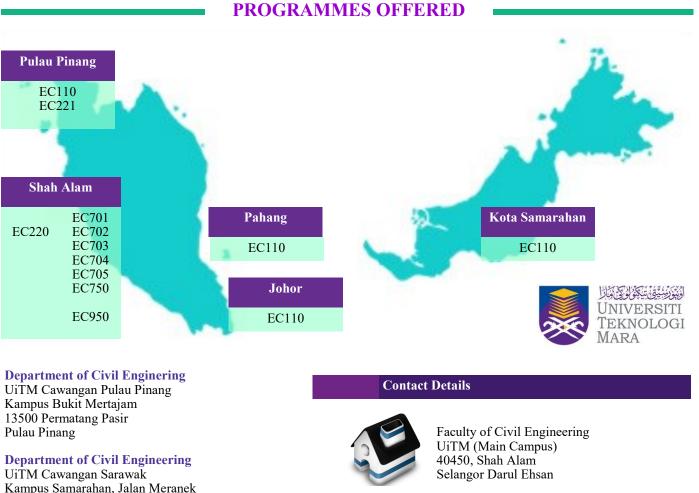
The bachelor degree and diploma programmes are offered on a full-time and part-time basis. The full -time and part-time programmes adopt the same curriculum and utilize the same faculty resources. The full-time degree is a four years programme, whiles the part-time degree is a five years programme.

The Faculty of Civil Engineering also offers post graduate programmes at doctorate level and at master's level by research and coursework. The areas of specialisation currently available for post graduate studies are Geotechnical Engineering, Structural Engineering, Water Resources Engineering, Environmental Engineering, Construction Management and Highway Engineering.

Faculty of Civil Engineering Organization Chart







UiTM Cawangan Sarawak Kampus Samarahan, Jalan Meranek 94300 Kota Samarahan Sarawak

Department of Civil Engineering

UiTM Cawangan Pahang Kampus Jengka 26400 Bandar Jengka Pahang



+603-55435263 +603-55435275



http://fka.uitm.edu.my

	Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
1	Abdul Samad Abdul Rahman	Msia Skills Certificate.UTM/KuiTTHo (1997) Dip in Education UTM/KuiTTHO (1999) B.Eng Civil Eng. UTM/KuiTTHO (1997) MSc Civil Eng UiTM (2008)
2	Adiza Jamadin	M.Sc in Civil Eng (Structure) UiTM (2008) B.Sc in Civil Eng. (Const.Mgt) UTM (2001)
3	Ahmad Kamil Arshad (Prof. Madya) (Ir) (Dr)	Bachelor of Eng. (Civil) Curtin Univ. of Rech. Westem, Australia (1987) GradDipBusFinance WACAE (1989) MSc (Highway & Trans. eng). Univ. Putra M`sia (2003) Master in Buss. Adm. Deakin Univ. APESMA, Australia (1994) Doctor of Philosophy (Civil Eng) UiTM (2009)
4	Ahmad Ruslan Mohd Ridzuan (Prof. Madya) (Dr)	B.S.c in Civl Eng.(Glasgow)(1985) M.Civ.Eng (Structr.& Materials) (UTM)(1994), Ph.D in Civil Eng.(USM) (2004)
5	Amiruddin Mishad	Dip. Civil Eng. UiTM (1999) BSc. (Hons) Civil UiTM (2002) MSc. Civil Eng.(Struc), UiTM (2006)
6	Amnorzahira Amir (Dr)	B. Eng (Hons) Civil UPM (2003) MSc. (Civil-Env) UPM (2006) PhD (KAIST)

FACULTY MEMBERS			
	Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award	
P	Anizahyati Alisibramulisi (Dr)	MSc. in Structures (UTM) B.Eng. in Civil Eng (UiTM)	
	Aruan Efendy Mohd Ghazali (Dr)	Dip in Civil Eng. UiTM (2003) B.Eng.(Hons) Civil Eng.UiTM (2005), MSc. Civil Eng.(Structr.) UiTM (2006) PhD in Engineering, Uni of Waikato, NZ (2016)	
	Assrul Reedza Zulkifli	B. Eng (Civil) UTM (2008) Msc (Construction Management) UTM (2013)	
C	Azerai Ali Rahman	B.Eng (Hons)(Civil) UiTM (2004).M.Sc (Computational Mechanics of Materials & Structures) (Stuttgart) (Germany) (2007)	
Ø	Azianabiha A. Halip @ Khalid	Bachelor in Civil Eng. USM (2004) M.Sc in Civil Eng. (Environ Eng) USM (2005)	
	Azmi Ibrahim (Prof.) (Dr)	Dip.CE(ITM) B.Eng.(Hons)(Civil)UiTM (1986), PhD (Sussex) (1995)	
R	Balqis Md. Yunus	Diploma in Civil Eng. UiTM (2003) B. Eng (Hons) (Civil) UiTM (2005), M.Sc UiTM (Structure) (2008)	
	Basir Nordin (Ir) (Hj)	B.Eng (Hons) Civil Eng. UTM)(1989) Msc. (Structure) (UPM) (2006)	
		Name Image: Imag	

LIST OF LECTURER

	Name		Academic Qualifications/ Field of Specialization/ Institution and Year of Award
15	Che Kha Ibrah (Dr.		B.Eng. (Hons) Civil (UiTM) (2005) Msc.Civil Engineering UiTM (2007) PhD Civil Engineering Auckland (2014)
16	Che Mazı (Ir) (Dr)	nah Bt. Mat Isa (Hjh)	B.Sc(Civil)Eng.Charlotte,(USA) (1987) M.Sc in Intergrated Construction Project Mgmt(UiTM) (2000)
17	Ekarizan	Shaffie	B. Eng (Hons) (Civil) UiTM (2004) MSc in Civil Eng (Highway) (2008)
18	Fauzi Bah	narudin	B.Sc (Hons) (Civil Eng) USM, (2005) M.Sc. Civil Eng. (Water Resources) USM (2007)
19	Goh Chir	ng Hua	B.Sc(Hons) Civil Eng. Stranthclyd Univ.,Glasglow (1985), M.Sc (Structural Eng.& Construction) UPM (2002)
20		Mohd Saman .)(Dr)(Hjh)	BSCE (Civil Eng.) USA , Ph.D in Civil Eng.(Australia)(1999)
21	Haryati	i Awang (Dr)	B.Sc(Hons) UM , M.Sc (Geotech. Eng) UTM , PhD UiTM (2010)
22	Hazrina	Mansor (Dr.)	Dip in Civil Eng UiTM (2004) B.Eng in Civil Eng UiTM (2007) M.Sc in Bridge Eng UK (2008) PhD in Structural Eng UK (2014)
23	Ilyani A Abu Ba		B.Eng(Civil) USM, Msc. USM

Name		Academic Qualifications/ Field of Specialization/ Institution and Year of Award
24	Intan Rohani Endut (Dr.)	BSc in Eng. UTM (1996) Master in Project Management UiTM (2002) Phd in Project Management (Univ. Glasgow Caledonian)UK (2008)
25	Irma Noorazurah Mohamad	B.Eng in (Civil Eng) UTM, Skudai(2007) M.Eng (Civil Hydraulics & Hydrology) (2008)
26	Ismacahyadi Bagus Mohd Jais	BSc in Civil Eng (UiTM) MSc in Civil Eng (UK)
27	Jalina Kassim	B.Sc (Civil Eng Environmental Eng UTM Skudai (2006) M.Sc Civil Eng (Environmental Eng) UiTM (2008)
28	Janmaizatulriah Jani (Dr)	B.Eng (Hons) Civil UiTM (1999) M.Sc (Civil Eng) UiTM (2004) PhD (Sheffield)
29	Jazuri Abdullah (Dr.)	B.Eng (Hons) Civil (UiTM) Msc (WAREM) (Stuttgart) PhD (Civil Eng)(USA)
30	Jezan Md Diah (Dr)	BSc in Civil Eng (UiTM) MSc in Highway Eng (Stuttgart University) PhD in Civil Engineering (UiTM)
31	Junaidah Ariffin (Prof.)(Ir.)(Dr.)(Hjh.)	B.Sc(Hons) (UK) (1987), M.Sc.Eng (UM) (1996), Ph.D (USM) (2004)

	Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
32	Jurina Jaafar (Dr)	B.Eng (Civil)(Hons) UiTM (2001) M.Sc (Stuttgart, Germany) (2003) PhD (Hydrodynamic and Hydrology Engineering) UiTM (2015)
33	Juraidah Hj Ahmad (Assoc Prof) (Dr) (Hjh)	B.Eng in Civil & Structural (Hons) Eng. (1995), MSc in Geotechnical & Geological Eng. (2001) PhD in Civil Eng. (2010)
34	Kamaruzzaman Mohamad (Dr)	Dip. In Civil Eng. UiTM (1985) BSc in Civil Eng (UiTM) (1996) MSc in Geotechnical Eng (USM) (2002) PhD in Civil Eng. (UiTM) (2010)
35	Kartini Kamaruddin (Prof. Madya) (Ir) (Dr) (Hjh)	B.Eng(Hons) UiTM (1986), M.Sc (Loughborough) UK (1991) PhD in Concrete Technology (UM)
36	Lee Siong Wee (Dr)	B.Eng.UTM (2003), Msc (Civil)UTM (2005).
37	Lee Wei Koon (Dr)	B.Eng(Hons) Civil – UTM (1999), M.Sc (NTU) Singapore (2002) PhD (Oxford)
38	Masria Mustafa (Dr)	B. Eng. (Hons) (Civil Eng.) USM (2004) M.Sc.Chulalongkorn Univ. (2006) PhD(Civil Eng.) Technical Univ. of Munich (2010)

		Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
3	39	Marfiah Abd Wahid (Dr)	BSc in Civil Eng (UiTM) MSc in Civil Eng (UKM) PhD Eng. (Environmental Eng.) Kyoto University
2	40	Mazidah Mukri (Dr)	BSc in Civil Eng (UiTM) MSc in Civil Eng (UiTM) PhD (Civil & Structural Eng.) (UKM) (2011)
2	41	Mazlina Mohamad	Dip. In Civil Eng. (UiTM) B.Eng. (Hons) in Civil Eng. UiTM MSc in Civil Eng. (Structures) UiTM
2	42	Mohd Amizan Mohamed @ Arifin	Dip. In Civil Eng. UiTM (2005). Bach. Of Eng (Hons) Civil Eng. UiTM (2007), M.Sc in Civil Eng. (Construction) UiTM (2009)
2	43	Mohd Fadzil Arshad (Dr)	Dip. in Civil Eng Politeknik Ungku Omar, Ipoh (1995) B. Eng (Civil) Hons UiTM (1998) M.Sc (Civil Structure) USM (2003) PhD Structural Eng. USM (2011)
2	44	Muhamad Fuad Shukor (Ir.)	B.Eng (Hons) Civil UTM, Skudai, M.Eng(Civil. Environ.)UTM, (2008)
2	45	Muhammad Akram Adnan (Dr)	B.Eng.(Civil) (Hons) UM, MSc. (IT) UiTM PhD in Highway Eng (USM)

		Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
4	6	Muhd Salmizi Ja'afar (Ir.)	Diploma in Civil Eng.(UiTM) (1993) Advanced Dip in Civil Eng (UiTM) (1995) M.Sc (Integrated Construction Project Mgmt (UiTM) (2006)
4	7	Noor Azreena Kamaluddin	B.Sc in Civil Eng (Hons) UTM (2007) M.Sc (Civil Trans. & Highway) UTM (2008)
4	8	Noorfaizah Hamzah	Dip. In Civil Eng. UiTM (2004) B.Eng (Hons) (Civil) UiTM (2007) M.Sc (Civil) UiTM 2008
4	9	Nor Azmi Bakhary	B.Eng (Hons) (Civil) UiTM , M.Eng(Civil-Construction & Mgt) UTM (2002)
5	o	Norhayati Abd Hamid (Prof. Madya)(Dr.)(Hjh.)	B.Sc(Hons)(Civil) Pittsburgh, USA (1988) , M.Sc (Structures & Mgt.) Newcastle, UK (1992) PhD (Earthquake Engineering) Christchurch, NZ, (2007)
5	1	Nor Hazwani Md. Zain	B.Eng (Hons) Civil Eng UM (2006) M.Sc (Geotechnical Eng) UiTM (2007)
5	2	Norashikin Ahmad Kamal (Dr.)	B.Sc (Civil) of Eng (Environmental) UM (2006) M.Sc Civil Eng (Water) UiTM (2007)
5	3	Mohd Fozi Ali (Assoc) (Prof) (Dr)	Bachelor Agric Eng,UPM (1987) M.Sc Soil & Water Eng.UPM (2000) PhD Civil and Environmental Eng. Univ. of Strathclyde Glassgow (2007)

	Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
54	Mohd Hisbany Mohd Hashim (Assoc)(Prof)(Dr)	B.Sc in Civil Eng. Uni. Of Alabama USA (1992) M.Sc Civil (Structure) UTM (2005) PhD (Civil Eng) UTM (2010)
55	Mohd Jamaludin Mohd Noor (Prof. Madya) (Dr)	Bsc.Civil Eng.(Hons) (UK) (1984), Msc. (Geotechnics) (UM) (1996) PhD in Civil Eng.(Sheffield,UK) (2005)
56	Mohd Khairul Kamarudin (Dr.)	Bsc.Civil Eng.(Hons) UTM (2005), Msc. (Bridge Engineering) Surrey(2007) PhD in Structural Eng.(Surrey) 2015
57	Mohd Raizamzamani bin Md. Zain	Dip in Civil Engineering UiTM (2003) B.Eng (Hons) Civil UiTM (2006), MSc. In Civil Engineering (Structures) UiTM (2007)
58	Mohd Ridzuan Mohd Ali	Dip. In Civil Eng UiTM (2001), B.Eng (Hons) (Civil) UiTM (2004), M.Sc in Civil Eng (Structure) UiTM (2008)
59	Norazlan Khalid	B.Sc of Eng (Civil) UTM Skudai (2006) M.Sc of Eng. (Civil), UTM Skudai (2008)
60	Hjh Norbaya Sidek	Dip. In Civil Eng (Wood Based Tech) with education UiTM (1997) Bachelor of Eng (Hons) Civil UTM (2003) M.Sc Civil Eng (Geotechnique) UiTM (2009)

	Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
61	Norhafezah Kasmuri (Dr.)	B.Eng (Hons) Civil & Enviromental, UKM (2001) MSc (WAREM)(Suttgart) (2004) PhD (Chemical Engineering) (Swansea, UK) (2014)
62	Norliana bt Sulaiman	Dip in Civil Eng (UiTM) (1998), B.Eng.(Civil) UiTM (2000), MSc.(Civil) USM (2006)
63	Norliyati Mohd Amin (Dr)	BSc in Civil Eng (Japan) MSc in Civil Eng (UiTM) PhD (Japan)
64	Norrul Azmi bin Yahya (Dr)	Dip. Civil Eng (UiTM) (2003), B.Eng(Hons)UiTM(2005), M.Sc (Structures) UiTM (2007)
65	Nur Kamaliah Mustaffa	Dip. In Civil Eng UiTM (2004) B.Eng (Hons) (Civil) UiTM (2007) M.Sc (Civil) UiTM (2008)
66	Nur Syahiza Zainuddin	BA of Eng in Civil (UTM) (2006) MA of Eng (Civil) Environ. Mgmt UTM (2007)
67	Nurbaiah Mohammad Noh	Dip. In Civil Eng. UiTM (2004) B.Eng (Hons) (Civil) UiTM (2006) M.Sc Civil Eng. (Structures) UiTM (2008)
68	Nurhidayah Hamzah	B.Sc (Hons) Civil Eng UTM Skudai Johor (2006) M.Sc (Civil Eng) UTM Skudai Johor (2007)
69	Nursafarina Ahmad	Dip. In Civil Eng UiTM (2004) B.Eng (Hons) (Civil) UiTM (2007) M.Sc (Civil) (Structure) UiTM (2008)

LIST OF LECTURER

	Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
70	Nurul Fariha Lokman (Dr.)	Dip in Civil Eng (UiTM) B.Sc in Civil Engineering (UiTM) Msc of Civil Engineering (UiTM/ Nagaoka) Doctor of Philosophy in Civil Engineering (UKM)
71	Nurul Huda Suliman	B Eng (Hons) Civil UiTM (2005) MSc Civil Eng (Struc) UiTM (2007)
72	Oh Chai Lian (Ir) (Dr)	BSc In Civil Eng (UTM) M.Eng (Civil –Structural)) UTM
73	Ramlah Mohd Tajuddin (Prof. Madya) (Dr) (Hjh)	Dip in Civil Eng (UiTM) (1983), Advanced Dip (Civil Eng) UiTM (1986), M.Sc (Tropical Public Help Eng) Univerisity of Leeds UK, (1994) PhD (Eviron. Eng) UTM (2006)
74	Renga Rao Krishmoorthy (Dr)	B.Eng (Hons) (civil) (USM) M.Sc (Struct. Eng.) (USM) PhD (Struct.Fire Eng.) (UK)
75	Rohana Hassan (Assoc) (Prof)(Dr)	BSc in Civil Eng (UiTM) MSc in Civil Eng (UiTM) PhD in Civil Eng (UiTM)
76	Rozaina Ismail	Bachelor of Eng. (Civil) UTM (2006) M.Sc in Eng. (Civil & Structure) UTM Skudai (2006)
77	Shaharin Hamid (Ir)	Dip in Civil Eng. UTM (1988) B. Eng (Hons) (Civil). UTM (1991) M. Sc . Eng (Structures) UiTM (2008)

	Name	Academic Qualifications/ Field of Specialization/ Institution and Year of Award
78	Sharifah Abdullah	Dip. In Civil Eng. UTM Advanced Dip in Civil Eng. ITM MSc Civil Eng USM
79	Sheila A/P Belayutham (Dr)	B. Eng (Hons) in Civil Eng UTM Skudai, Johor. (2003) M.Sc (Construction) UTM Skudai (2004)
80	Siti Nurbaya Ab Karim (Ir) (Dr)	B. Eng. (Hons),UPM (1997) M.Sc. (Highway & Transportation Eng.) UPM (2000),
81	Siti Nurulhuda Mohd Imran	Dip.Civil Eng. (Uni.Tun Hussein Onn) (2003) Degree of Civil Eng. (Uni. Tun Hussein Onn) (2006) Master of Eng.(Civil-Environ.Mgt) (UTM) (2007)
82	Siti Rashidah Mohd Nasir (Dr)	BSc in Civil Eng (Leeds UK) (1994) MSc in Construction (Glamorgan UK) (1998) PhD in Civil Eng.(UTM) (2011)
83	Siti Zaharah Ishak (Dr)	BSc in Civil Eng (UiTM) MSc in Highway Eng (UPM) PhD in (Trans. System Eng.) (Univ. of South Australia)
84	Sulaiman Abdul Malik (Dr)	Adv Dip In Business Studies B. Eng. (Civil) (Hons) UTM(1998), MBA (Ohio University) (1994) Ph.D in Civil Eng.(UITM) (2008)

	Name	Academic Qualifications/ Field of Specialization/ Institu- tion and Year of Award
8	Hj Suhaimi Abd. Talib (Prof.) (Sr) (Ir) (Dr) (Hj)	B.Eng. Hons. Universitiy of Melbourne, Australia, M.Sc. (Water and Environmental, Loughborough University UK, Ph.D Civil Eng. (Wastewater) UTM
80	Sulaiman Hashim (Ir)	Dip. In Civil Eng. UTM (1986) Advanced Dip in Civil Eng. (1995) M.Sc Eng (Cnstrct Mgt) UiTM 2008)
8	Suzana Ramli (Dr)	A-Level (Kolej Mara Banting) (1997), B.Eng (Hons) Civil (2000), M.Sc (Water Resources Eng & Mgt) Stuttgart,Germany (2004)
88	Thevaneyan a/l Krishta @ David (Dr.)	Dip. In Education, Institute Technology Tun Hussein Onn B.Sc (Civil Eng) (Hons) UTM UTHM (1997) MSc (Structural Eng & Cons) UPM (2005) PhD (Structural Eng) (2012)
89	Wardah Tahir (Prof. Madya) (Dr).)(Hjh.)	B.Sc (AE) (Cornell) New York, USA (1990), M.Sc (Water Resources) (Birmingham) UK (1998), Ph.D in Civil Eng.(UiTM) (2008)
9(Wardati Hashim	B.Eng (Hons) in Civil, UTM M.Eng (Civil-Highway & Transport) UTM
9.	Yasmin Ashaari (Prof. Madya) (Dr.)	BE (Hons) (CE) (Wollongong, Aust) (1986) PhD (Wollongong, Aust) (1990)

	Name	Academic Qualifications/ Field of Specialization/ Institu- tion and Year of Award
92	Yazmin Sahol Hamid (Dr.)	Dip. In Civil Eng. UiTM (2004) Bachelor in Eng (Civil Eng) UiTM (2006) M.Sc in Bridge Eng Surrey,UK) (2008) PhD in Structural Eng (UK) 2015
93	Adnan Bin Derahman (Dr)	Bachelor of Engineering with Honours (Civil) UniversitiTe- knologi MARA (1998) Master of Science in Civil Engineering (Geotechnical) Uni- versitiTeknologi MARA (2008) PhD in Civil Engineering (Geotechnical) UniversitiTeknologi
94	Zinab Mohamed (Prof.) (Datin)(Ir.) (Dr.) (Hjh.)	Diploma (Civil) (UiTM) (1983) B. Eng. (Hons) (Civil Eng.) UiTM (1985) M.Sc. (NCUT,UK)(1992) PhD((UKM) (2004)
95	Zaizatul Zafflina Mohd Zaki	Dip. In Civil Eng. UiTM (2004) Bachelor in Eng (Civil Eng) UiTM (2006) M.Sc in Civil Eng (Water Resources) UiTM (2008)
96	Zakiah Ahmad (Prof. Madya) (Dr)	BSc in Civil Eng (USA) MSc in Mathematics (USA) PhD in Timber Eng. (UK)
97	Zanariah Abd. Rahman	B.Eng (Civil Eng) UTM (2004) M.Sc in Civil Eng (Trans. & Highway) UTM (2007)
98	Zulkiflee Yusof (Prof. Madya)	B.Sc Civil Eng.(Loughborough) (1984), MBA (UiTM) (1999)

Name	Position
Shu'aibi Zainal Abidin	: Assistant Registrar (Academic I)
Faridah Abdul Rahman	: Executive Officer
Noor Liza Zakaria	: Executive Officer
Nor Halizah Abd. Rahman	: Executive Officer
Khaini Hailani	: Executive Officer
Radin Mohd Hasmunizam Radin Mohd Hasnon	: Asst. Science Officer
Nor Ramliza Ramli	: Asst. Science Officer
Norizan Ismail	: Personal Assistant (Dean P.A)
Roszaimah Zainal	: Assistant Administrator
Norazura Abd Kadir	: Assistant Administrator
Noor Imaniah Sayuti	: Assistant Administrator
Hamisah Suliman	: Assistant Administrator
Rasfah Kusaini	: Assistant Administrator
Hasnah Jamil	: Assistant Administrator
Sarifah Norhayati Sarif Ali	: Assistant Administrator
Siti Nor Manal Ma'ali	: Assistant Administrator
Siti Zainun Mohamad	: Assistant Administrator
Mohd Tahmil Johar	: Assistant Administrator
Surani@Amran Salleh	: Office Boy

Name	Position
Siti Sara Binti Zakaria @ Mustafa	: Asst. Information Technology Officer
Hashim Hassan	: Super Scale Technician
Ahamad Razman Arshad	: Senior Technician
Mohd Hapiz Zakaria	: Senior Computer Technician
Aishah Idris	: Senior Technician
Burhanuddin Adnan	: Senior Laboratory Assistant
Saiful Salim	: Senior Laboratory Assistant
Muhamad Ali Miskam	: Senior Laboratory Assistant
Shahizan Pa'wan	: Computer Technician
Mohd Fazlan Yahya	: Computer Technician
Noor Hidayah Mohd Kamsani	: Computer Technician
Mohd Hairul Azhar Bin Ahmad	: Computer Technician
Mohd Azuan Azhar Md Zain	: Laboratory Assistant
Hazri Othman	: Laboratory Assistant
Masdiana Taslim	: Draught Person
Norazuan Imam Mahadi	: Auditory Store
Ahmad Afuan Ismail	: Technician
Azri Syafiq Kamarozaman	: Technician
Abd Mukmin Nasharuddin	: Technician
Mohd Akhbar Abdul Hamid	: Technician
Mohd Feiq Zafran Ahmad Jelani	: Technician
Mohd Hurman Abdul Ghani	: Technician
Mohd Shafrizat Mohd Sumali	: Technician
Mohd Shahmir Mohd Said	: Technician
Muhammad Faiz Ahmad Zait	: Technician

Name	Position
Muhamad Hazli Shariei	: Technician
Muhammad Tarmizi Ismail	: Technician
Noorul Hilmi Md. Salleh	: Technician
Muhammad Fuad Ahmad	: Technician
Baharuddin Bahrol Zaman	: Technician
Hartine Awang	: Technician
Hasliza Mahd Yusuf	: Technician
Mohammad Suhairi Hj. Mohamad	: Technician
Mohd Zarinnizar Afif Bin Wahab	: Technician
Muhammad Tarmizi Ismail	: Technician
Zaleha Zainudin	: Technician
Zawani Ramli	: Technician

EC220 - Bachelor of Engineering (Honors) (Civil) EC701 - Master of Science in Structural Engineering EC702 - Master of Science in Geotechnical Engineering EC703 - Master of Science in Water Resources Engineering EC704 - Master of Science in Environmental Engineering EC705 - Master of Science in Construction Engineering EC706 - Master of Science in Highway Engineering EC750 - Master of Science in Civil Engineering EC950 - Phd in Civil Engineering

Bachelor of Engineering (Honours) (Civil) (EC220)

The bachelor degree in Civil Engineering with honours is a full-time 4 years programme. It is aimed at producing competent civil engineering to meet the manpower requirement of the construction industry. This degree is recognized by the Public Services Department (JPA), Malaysia. Graduates will be able to register as engineers with the Boards of Engineers, Malaysia (BEM) and to sit for the relevant examinations with the Institution of Engineers, Malaysia (IEM) to become professional engineers. The curriculum is designed to enable graduates to gain entry to a Master Degree program at any local or overseas university.

Programme Accreditation

For the award of a Degree, a student must have successfully complete the curriculum and obtained a minimum cumulative grade point average (CGPA) of 2.00

Career Opportunities

The Faculty of Civil Engineering has been awarded accreditation by the Engineering Accreditation Council (EAC) Malaysia. This is an indication of quality assurance and institutional excellence. The student can be confident that the university has met international criteria for qualified engineers. Upon graduation, it is prudent for an engineering graduate to register as a graduate engineer with the Board of Engineers Malaysia prior to employment as an engineer.

Admission Requirements

A pass in SPM or other equivalent qualifications recognized by the Malaysian Government with a minimum of five (5) credits including Mathematics, Physics, Additional Mathematics, Chemistry/Biology/Additional Mathematics/Civil Engineering Studies/Engineering Technology/ Design/ Construction Materials/ Construction Technology, Bahasa Melayu and a pass in English.

And

A pass in STPM with a minimum CGPA of 2.75 and achieving a minimum of grade B- in any two (2) subjects (Mathematics / Further Mathematics, Physics and Chemistry/ Biology),

Ör

A pass in Matriculation Programmes from the Ministry of Education, Malaysia or equivalent Foundation Programme recognized by the Malaysian Government with a CGPA of 2.75 and achieving a minimum of grade B– in any two (2) subjects and C in the other (Mathematics/ Engineering Mathematics/ Physics/ Engineering Physics and Chemistry/ Engineering Chemistry),

Or

A pass in Diploma in Civil Engineering, or in a relevant field from UiTM with a minimum CGPA of 2.50,

Or

A pass in Diploma in Civil Engineering, or in a relevant field from other institution recognized by Malaysian Government with a minimum CGPA of 3.00

Master Programmes by Coursework

A student pursuing a master degree by coursework is required to undertake two(2) semesters of taught examinable materials followed by one(1) semester of research dissertation. The courses are career-oriented and cover both theoretical background and practical design consideration.

There are Six (6) Master's Degree coursework programmes which offered by the faculty :

EC701 - Master of Science in Structural Engineering

To produce graduates who are both skilled in structural engineering principles and have the ability to apply and solve complex, open-ended engineering works and problems.

EC702 - Master of Science in Geotechnical Engineering

The geotechnical engineering masters of science course encompasses soil mechanics theory and applications in the fields of foundation and soil engineering.

EC703 - Master of Science in Water Resources Engineering

This programme is designed to broaden and enhance the understanding of water resources engineering through the integrative approach of teaching and research, focusing on key areas of interests.

EC704 - Master of Science in Environmental Engineering

To enhance the understanding of environmental engineering through teaching and research in key areas of interests while enhancing the ability to think critically and solve environmental engineering problems.

EC705 - Master of Science in Construction Engineering

This programme offers the student a myriad of exposure and opportunities in the construction industry. Graduates from the programme enter into areas of construction project management, consulting, and the pursuit of higher degree.

EC706 - Master of Science in Highway Engineering

This programme is designed to broaden and enhance the understanding of highway engineering. Graduates from the programme will learn theory and applications in the fields of highway engineering, and the pursuit of higher degree.

The duration for the Master's Degree by coursework programmes for full time and part time students as follows:

Mode and Duration

Full time1 and 2 yearsPart time2 - 4 years

Entry Requirements:

An Honour's degree in Civil Engineering with a CGPA of at least 2.75 from UiTM or any related field recognized by UiTM Senate

Or

An Honour's degree in Civil Engineering from other institutions of higher learning recognised by the UiTM Senate, **Or**

A degree in Civil Engineering with a CGPA of at least 2.50 with relevant experience in related fields (more than 2 years) recognised by the UiTM Senate

Ör

Passed professional examination IEM/BEM Part II

Master By Research

Postgraduate Programme by research consists of Master of Science (Civil Engineering) EC750. Potential students can choose their own supervisor from academic staff based on their interest and supervisor's expertise. The topics will be varied on wide range of research work in civil engineering field which cover structural engineering, earthquake engineering, geotechnical engineering, rock engineering, water engineering, environmental engineering, construction and project management. Each student need to prepare research proposal with 12 pages long prior to submission of application form.

Mode and Duration :

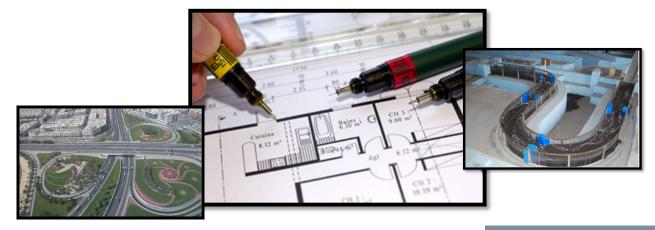
Full Time 1/2-3 Years Part Time 2 and 4 years

Entry Requirements:

An honours Bachelor Degree of Second Class Upper or higher in Civil Engineering or other related disciplines from recognised university, or equivalent qualification acceptable to the Senate of UiTM or possesses relevant and suitable research experiences and is keen on pursuing a postgraduate education.

* For the international candidate, a TOEFL score of 500 or IELTS score of band 5 or equivalence are required.

Candidates who are applying for admission into the Master of Science in (Civil Engineering) are required to have an honours degree of Second Class Upper or CGPA = 2.75 or CGPA = 2.5 for more than 2 years working experience or disciplines from a recognized university, or equivalent qualifications acceptable to the Senate of University Technology MA-RA. However, for candidates who are not in the possession of any of the above qualifications may be considered for admission if he/she possesses relevant and suitable research experiences and is keen on pursuing a post-graduate education.



PhD in Civil Engineering (EC950)

This is three-year full-time research programme. Students must complete a thesis of original work with significant contributions to the field of Civil Engineering at the end of the programme.

Mode and Duration

Full Time2-4 YearsPart Time3-6 Years

Entry Requirements:

A Master's Degree in Civil Engineering or in relevant fields, from UiTM or any institution of higher learning recognised by the UiTM Senate.

Or

Other qualification equivalent to a Master's Degree (in relevant field) with relevant experience in the related field recognised by the UiTM Senate.

* For the international candidate, a TOEFL score of 500 or IELTS score of band 5 or equivalence are required.



FACULTY OF CIVIL ENGINEERING, UITM

Bachelor of Engineering (Hons.) (Civil) EC220

Curriculum Structure

SEM	NEW CODE	Course		L	т	Р	Con. Hrs.	Exam	Pre- requisite Co- requisite*
	ECS416	STATICS	3	3	1	0	4	E	
	ECM414	ENGINEERING APPRECIATION	1	1	0	0	1	E	
	MAT435	CALCULUS IFOR ENGINEERS	3	3	1	0	4	E	
	ECG417	ENGINEERING GEOLOGY	3	3	0	0	4	FE	
SEM 01	CTU551	ISLAMIC AND ASIAN CIVILISATION	2	2	0	0	2	Е	
	ECM415	ENGINEERING DRAWING	2	1	0	2	3	E	
	KKR(1)	CO-CURRICULUM 1	1	0	0	2	2	Ν	
		SUB TOTAL CREDIT HOURS	15	13	2	6	19		
	ECS428	MECHANICS OF SOLIDS	3	3	1	0	4	E	
	ECG426	SOIL MECHANICS	3	3	1	0	4	E	
	ECS429	DYNAMICS	2	2	1	0	4	E	
0514.00	ECW422	FLUID MECHANICS	3	3	1	0	4	E	
SEM 02	ECG422	ENGINEERING SURVEY	3	2	0	2	4	E	
	ECG428	GEOTECHNICAL LABORATORY	1	0	0	2	2	N	ECG426*
	KKR(2)	CO-CURICULUM 2		0	0	2	2	N	
		SUB TOTAL CREDIT HOURS	16	13	4	6	23		
	CSC425	INTRODUCTION TO COMPUTER PROGRAMMING	3	2	0	2	4	N	
	ECM433	MECHANICAL AND ELECTRICAL ENG. PRACTICE	2	1	0	2	3	E	
	ECM442	CIVIL ENGINEERING QUANTITIES AND ESTIMATION	3	3	1	0	4	E	
	ECW435	HYDRAULICS	3	3	0	0	3	E	
SEM 03	ECW437	HYDRAULICS LABORATORY	1	0	0	2	2	N	ECW435
SEIN US	ECS436	ENGINEERING MATERIALS		2	0	0	2	E	
	ECS426	STRUCTURES AND MATERIALS LABORATORY		0	0	2	2	Ν	
	KKR(3)	CO-CURRICULUM 3		0	0	2	2	N	
		SUB TOTAL CREDIT HOURS	16	11	1	8	22		
	ECS444	BASIC TIMBER AND STEEL DESIGN	2	2	0	0	2	E	
	MAT455	FURTHER CALCULUS FOR ENGINEERS	3	3	1	0	4	E	
	ECG553	GEOTECHNIQUES	3	3	0	0	3	E	ECG426
	ECM446	CONSTRUCTION TECHNOLOGY		2	0	0	2	Е	
SEM 04	CTU553	ETHIC RELATION		2	0	0	2	Е	
	ECW445	ENV. ENGINEERING AND SUSTAINABILITY		3	0	0	3	E	
	ELC590	ENGLISH FOR ORAL PRESENTATIONS	2	2	0	0	2	Ν	
		SUB TOTAL CREDIT HOURS	17	17	1	0	18		

SEM	NEW CODE	Course	Cr. Hrs.	L	т	Р	Co n. Hrs	Ex a m	ECG413
	ECW557	ENGINEERING HYDROLOGY	3	3	0	0	3	Е	
	MAT580	FURTHER DIFFERENTIAL EQUATIONS	3	3	1	0	4	Е	
	ECS556	STRUCTURAL ANALYSIS	4	4	0	0	4	Е	ECS428
SEM 05	ECS555	NUMERICAL ANALYSIA AND FINITE ELEMENT METHODS	3	2	0	2	4	Е	
	EWC661	ENGLISH FOR REPORT WRITING	2	2	0	0	2	Ν	
	L3(1)	THIRD LANGUAGE 1	2	2	0	0	2	Ν	
		TOTAL HOURS	17	15	2	3	18		
	ECG564	HIGHWAY AND TRAFFIC ENGINNERING	3	2	0	2	4	Е	
	ECM566	CONSTRUCTION PROJECT MANAGEMENT	3	3	0	0	3	E	
	ECW567	WATER AND WASTEWATER ENGINEERING	3	3	0	0	3	Е	
	ECS559	REINFORCED CONCRETE DESIGN	3	3	0	0	3	Е	ECS559
SEM 06	ECW568	ENVIRONMENTAL ENGINEERING LABORATORY	1	0	0	2	2	Ν	
	L3 (2)	THIRD LANGUAGE II	2	2	0	0	2	Ν	
	ECC563	RESEARCH METHODOLOGY	1	1	0	0	1	Ν	
	STA408	STATISTICS FOR SCIENCE AND ENGINEERING	3	3	1	0	4	E	
		TOTAL HOURS	19	17	1	4	22		
	ECC577	FINAL YEAR PROJECT I	2	0	0	0	2	Ν	
	ECG524	PAVEMENT ENGINEERING	3	3	0	0	3	Е	
	ENT600	TECHNOLOGY ENTREPRENEURSHIP	3	3	0	0	3	E	
	L3(3)	THIRD LANGUAGE III	2	2	0	0	2	Ν	
SEM 07		ELECTIVE 1	3	3	0	0	3	Е	
		ELECTIVE 2	3	3	0	0	3	Е	
	ECM578	CONTRACT ADMINISTRATION	2	2	0	0	2	E	
		TOTAL HOURS	18	16	0	0	18		
	ECC588	FINAL YEAR PROJECT II	4	2	0	4	6	Ν	
SEM 08	ECC586	ENGINEERS IN SOCIETY	2	2	0	0	2	Е	
	ECC584	INTEGRATED DESIGN PROJECT (IDP)	4	1	0	6	7	N	ECS559, ECM44, ECG553, ECW567
		ELECTIVE 3	3	3	0	0	3	Е	
		TOTAL HOURS	13	8	0	10	18		
		TOTAL CREDICT HOURS	131						

After semes- ter 6/7	ECM598	ECM598	INDUSTRIAL TRAINING	4
			Total Credit Hour	135

LIST OF THE ELECTIVE COURSES

SEM	New Code	Course	Cr. Hrs.	L	т	Р	Con. Hrs.	Exam	Pre-requisite Co-requisite*
	ECG571	URBAN TRAFFIC MANAGEMENT	3	3	0	0	3	E	ECG564
	ECG573	FOUNDATION ENGINEERING	3	3	0	0	3	Е	ECG428,EGC553
	ECG575	GEOTECHNICAL ENGINEERING	3	3	0	0	3	Е	ECG428, ECG553, ECG426
	ECM571	PROJECT QUALITY MANAGEMENT	3	3	0	0	3	Е	ECM566
	ECM579	PLANNING AND PROJECT CONTROL	3	3	0	0	3	Е	ECM566
	ECS571	STRUCTURAL STEEL DESIGN	3	3	0	0	3	Е	
	ECW576	AIR POLLUTION ENGINEERING	3	3	0	0	3	FE	
	ECW581	GROUNDWATER ENGINEERING	3	3	0	0	3	FE	
	ECG579	GEOGRAPHICAL INFORMATION SYSTEM FOR CIVIL ENGINEER	3	2	0	2	4	Е	ECG422
	ECS528	PRESTRESSED CONCRETE DESIGN	3	3	0	0	3	Е	
SEM 07	ECS536	SPECIAL CONCRETE	3	3	0	0	3	Е	
	ECW532	SOLID WASTE ENGINEERING AND MANAGEMENT	3	3	0	0	3	E	
	ECW571	COASTAL ENGINEERING	3	3	0	0	3	Е	
	ECM557	PROJECT RISK AND MANAGEMENT	3	3	0	0	3	Е	
	ECM517	LAW ENGINEERING PRACTICE			0	0			

BACHELOR OF ENGINEERING (HONS.) (CIVIL)

<u>PART 1</u>

ECS416 STATICS

Statics is a subdivision of mechanics and deals with bodies at rest. Course includes mechanics of particles and rigid bodies, section properties, virtual work, analysis of trusses, cables and beams.

ECM414 CIVIL ENGINEERING APPRECIATION

This course introduces students to the roles and responsibilities of civil engineers in the development and advancement of human civilization and aims to stimulate students' interest in, and strengthen their motivation. This introductory course provides an early start to the development of the essential skills such as team working, communication in both written and verbal forms, critical and creative thinking and problem solving in engineering practices using CDIO (Conceive-Design-Implement-Operation) engineering education framework. It also includes active and experiential learning through problem-based learning exercises.

ECG417 ENGINEERING GEOLOGY

This course introduces the basic aspects of physical geology and engineering geology that related to civil engineering works. Principles of engineering geology will be emphasized in the scope of applied geology.

ECM415 ENGINEERING DRAWING

This course introduces students to apply technical drawing theory and skills and discuss the important of engineering drawing as a communication tool between parties in construction project. Students also learn to read and create engineering drawings using CAD software through individual assignments and group project.

BACHELOR OF ENGINEERING (HONS.) (CIVIL)

<u>PART 2</u>

ECS428 MECHANICS OF SOLID

Concepts of stress, strains and constitutive relations; stress and deformation of axially loaded members; thermal stresses; torsion of circular shafts; elastic bending; shear stresses in beams; composite stresses; stress transformation; deflection of beams and column buckling.

ECG426 SOIL MECHANICS

This course deals with the principles of soil mechanics and their applications for civil engineering works. It covers topics on basic soil properties for saturated and unsaturated soils, i.e. soil composition and classification, flow of water through soils, soil compaction and consolidation, stresses and strength behavior of soil, lateral earth pressures and earth retaining structures.

ECS429 DYNAMICS

Dynamics is a subdivision of mechanics of bodies and deals with bodies in motion. Topic covered includes kinematics and kinetics of particles and rigid bodies, Newton's Second Law, force-momentum formulation for systems of particles and rigid bodies in planar motion, work-energy concepts and vibration.

ECW422 FLUID MECHANICS

This course introduces students the basic concepts of fluid mechanics, including fluids under static and dynamic conditions and their application in civil engineering field.

ECG422 ENGINEERING SURVEY

This course deals with the work of surveying in Civil Engineering practices. Students will be introduced to surveying equipments, surveying techniques and analysis.

ECG428 GEOTECHNICAL LABORATORY

This course provides exposures to students on the basic theories and procedures in performing standard laboratory and field tests for soil for various civil engineering purposes.

<u> PART 3</u>

CSC425 INTRODUCTION TO COMPUTER PROGRAMMING

This course introduces the fundamental ideas of computer programming and algorithms. It emphasis on two discrete topics: problem solving and C++ programming. The problem solving topics include the design process, algorithm, and structure, whereas, C++ programming language topics include variable, data types, basic input and output, arithmetic, decision statement, loops, function, and scope.

ECM433 MECHANICAL AND ELECTRICAL ENGINEERING PRACTICE

This subject prepares the knowledge and understanding of the principle in electrical and mechanical to civil engineering student. The syllabus emphasis on studying electrical system and mechanical equipment installed in the various building. Student will be given an exposure on system building services operation. Electrical Installation Act and Uniform Building by Law are also introduced to the student.

ECM442 CIVIL ENGINEERING QUANTITIES AND ESTIMATION

This course is combination the knowledge of calculation of quantities and estimation the costs of the various items of civil engineering and associated works required in connection with the works in construction project.



ECW435 HYDRAULICS

This course covers the application of energy equation on incompressible pipe flow and analysis of pipe network to establish the design principles of water supply engineering. The design of open channel based on uniform flow condition will be discussed, followed by the application of specific energy concept and momentum equation for the analysis of non-uniform flow. Analysis of pump operation and performance and pump design are also introduced.

ECS436 ENGINEERING MATERIALS

This course covers four main engineering materials i.e. cementation, metallic, organic and inorganic materials. The emphasis are on concrete, steel, timber, bricks, bitumen, green and advanced materials. They are studied with reference to their compositions, properties, application, modification of some of their properties with respect to environmental effects and their behaviour at service. Presentation for problem solving activities is also engaged to teach students to communicate effectively, comprehend and write effective reports and documentation, perform effective presentation, give and receive clear instructions.

ECW437 HYDRAULICS LABORATORY

This course reinforces concepts introduced in basic fluid mechanics and hydraulics. Students are required to conduct experiments, analyze and interpret data and prepare laboratory reports.



ECS426 STRUCTURAL AND MATERIAL ENGINEERING LABORATORY

The laboratory works comprise of experiments on the properties of steel, timber and other construction materials. Experiments on mechanics of structures and on reinforced concrete structures are carried out. The determination of concrete constituents namely cement and aggregate, mix designing concrete and testing of fresh and hardened concrete properties are also covered.

<u>PART 4</u>

ECS444 BASIC STEEL AND TIMBER DESIGN

This course combines the knowledge on two prime areas; mainly structural steel design and timber design, and their relevant codes of practice and design procedures.

ECG553 GEOTECHNIQUES

This course deals with the fundamental of influence of stresses on a soil mass, compressibility, immediate settlement, consolidation settlement, time rate settlements and bearing capacities for foundation design and slope stability analysis. It also covers understanding of the objectives, planning, procedure and implementation of subsurface exploration. The course also highlights on the different types of in-situ test, laboratory test analysis and sampling techniques for different ground conditions.

ECW445 ENVIRONMENTAL ENGINEERING

This course introduces student to fundamental concept in environmental engineering and relationship between development and sustainability.

ECM446 CONSTRUCTION TECHNOLOGY

The course covers basic construction techniques, equipment, plants and technologies for sustainability development in the construction industry. This is to enable the students to understand the construction methods, stages involve and technologies associated with the construction project. The students were also introduced to the process of making the most effective approach in selecting the construction methods and techniques.

<u>PART 5</u>

ECW557 ENGINEERING HYDROLOGY

The course introduces the water resources' knowledge of fundamental that include hydrological cycle and concept of water budget. Water sources, precipitation, evaporation and infiltration processes are discussed in terms of measurements and analysis. Stream flow measurements, stage-discharge, rainfall-runoff relationships and hydrograph analysis are also explained in detail. Rational method, flood routing and the use of probability and statistical method in hydrologic analysis are presented. Applications of hydrology principles in urban stormwater design using procedures outlined in Manual Saliran Mesra Alam Malaysia (MSMA) are discussed. The course concludes with an introduction to hydrologic modeling and simulation.

ECS556 STRUCTURAL ANALYSIS

This course deals with analysis of force and deformations in statically determinate and indeterminate structures using where appropriate virtual work, moment-distribution, stiffness and flexibility, and approximate methods.

ECS555 NUMERICAL ANALYSIS AND FINITE ELEMENT METHODS

This course introduces the techniques for solving Civil Engineering problems using Numerical Analysis and Finite Element Method.

<u> PART 6</u>

ECG564 HIGHWAY AND TRAFFIC ENGINEERING

This course deals with the traffic engineering theory, traffic management studies, geometric design, traffic capacity and road safety audit. The course also covers basic theories and procedures in performing standard traffic fieldwork data collection and road safety audit.

ECM566 CONSTRUCTION PROJECT MANAGEMENT

This course introduces the overall concept of project management. Emphasis however will be given to its application in the construction industry. A brief introduction to basic management concept will be provided at the beginning of the course. The course content has been developed to accommodate all the major project management body of knowledge as stipulated by the Project Management Institute (PMI), USA.

ECW567 WATER AND WASTEWATER ENGINEERING

This course presents the fundamental design to be used in the practices of water supply (i.e. water treatment and distribution systems design), sewerage/sewer design systems and sewage treatment plants

ECS559 REINFORCED CONCRETE DESIGN

This course covers design and evaluation of reinforced concrete structures in accordance with relevant code of practice. It focuses on the design of reinforced concrete structural members including beams, columns, slabs, and shear walls. The students need to design and evaluate the reinforced concrete structural members.

ECW568 ENVIRONMENTAL ENGINEERING LABORATORY

This course emphasize on several critical quality tests involve in water and wastewater engineering. This course comprises eleven (11) experiments.

<u> PART 7</u>

ECC577 FINAL YEAR PROJECT 1

This subject represents the first part of an independent work guided by Faculty members. The each of the student must has a clear picture of the objective, scope of work, methodology and expected outcome before conducting any experiment / case study / simulation at the end of the semester. Each student must present their research proposal to the academic panels.

ECG524 PAVEMENT ENGINEERING

This course provides an in-depth study of the properties of constituent materials for asphalt concrete mixtures. Theory and practice of asphalt concrete mix for pavements, including specifications and construction methods for hot-mixes and surface treatment. The subject also covers on maintenance and rehabilitation of flexible pavements and relationships of materials engineering properties to pavement design and performance. This course also covers basic theories and procedures on related laboratory.

ENT600 TECHNOLOGY ENTERPRENEURSHIP

This course is intended to prepare graduates for the fast paced world of modern business concepts before they begin their careers as practicing civil engineers. The course will include such topics as initiating business, entrepreneurship, marketing, financing and contemporary business model. Students will become familiar with Business Planning related to the construction industry. E-commerce will also be examined and the implications of this new business model will be explored. Students will also be able to develop their verbal and written presentation skills. Guest speakers will compliment the experiences of the instructors and the course material.

ECM578 CONTRACT ADMINISTRATION

This course will discuss the contract administration process and present the tools available to administer the contract. Students will learn how to use specifications to develop contract goals, and will be introduced to a variety of general contract types and important clauses. Students will also learn how to select a contract type and develop contract clauses to meet specific contract goals. At the end of each chapter there are exercises designed to take students through the process of developing a sample contract document. In monitoring contract performance, students will learn the roles of the members of the contract administration team. Students will be introduced and use tools required to monitor contract performance, changes, disputes, delays, close out and payment. At the end of the course an exercise has been designed to present problems and students are required to use the tools of contract administration to propose a holistic solution.

<u> PART 8</u>

ECC588 FINAL YEAR PROJECT 2

This subject represents the culmination of an independent work guided by staff members of the Civil Engineering Department. The organization method of presentation and subject matter of the thesis are important in conveying to others the end result of the study.



ECC586 ENGINEERS IN SOCIETY

This course deals with interaction between engineers and society at large. Regulations and laws relating to civil engineering practice in Malaysia becomes prerequisite knowledge prior to registration with the Board of Engineers Malaysia. This course discusses contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problem. It further apply the ethical principles to profession-al ethics and responsibilities and norms of engineering practice.

ECC584 INTEGRATED DESIGN PROJECT

This course requires fundamental knowledge in analysis and design to expose students to real engineering design and practice. The course includes complex engineering problems and design systems, components and processes integrating core areas and meeting specified needs with appropriate considerations for public health and system, cultural, societal and environmental. Students are assigned with real design projects.

ELECTIVE COURSE

ECG571 URBAN TRAFFIC MANAGEMENT

This course provides fundamentals of traffic management principles in solving traffic movement problems in urban areas. The emphasis is on the application of theory to practice in solving traffic related problems in relations in relation to road traffic system, traffic network, traffic design elements, intersection design and control. Traffic impact assessment procedure is also highlighted. Transport policy, legislations, analytical techniques and issues related to public transportation and parking needs are also addressed.

ECG573 FOUNDATION ENGINEERING

This course deals with principles of foundation engineering design for different ground conditions. Foundation design and analysis will be for shallow and deep foundations. Review on soil parameters and methods of estimation of bearing capacity for foundation design. Types of foundation and issues related to foundation design on soft ground, karst and pile socketed into rock. A project based foundation design will be carried out by the students.

ECG575 GEOTECHNICAL ENGINEERING

This course deals with the principles of geotechnical analysis and design approach related to twodimensional flow in soil, retaining structures, ground improvement and slope risk assessment analysis for civil engineering purposes.

ECM571 PROJECT QUALITY MANAGEMENT

This course is designed to provide a comprehensive coverage of quality management. Emphasis will be placed on the major concept and principles of quality and quality management. Case studies and a project will be used to gain a better understanding of the implementation of quality management principles and process. The theory and implementation of quality management will be applied to the management of projects.

ECM579 PROJECT PLANNING AND CONTROL

This course will cover the knowledge area of project management that attempts to ensure project success through customer satisfaction within the constraints of time, cost and performance. Emphasis will be given on the aspects of defining a project well enough such that it could be designed to achieve its goals. Effective management of change throughout the whole lifecycle of a project will also be covered, given the current volatile business and economic environment. The course is relevant to Civil Engineering senior level undergraduate as well as post-graduate students in the area of construction project management.

ECS571 STRUCTURAL STEEL DESIGN

This course covers the design of structural steel elements and composite members in accordance to Eurocode 3 and Eurocode 4. It includes the structural steel grades, behavior of various types of steel members and frame under transverse and axial loads, as well as under combinations of these loads. Winds loading on structure using MS1553 are also covered in this course.

ECW579 AIR POLLUTION ENGINEERING

This course introduces the sources of air pollutant and its effects to human health and environment. The principle on the analysis of air quality and methods of air pollution control are discussed.

ECW581 GROUNDWATER ENGINEERING

The course is about the behaviour of groundwater profiles under various hydrogeological conditions. Basic concepts, terminologies, main processes and mechanisms of groundwater flow will be covered. Solutions to groundwater flow problems will be dealt fully. Finally, its application to pumping test analysis will be described using field data.

ECG579 GEOGRAPHICAL INFORMATION SYSTEMS (GIS) FOR CIVIL ENGINEERS

This course deals with the work of Geographical Information Systems (GIS) in Civil Engineering practice. Students will be introduced to GIS concepts for data capture, display and analysis in planning and as engineering solutions in the laboratory sessions.

ECS528 PRESTRESSED CONCRETE DESIGN

This course focuses on analysis and design of prestressed concrete elements. Students will acquire knowledge in basic principles of prestressing methods, analysis of sections for flexure and losses of prestress, deflections, design for beams at ultimate and serviceability limit states, design of end block, shear and torsional resistances, introduction to precast concrete elements such as precast hollow core slabs.

ECS536 SPECIAL CONCRETE

This subject deals with the use of different types of Special Concrete in constructions. It addresses their special properties, the materials selection, formulation, design, analysis, performance evaluation and limitations to meet specified needs with appropriate consideration for safety and environment.

ECW532 SOLID WASTE ENGINEERING AND MANAGEMENT

This course discusses the engineering and management aspects of municipal solid waste (MSW) in a manner that meets public health requirements and environmental concerns.

ECW571 COASTAL ENGINEERING

This course introduces the important forces in the coastal environment, namely wind, wave, tide, and related dynamic processes which happen in the nearshore zone, in particular, littoral transport and their impact on coastline and beach stability. Common engineering approaches to coastal protection and rehabilitation are discussed, including their design principles and effectiveness. Important considerations in physical and numerical modelling are introduced. The concept of integrated planning and management approach for the coastal zone are also presented.

ECM557 PROJECT RISK AND MANAGEMENT

This course introduces the implementation of tools and techniques needed to deliver constant project success with the developing and applying of a risk management plan that ensures customer satisfaction by taking balanced approach to quality, time and cost. By the end of this course, learners should be able to apply the principles and best practices of risk management when managing a project.

ECM517 LAW & ENGINEERING PRACTICE

The occupation of the civil engineering profession involves in rendering specialized services in the design and construction fields of engineering works and thus all civil engineer must be fully acquainted with laws relating to civil engineering works. Hence the main aim of this subject is to acquaint all civil engineering students to the regulations and laws in Malaysian relating to civil engineering practice. This subject will cover five distinct areas of laws and regulations in Malaysia as follows:

- 1. Contractual Law which would cover "Principle of Contract", "Legally Binding Contract", "Breach of Contract" of relevant construction contracts.
- 2. Local and Federal Authorities Regulations which would include "Uniform By Law".
- 3. E.I.A involves laws relating to environment, pollution, excavation, etc.
- 4. Construction Safety and Health Laws of CIDB and DOSH
- 5. Malaysian Industrial Labour Law.

MASTERS OF SCIENCE IN STRUCTURAL ENGINEERING (EC701)

ECS717 TALL BUILDING ENGINEERING

The subject deals with planning, analysis and design of tall building structures with emphasis on different structural forms of skyscrapers and their behaviour under various forces and appropriate modeling techniques for analytical purposes. Construction methods and building services for such structures are also highlighted.

ECS733 OFFSHORE STRUCTURAL ENGINEERING

The course deals with the analysis and design of coastal, floating and offshore structures. It also emphases on the current trends and development of technologies and materials used with respect to its construction and maintenance. Methods of construction and installation of steel jacket, concrete gravity structures, construction equipment, techniques of underwater concrete placement, submarine pipeline laying, inspection and maintenance are also included in this course.

ECS722 BRIDGE ENGINEERING

This subject deals with the introduction and understanding of the diverse aspects of planning, analysis, design and construction of practical small to medium span bridges, including bridge loading and articulation, erection methods and temperature effects of steel, concrete and composite bridges.

ECS762 SEISMIC DESIGN OF RC BUILDINGS

Seismic design of precast and reinforced concrete building includes the design of monolithic and precast concrete structural elements such as beams, beam-column joints, columns and wall panels. In seismic design, the behavior of joints in buildings plays a major role in the stability and structural integrity of the buildings. The major joints in reinforced concrete buildings are beam-column joints, supporting beam-slab joints and wall-foundation/beam joints. The detail design of these elements will be explained and elaborated using some examples of the current seismic code of practice such as Eurocode 8, NZ3101, IBC 2000 and FEMA 274. Detailing of systematic arrangement of reinforcement bars will be drawn using AUTO-CAD 2007.

ECS735 TIMBER ENGINEERING

The subject deals with the design of timber structural members that is beam, column, trusses, timber deck using solid timber and other engineered wood product such as GLULAM and plywood. The strength of the structure will normally be determined by the strength of the connections; its stiffness will greatly influence the displacement behaviour and the member sizes are often determined by the number of physical characteristics of the type of connector being used rather than by the strength requirements of the member materials. Therefore this subject also covers the design of timber joints using mechanical connectors.

ECS721 ADVANCED MECHANICS OF METAL STRUCTURES

The course will emphasize on the advanced behavior of metal structures and discussed the underlying mechanics behind the equations in the design code. The fundamental mechanics pertaining to the strength and stability of metal structures will be presented, and how the steel design code equations are developed based on these fundamental mechanics.

ECS719 ADVANCED MECHANICS OF CONCRETE AND PRECAST STRUCTURES

Most of the topics cover non-linear behaviour of reinforced concrete and precast structures under static and dynamics loading. Advanced mechanics properties of concrete including stress fields, stress-strain relationship in 2D and 3D, concepts of plasticity and elasto-plastic in reinforced concrete and precast structures, non-linear behaviour of unconfined and confined concrete and finally, development of momentcurvature analysis using non-linear behaviour of reinforced and precast concrete.

ECS726 STRUCTURAL REHABILITATION AND RETROFITTING

Course in Structural Rehabilitation and Retrofitting addresses the need to provide in-depth understanding on the causes, behavior, diagnostics, and repair methods of structural system or members in distress. This course will emphasize on advanced and applied knowledge on the materials, mechanics and repairing of the deteriorated system.

ECS718 FINITE ELEMENTS IN MECHANICS

This course will provide in-depth understanding of the finite element method of analysis, so that students can apply this method in solving structural engineering problems. Also, students will be taught to use available finite element computer package to solve complex structural engineering problems.

ECS725 STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

Dynamic response of Single-Degree of Freedoms (SDOF) and Multi-Degree of Freedoms (MDOF) of structural system subjected to varies types of dynamic loadings and ground motion. Elastic response spectrum to arbitrary ground acceleration and application to structural analysis. Identification of structural damage in reinforced concrete buildings and assessment using incremental dynamic analysis and fragility curve. Introduction to base isolation system which can reduce the damage and give better seismic performance of the structures.

ECD711 SUSTAINABILITY MANAGEMENT

This subject deals with the balanced view of sustainability in civil engineering with respect to environmental, economic and social dimensions. An understanding of all dimensions is necessary to provide optimal, sustainable solutions to technical problems. It addresses problems associated with civil engineering projects, regulatory, institutional issues and management tools used in managing these problems.

ECD737 DISSERTATION

This subject represents the culmination of an independent work guided by the academic staffs of the Faculty of Civil Engineering. The students are acquire to conduct experimental work in the laboratory or field work on site either taking sample or distribute questionnaire to the respondents. They also must identify the samples, locations and problem encountered in the research project. It is required that the student must indicate their research methodology so that the objectives can be obtained by the end of the study. After gaining all the data, the students should use any devices such as computer programming, statistical tools and computer software to solve the problem efficiently. They should make a comparison between the theoretical values with the experimental/field work in order to verify that their work is on the right track. Finally, its also to train the students to deliver their findings through technical and thesis writing. Furthermore, they are acquired to give presentation in front of two examiners by the end of semester. The result dissertation will be graded as pass or fail.

QMT710 OPERATIONS RESEARCH

This course introduces students to Operations Research as a quantitative tool in making effective decision in handling management and operational problems where resources are limited. Students will model and solve a variety of problems using Operations Research techniques. Topics covered are linear programming, transportation problems, integer programming and simulation. The focus in each topic is on central concepts and ideas, model formulation and essential assumptions, typical applications, key theories and techniques, software tools, interpretation of results, and limitations of the methods.



48



MASTERS OF SCIENCE IN GEOTECHNICAL ENGINEERING (EC702)

ECG713 ADVANCED SOIL MECHANICS

The subject deals with the different types of concept in soil volume change models that have been applied to describe the complex soil settlement behaviour which is very challenging in geotechnical engineering. The application of the models in predicting soil settlement behaviour due to loading and wetting will be dealt. Their advantages and weaknesses will be highlighted. The course also deals with the advance slope mechanics which can effectively analyse the complex soil behaviour in landslides involving the complex soil non-linear shear strength behaviour relative to net stress and suction.

ECG715 ADVANCED FOUNDATION ENGINEERING

The subject consists of the analysis and design of various type foundations such as driven pile, injection pile, micro-pile, bored pile, caisson and others. The design concept covers single and group piles for homogeneous, non-homogeneous ground and different load case. Other main considerations are pile installation techniques, pile load tests and analysis as well as the common construction practice and the related pile specification.

ECG716 SITE INVESTIGATION

The course covers a thorough understanding on the planning, procedure and implementation of site exploration by highlighting different types of in-situ test and analysis, sampling techniques and laboratory tests to determine design parameters. Site investigation on problematic ground and methods of testing and monitoring of geotechnical problems are highlighted. The procurement and costing for the SI work is also covered.

ECG723 EARTH RETAINING STRUCTURES

The course presents the principle and design approaches to earth retaining structures such as backfilled walls, sheet-pile walls, excavation supports, cellular cofferdam and earth reinforced walls. Different methods of analysis soil-structure interaction analysis and design through case studies will be carried out. Numerical methods will be introduced to the candidates. Mini projects in the form of design application and problem-solving to specific topics are assigned to strengthen the candidates' understanding of the mechanics.

ECG725 GROUND IMPROVEMENT AND REMEDIATION

The course will cover the different methods of ground improvement techniques for difficult problem ground conditions. It covers the choice of methods with respect to types of soil and its geologic structure, types and degree of improvement required. The emphasis is based on cost analysis, availability of equipments, time and possible damage to adjacent structures and effectiveness of each method. Also, the course has been designed with focus on environmental soil hazards and the efforts made for clean up and remediation. The field of Environmental Geotechnique is introduced to examine the problems of site investigation, site restoration, site encapsulation and waste disposal from the geotechnical perspective.





ECG726 ROCK ENGINEERING

This course requires the fundamental knowledge of engineering geology. It involves the principles of engineering mechanics ands its application to the design of the rock structure. The course content includes the engineering geology and classification of rock, rock mass classification system, rock mass strength and measurement, rock slope engineering, rock tunnel engineering, rock excavation techniques and support technologies.

ECG729 NUMERICAL MODELLING IN GEOMECHANICS

This course deals with finite element approach to solve real geotechnical problems. Solving methods will involve computational modeling or software simulation. The theoretical and application aspect of finite element in geotechnical engineering with respect to different constitutive models in soils will be also learned in detail.

ECG739 ENVIRONMENTAL GEOTECHNIQUES

The course deals with the study of the occurrence and sources of earth pollution. It covers the mechanics of earth pollution and methods available for remediation of contaminated earth. It also covers chemical and physical process of earth pollution process, sources and impact, monitoring techniques, environmental impact assessment, modeling pollution migration, waste management, strategies, assistance and regulations.

QMT710 OPERATIONS RESEARCH

This course introduces students to Operations Research as a quantitative tool in making effective decision in handling management and operational problems where resources are limited. Students will model and solve a variety of problems using Operations Research techniques. Topics covered are linear programming, transportation problems, integer programming and simulation. The focus in each topic is on central concepts and ideas, model formulation and essential assumptions, typical applications, key theories and techniques, software tools, interpretation of results, and limitations of the methods.

ECD711 SUSTAINABILITY MANAGEMENT

This subject deals with the balanced view of sustainability in civil engineering with respect to environmental, economic and social dimensions. An understanding of all dimensions is necessary to provide optimal, sustainable solutions to technical problems. It addresses problems associated with civil engineering projects, regulatory, institutional issues and management tools used in managing these problems.



MASTERS OF SCIENCE IN WATER RESOURCES ENGINEERING (EC703)

ECW717 WATER RESOURCES PLANNING AND MANAGEMENT

The principles of planning and management of water resources in Malaysia have evolved from a complex and dynamic circumstances. Hydrologic systems are highly variable both in time and space and the same resources are often managed to serve several purposes simultaneously. With the ever-increasing complexity and scale and pervasive role of technology, the need has been felt for its creative, comprehensive and critical planning. This subject introduces concepts, approaches and techniques that have been developed in recent times. The subject introduces systems engineering approach for the management and development of water as it is a critical factor of the environment and a crucial resource for survival and socioeconomic development.

ECW726 EROSION AND SEDIMENTATION

This course covers topics on the description of the physical properties of water and solid particles in terms of dimension and units, applications of dimensional analysis to representative erosion and sedimentation problems, logarithmic velocity profiles on hydraulically smooth and rough boundaries, threshold conditions between erosion and sedimentation of particles, moment stability analysis of a particle and its application to riprap sizing/design, bedform classification and geometry, bedload calculation using deterministic and probabilistic approach, turbulent mixing of washload, suspended load calculation, hyperconcentrated flows, field measurements of bed load and suspended load and total load formulas.

ECW728 HYDRAULIC STRUCTURES

This course considers various aspects of hydraulic structures including the types of structures, principles of design and analysis, with emphasis on the hydraulic aspects.

ECW737 COASTAL AND HARBOUR ENGINEERING

This course discusses the principles of coastal and harbour engineering with emphasis on littoral processes and harbour structures.

ECW738 GROUNDWATER POLLUTION AND ENGINEERING

This course deals with theoretical and geological background on groundwater existence and groundwater flow. It covers the hydrogeology of selected geological setting together with groundwater resource engineering and management. Groundwater chemistry and groundwater pollution (causes, migration and mitigation measures) are also assessed.

ECW745 FLOOD MITIGATION AND MANAGEMENT

The course presents the concepts, theories and issues in flood management and mitigation. It provides explanation on flood definition, types, causes and effects. It also covers watershed management, flood routing-hydrologic and hydraulic, flood modeling and mapping, structural and non-structural flood mitigation measures and flood economic analysis.

ECW748 ADVANCED WATER SUPPLY

This subject deals with water supply technology. It includes the study on water resources, water demand and water quality. It also covers the principles and applications of conventional and advanced water treatment processes and its distribution.

QMT710 OPERATIONS RESEARCH

This course introduces students to Operations Research as a quantitative tool in making effective decision in handling management and operational problems where resources are limited. Students will model and solve a variety of problems using Operations Research techniques. Topics covered are linear programming, transportation problems, integer programming and simulation. The focus in each topic is on central concepts and ideas, model formulation and essential assumptions, typical applications, key theories and techniques, software tools, interpretation of results, and limitations of the methods.

ECD711 SUSTAINABILITY MANAGEMENT

This subject deals with the balanced view of sustainability in civil engineering with respect to environmental, economic and social dimensions. An understanding of all dimensions is necessary to provide optimal, sustainable solutions to technical problems. It addresses problems associated with civil engineering projects, regulatory, institutional issues and management tools used in managing these problems.

MASTERS OF SCIENCE IN ENVIRONMENTAL ENGINNERING (EC704)

ECW715 ENVIRONMENTAL ASSESSMENT

The subject reviews the environmental resources available and identifies the causes of environmental degradation. The concept of sustainable developments and the impacts assessment methods and systems such as EIA/rating or performance tools will be covered.

ECW721 SOLID WASTE MANAGEMENT

This subject deals with the management of solid wastes which requires an understanding of technical, regulatory, economics, institutional and public policy issues. It covers the determination and classification of waste materials. It also covers the life-cycle assessments of the wastes. It describes the treatability studies and the treatment alternatives, on-site and off-site. Case studies will be discussed

ECW725 ADVANCED WASTEWATER TREATMENT AND TECHNOLOGY

The subject covers the concepts and principles of wastewater, volumes and composition, characterization of wastewater and sludge. It looks into the treatment of sewage by preliminary, secondary and tertiary treatment. Besides treatment of wastewater this subject covers various method of sludge treatment and disposal. Advance treatments include: biological nutrient removal, membrane technology, water reclamation and reuse, physico-chemical treatment, phyto-remediation, bioremediation, wetlands and chemically enhanced primary treatment.

ECW729 AIR POLLUTION

This subject deals with the study on the contemporary air quality issues including the effects of pollutants both locally and globally. A detailed examination on some of the causes, sources and effects of air pollution and their methods of controls is covered

ECW732 ENVIRONMENTAL MONITORING

This subject deals with various aspect of environmental monitoring. It covers physical, chemical and biological monitoring. Parameter selection and monitoring network design is also considered in this subject.

ECW735 HAZARDOUS AND INDUSTRIAL WASTES MANAGEMENT

This subject deals with the management of hazardous wastes which requires an understanding of technical, regulatory, economics, institutional and public policy issues. It covers the determination and classification of hazardous waste materials. It also covers the life-cycle assessments of the wastes. It describes the treatability studies and the treatment alternatives, on-site and off-site. Civil Engineering methods of redevelopments of contaminated sites will also be covered. Case studies will be discussed

ECW736 RISK AND HAZARD ASSESMENT

The subject introduces the concept of hazards and risks associated with a proposed project or existing facility. Commonly employed techniques used to quantify risk are presented. Case studies are used to give students the opportunity to have a feel of identifying hazards and quantifying the risks involved with a selected engineering project or facilities (HIRARC). Students ill also be introduced to the concept of Hazards and Operability Studies (HAZOP).

ECW747 MEMBRANE TECHNOLOGY FOR WASTEWATER TREATMENT

This course present the principles involved in the introduction to membrane type, fabrication method and application for water and wastewater treatment.

ECW748 ADVANCED WATER SUPPLY

This subject deals with water supply technology. It includes the study on water resources, water demand and water quality. It also covers the principles and applications of conventional and advanced water treatment processes and its distribution.

QMT710 OPERATIONS RESEARCH

This course introduces students to Operations Research as a quantitative tool in making effective decision in handling management and operational problems where resources are limited. Students will model and solve a variety of problems using Operations Research techniques. Topics covered are linear programming, transportation problems, integer programming and simulation. The focus in each topic is on central concepts and ideas, model formulation and essential assumptions, typical applications, key theories and techniques, software tools, interpretation of results, and limitations of the methods.

ECD711 SUSTAINABILITY MANAGEMENT

This subject deals with the balanced view of sustainability in civil engineering with respect to environmental, economic and social dimensions. An understanding of all dimensions is necessary to provide optimal, sustainable solutions to technical problems. It addresses problems associated with civil engineering projects, regulatory, institutional issues and management tools used in managing these problems.







MASTERS OF SCIENCE IN CONSTRUCTION ENGINEERING (EC705)

ECM727 CONSTRUCTION TECHNOLOGY AND PLANT MANAGEMENT

This course provides an understanding in the application of the construction plant and technology to manage and control the plants in accordance to policies operation, optimization and legalities. The course covers review of construction plant technology such as earthing plant operation and performance, lifting equipment, their specifications and capacities. It also covers on the management of construction plant/ equipment, plant selection and acquisition, financial and budgetary control, and operational management that includes plant maintenance and stock control, and also health and safety regulations. The construction technology such as trench support system, ground improvement, trenchless technology, dewatering, and underpinning will also be included.

ECM735 CONSTRUCTION WASTE MANAGEMENT

This course deals with the construction waste minimization and management techniques at construction site. The candidate will be taught on how to develop a construction waste management plan and the viable technologies for recycling construction waste such as metals, concrete, wood, stone and other building materials. This subject provide the techniques to separate waste materials at site either for reuse or recycle and provide an alternative mean of reducing waste to the landfill. The course also provides knowledge on the benefits for reuse and recycling of construction waste and the best practices of site waste management plan.

ECM750 PROFESSIONAL CONSTRUCTION PROJECT MANAGEMENT

This course covers the overall concept and philosophy of project management. Emphasis however will be given on the management of construction projects. Students will learn how to professionally manage a construction project from inception to completion, as well as how to close a project effectively. They will also learn the nature and characteristics of projects, which includes a thorough understanding of the stages in a project lifecycle. An introduction to the management of multiple projects or programme management will also be addressed. The course also deliberate on the various roles that could be held by construction project managers and the latest developments in project management.

ECM753 CONSTRUCTION LAW AND CONTRACT PROCEDURE

This course provides an understanding of the legal framework within which the construction industry operates. The legal framework includes statutes and subordinate legislation case law and the doctrine of precedent. The major divisions of law with particular reference to the distinction between law of contract, tort, crime, arbitration and property will be highlighted. Law of contract arbitration, civil engineering and building contract procedure will also be given an emphasis.

ECM755 QUALITY MANAGEMENT FOR CONSTRUCTION PROJECT

This course provides the concept of quality management in construction projects. It demonstrates the application of quality management principles in construction. This course also deals with the aspects of the material specifications, testing of conformance for concrete, steel and timber as construction materials. Case studies will be employed to help students to apply the knowledge in order to practice quality management based on the problems in construction project. This course also incorporates issues of using innovative materials or techniques to enhance the quality of the delivered projects.

ECM756 RISK MANAGEMNET FOR CONSTRUCTION PROJECTS

This course intended to engage students in active discovery of risk and risk management principles. Students will be prepared to business environment, developing an awareness of the challenges, the tools, and the process of implementing risk management for construction business. An effective risk management will reduce losses in terms of cost and time and also improve financial performance of the company.

ECM757 FINANCIAL MANAGEMENT FOR ENGINEERS

This course covers basic financial management concepts in decision makings, firm's value and budgetary planning and control which include financial analysis, long term forecasting and planning. Sources of capital, short and long term are being introduced and the cost of these capitals evaluated to determine the effective cost alternatives. The concept of capital budgeting and the application of various capital budgeting techniques to solve capital investment decisions.

ECM758 CONSTRUCTION SITE AND SAFETY MANAGEMENT

This course covers the aspect of site preparation, organization, material management, inventory control, material management and waste control. The quality management and assessment of construction site are included as an assurance of work quality. Students will also be taught on legislation requirements of the Occupational Safety and Health Act (OSHA) and Factories and Machinery Act (FMA) relating to construction site. Issues on construction site safety and health particularly on hazard identification, risk assessment and control measures on site activities will be discussed.

QMT710 OPERATIONS RESEARCH

This course introduces students to Operations Research as a quantitative tool in making effective decision in handling management and operational problems where resources are limited. Students will model and solve a variety of problems using Operations Research techniques. Topics covered are linear programming, transportation problems, integer programming and simulation. The focus in each topic is on central concepts and ideas, model formulation and essential assumptions, typical applications, key theories and techniques, software tools, interpretation of results, and limitations of the methods.

ECD711 SUSTAINABILITY MANAGEMENT

This subject deals with the balanced view of sustainability in civil engineering with respect to environmental, economic and social dimensions. An understanding of all dimensions is necessary to provide optimal, sustainable solutions to technical problems. It addresses problems associated with civil engineering projects, regulatory, institutional issues and management tools used in managing these problems.



MASTERS OF SCIENCE IN HIGHWAY ENGINEERING (EC706)

ECW711 SUSTAINABILITY MANAGEMENT

This subject deals with the balanced view of sustainability in civil engineering with respect to environmental, economic and social dimensions. An understanding of all dimensions is necessary to provide optimal, sustainable solutions to technical problems. It addresses problems associated with civil engineering projects, regulatory, institutional issues and management tools used in managing these problems.

ECH711 TRAFFIC AND HIGHWAY CAPACITY ANALYSIS

This course explores the underlying principles and analytical procedures used in performing capacity analyses of transportation facilities. Analytical techniques such as the United States TRB's Highway Capacity Manual procedures are presented. Use of commercially available software such as SIDRA and others will be applied.

ECH712 PAVEMENT REHABILITATION AND MANAGEMENT

The course presents the identification on the causes and patterns of different types of pavement distress, project-level pavement evaluation, techniques of rehabilitation and selection of preferred rehabilitation techniques, design and construction that can be applied for the various types of distress. In addition, it also introduces to pavement management systems, network and project level management processes.

ECH713 URBAN TRAFFIC MANAGEMENT

This course provides fundamentals of traffic management principles in solving traffic movement problems in urban areas. The emphasis is on the application of theory to practice in solving traffic related problems in relation to road traffic system, traffic network, traffic design elements, intersection design and control, transport policy, legislation and analytical techniques. Issues related to public transportation and parking needs are also addressed.

ECH714 GEOTECHNIQUES FOR HIGHWAY ENGINEERING

This course presents an overview of the various aspects of geotechnical engineering required for a road project. Site investigation methods, design parameters for soil and rock, design and construction of soil slopes and embankments, the selection, design and construction aspects associated with ground improvement techniques and earth retaining structures will be presented.

ECH715 PUBLIC TRANSPORTATION AND ITS

This subject covers the development and integration of public transportation system as well as intelligent transport system. It deals with operation, management, evaluation and travel demand estimation for urban public transportation system. In addition, facts concerning performance measure in public transportation system and the emerging technologies related to public transport and intelligent transport system are high-lighted.

ECH721 HIGHWAY GEOMETRIC DESIGN

This course emphasized on practical design aspects of the various elements of highway geometric design based on the latest geometric standards used in Malaysia. In addition to the highway design basics, intersection and interchange design will also be discussed. Use of commercially available computer software to assist in highway design will be introduced and applied as course assignment (mini project).

ECH722 PAVEMENT ANALYSIS AND DESIGN

This course presents the theory and application of flexible and rigid pavement design concepts. The general framework of the mechanistic-empirical design procedure and the individual components are also discussed in detail (traffic loadings, materials characterization, structural response calculations and pavement performance prediction). Overlay design will also be discussed. Pavement design software such as CIR-CLY and KENLAYER will be introduced in the course.

ECH723 ASPHALT MIX DESIGN

This course presents methods of designing asphaltic concrete mixes for flexible pavements. Aggregate and bitumen properties required for mix design will be presented. Both Marshall and Superpave mix design methods will be discussed in detail. Construction of asphalt concrete pavements will also be discussed. Finally special mixes will be introduced including PMA, SMA and Porous Asphalt.

ECH724 ROAD SAFETY ENGINEERING

This subject covers the multi disciplinary approach to planning for traffic safety and injury control. It covers topic on safety systems, diagnosis of road accident problems, development of counter measures, road safety audit, monitoring and program evaluation.

ECH725 URBAN TRANSPORTATION PLANNING

This course elaborates transportation planning that forecast travel demand and evaluates alternative systems, technologies and services. In addition, economic analysis in term of transportation is also discussed. Commercially available computer software such as PARAMICS, VISSIN or CUBE will be introduced in the course.

ECH726 HIGHWAY CONSTRUCTION AND TECHNOLOGY

This course provides an applied/working knowledge of the highway construction process, equipment, materials and quality control. This program reviews the entire highway construction process beginning with the planning, management, setting-out, earthworks, subgrade preparation and drainage, surface preparation, lay down and compaction of asphaltic concrete (including quality control/quality assurance (QC/QA)) and roadside finishes of the completed highway project.

ECH727 MIX DESIGN AND CONSTRUCTION FOR CONCRETE PAVEMENTS

This course presents mix design and construction aspects of concrete pavements. Aggregate and cement properties required for mix design will be presented. Concrete mix design method will be discussed in detail. Construction of concrete pavements will also be discussed. Finally design and special purpose mixes for heavy duty and industrial pavements including roller compacted concrete will be introduced.

QMT710 OPERATIONS RESEARCH

This course introduces students to Operations Research as a quantitative tool in making effective decision in handling management and operational problems where resources are limited. Students will model and solve a variety of problems using Operations Research techniques. Topics covered are linear programming, transportation problems, integer programming and simulation. The focus in each topic is on central concepts and ideas, model formulation and essential assumptions, typical applications, key theories and techniques, software tools, interpretation of results, and limitations of the methods.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) - Current

BACHELOR'S DEGREE IN CIVIL ENGINEERING

- PEO1: Demonstrate a high level of competency in their engineering practices within the global boundaries.
- PEO2: Practice the engineering profession based on sound principles and ethics with consideration of sustainability.
- PEO3: Demonstrate communication and leadership skills while recognizing the need for life-long

MASTER OF SCIENCE BY COURSEWORK

EC701 Structural Engineering

- PEO1: Practice with advanced knowledge in structural engineering.
- PEO2: Successfully engaged in solving complex engineering problems.
- PEO3: Progress in their career to leadership and managerial positions.

EC702 Geotechnical Engineering

- PEO1: Practice with advanced knowledge in *geotechnical engineering*.
- PEO2: Successfully engaged in solving complex engineering problems.
- PEO3: Progress in their career to leadership and managerial positions.

EC703 Water Resources Engineering

- PEO1: Capable environmental engineers who can push the frontiers by applying the advanced principles of science and engineering
- PEO2: Competent environmental engineers with leadership and innovative abilities

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) - Current

EC704 Environmental Engineering

- PEO1: Practice with advanced knowledge in environmental engineering.
- PEO2: Successfully engaged in solving complex engineering problems.
- PEO3: Progress in their career to leadership and managerial positions.

EC705 Construction Engineering

- PEO1: Practice with advanced knowledge in *construction engineering*.
- PEO2: Successfully engaged in solving complex engineering problems.
- PEO3: Progress in their career to leadership and managerial positions.

EC706 Highway Engineering

- PEO1: Capable structural and highway engineers who can push the frontiers by applying the advanced principles of science and engineering
- PEO2: Competent structural and highway engineers with leadership and innovative abilities
- Capable structural and highway engineers who can accomplish outstanding achievements through a cohesive team of industry players and organizations

MASTER OF SCIENCE BY RESEARCH

- PEO1: Demonstrate continuing and advanced knowledge with the capabilities to further develop and solve problems in the related or multi-disciplinary fields.
- PEO2: Evaluate and make decision in the situations without or with limited information by considering social responsibilities, leadership skills and related ethics.
- PEO3: Deliver conclusions or findings with good communication skills and recognize the needs for continuing professional development.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) -2018

MASTER OF SCIENCE BY COURSEWORK

EC701 Structural Engineering

- PEO1: Experts in structural engineering who can apply advanced knowledge and practical skills in structural engineering for sustainable environment.
- PEO2: Experts in structural engineering who ethically engaged to the society with social skills and professional values.
- PEO3: Experts in structural engineering who can alternately be a leader and a team member in providing scientific solutions to structural complex engineering problems with effective communication skills.
- PEO4: Experts in structural engineering who proactively manage information to improve their managerial and entrepreneurial skills for career advancement with lifelong learning skills.

EC702 Geotechnical Engineering

- PEO1: Experts in geotechnical engineering who can apply advanced knowledge and practical skills in geotechnical engineering for sustainable environment.
- PEO2: Experts in geotechnical engineering who ethically engaged to the society with social skills and professional values.
- PEO3: Experts in geotechnical engineering who can alternately be a leader and a team member in providing scientific solutions to structural complex engineering problems with effective communication skills.
- PEO4: Experts in geotechnical engineering who proactively manage information to improve their managerial and entrepreneurial skills for career advancement with lifelong learning skills.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) - 2018

EC704 Environmental Engineering

- PEO1: Experts in environmental engineering who can apply advanced knowledge and practical skills in structural engineering for sustainable environment.
- PEO2: Experts in environmental engineering who ethically engaged to the society with social skills and professional values.
- PEO3: Experts in environmental engineering who can alternately be a leader and a team member in providing scientific solutions to structural complex engineering problems with effective communication skills.
- PEO4: Experts in environmental engineering who proactively manage information to improve their managerial and entrepreneurial skills for career advancement with lifelong learning skills.

EC705 Construction Engineering

- PEO1: Experts in construction engineering who can apply advanced knowledge and practical skills in structural engineering for sustainable environment.
- PEO2: Experts in construction engineering who ethically engaged to the society with social skills and professional values.
- PEO3: Experts in construction engineering who can alternately be a leader and a team member in providing scientific solutions to structural complex engineering problems with effective communication skills.
- PEO4: Experts in construction engineering who proactively manage information to improve their managerial and entrepreneurial skills for career advancement with lifelong learning skills.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs) - 2018

EC706 Highway Engineering

- PEO1: Experts in highway engineering who can apply advanced knowledge and practical skills in structural engineering for sustainable environment.
- PEO2: Experts in highway engineering who ethically engaged to the society with social skills and professional values.
- PEO3: Experts in highway engineering who can alternately be a leader and a team member in providing scientific solutions to structural complex engineering problems with effective communication skills.
- PEO4: Experts in highway engineering who proactively manage information to improve their managerial and entrepreneurial skills for career advancement with lifelong learning skills.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PhD

- PEO1: Demonstrate in-depth knowledge with the capabilities to solve problems in the related or multi-disciplinary fields.
- PEO2: Perform critical analysis, evaluation and synthesis ideas without or with limited information by considering social responsibilities, leadership skills and related ethics.
- PEO3: Deliver conclusions or findings with good communication skills and recognize the needs for continuing professional development.







PROGRAM OUTCOMES (POs)

BACHELOR'S DEGREE IN CIVIL ENGINEERING

-		
PO1	Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.	
PO2	Identify, formulate, research literature and analyse complex civil engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	
PO3	Design solutions for complex civil engineering problems and design systems, components or pro- cesses that meet specified needs with appropriate consideration for public health and safety, cul- tural, societal, and environmental considerations.	
PO4	Conduct investigations of complex problems using research-based knowledge and research meth- ods including design of experiments, analysis and interpretation of data, and synthesis of infor- mation to provide valid conclusions.	
PO5	Create, select and apply appropriate techniques, resources, and modern engineering and ITtools, including prediction and modeling, to complex civil engineering problems, with an understanding of the limitations.	
PO6	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cul- tural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex civil engineering problems.	
PO7	Understand and evaluate the sustainability and impact of professional engineering work in the solu- tion of complex civil engineering problems in societal and environmental contexts.	
PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms of engi- neering practice.	
PO9	Function effectively as an individual, and as a member or leader in diverse teams and in multi- disciplinary settings.	
PO10	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.	
PO11	Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	
PO12	Recognize the need for, and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change.	

PROGRAM OUTCOMES (POs) -Current-

MASTER OF SCIENCE IN STRUCTURAL ENGINEERING

- PO1: Demonstrate mastery of knowledge in the field of *structural engineering*.
- PO2: Apply engineering skills to real and complex problems.
- PO3: Make ethical decisions taking into account the impact on society, environment and economy.
- PO4: Conduct technical studies adhering to legal, ethical and professional codes of practice.
- PO5: Establish leadership roles and apply managerial skills in structural engineering.
- PO6: Generate innovative and creative solutions to structural engineering problems.
- PO7: Effectively managed information and engaged in lifelong learning.

MASTER OF SCIENCE IN GEOTECHNICAL ENGINEERING

- PO1: Demonstrate mastery of knowledge in the field of geotechnical engineering.
- PO2: Apply engineering skills to real and complex problems.
- PO3: Make ethical decisions taking into account the impact on society, environment and economy.
- PO4: Conduct technical studies adhering to legal, ethical and professional codes of practice.
- PO5: Establish leadership roles and apply managerial skills in *geotechnical engineering*.
- PO6: Generate innovative and creative solutions to geotechnical engineering problems.
- PO7: Effectively managed information and engaged in lifelong learning.

PROGRAM OUTCOMES (POs)

MASTER OF SCIENCE IN WATER RESOURCES ENGINEERING

- PO1: Enhanced ability to apply advanced knowledge of mathematics, sciences, engineering and technology.
- PO2: Enhanced ability to solve water resource engineering problem through independent research.
- PO3; Enhanced ability to think critically and evaluate problems scientifically.
- PO4: Enhanced ability to communicate effectively water resource engineering solutions to multi disciplinary teams.
- PO5: Enhanced ability to solve complex water resource engineering problems through team work.
- PO6: Enhanced ability to make ethically informed decision with limited resources, considering impact on society, environment and economy.
- PO7: Enhanced ability to effectively manage information and engage in lifelong learning.
- PO8: Enhanced ability to apply managerial and entrepreneurial skills in water resource engineering projects.
- PO9: Enhanced ability to establish a leadership role through a high degree of autonomy with innovation.

MASTER OF SCIENCE IN ENVIRONMENTAL ENGINEERING

- PO1: Demonstrate mastery of knowledge in the field of *environmental engineering*.
- PO2: Apply engineering skills to real and complex problems.
- PO3: Make ethical decisions taking into account the impact on society, environment and economy.
- PO4: Conduct technical studies adhering to legal, ethical and professional codes of practice.
- PO5: Establish leadership roles and apply managerial skills in *environmental engineering*.
- PO6: Generate innovative and creative solutions to *environmental engineering* problems.
- PO7: Effectively managed information and engaged in lifelong learning.

PROGRAM OUTCOMES (POs)

MASTER OF SCIENCE IN CONSTRUCTION ENGINEERING

- PO1: Demonstrate mastery of knowledge in the field of construction engineering.
- PO2: Apply engineering skills to real and complex problems.
- PO3: Make ethical decisions taking into account the impact on society, environment and economy.
- PO4: Conduct technical studies adhering to legal, ethical and professional codes of practice.
- PO5: Establish leadership roles and apply managerial skills in *construction engineering*.
- PO6: Generate innovative and creative solutions to construction engineering problems.
- PO7: Effectively managed information and engaged in lifelong learning.

MASTER OF SCIENCE IN HIGHWAY ENGINEERING

- PO1: Enhanced ability to apply advanced knowledge of mathematics, sciences, engineering and technology.
- PO2: Enhanced ability to solve Highway engineering problem through independent research.
- PO3: Enhanced ability to think critically and evaluate problems scientifically.
- PO4: Enhanced ability to communicate effectively in Highway engineering solutions to multi disciplinary teams.
- PO5: Enhanced ability to solve complex highway engineering problems through team work.
- PO6: Enhanced ability to make ethically informed decision with limited resources, considering impact on society, environment and economy.
- PO7: Enhanced ability to effectively manage information and engage in lifelong learning.
- PO8: Enhanced ability to apply managerial and entrepreneurial skills in Highway engineering projects.
- PO9: Enhanced ability to establish a leadership role through a high degree of autonomy with innovation.

PROGRAM OUTCOMES (POs) -2018

MASTER OF SCIENCE IN STRUCTURAL ENGINEERING

- PO1: Apply advanced knowledge in the field of structural engineering.
- PO2: Apply practical skills of structural engineering to real and complex problems.
- PO3: Engaged to the society with social skills and responsibilities.
- PO4: Ability to exhibit values, attitudes and professionalism.
- PO5: Demonstrate leadership and teamwork role with effective communication skills.
- PO6: Generate innovative and creative problem solving solutions with scientific skills to structural engineering problems.
- PO7: Effectively manage information and engage in lifelong learning. Perform managerial and entre-

MASTER OF SCIENCE IN GEOTECHNICAL ENGINEERING

- PO1: Apply advanced knowledge in the field of geotechnical engineering.
- PO2: Apply practical skills of geotechnical engineering to real and complex problems.
- PO3: Engaged to the society with social skills and responsibilities.
- PO4: Ability to exhibit values, attitudes and professionalism.
- PO5: Demonstrate leadership and teamwork role with effective communication skills.
- PO6: Generate innovative and creative problem solving solutions with scientific skills to geotechnical engineering problems.
- PO7: Effectively manage information and engage in lifelong learning. Perform managerial and entrepreneurial skills for career advancement.

PROGRAM OUTCOMES (POs) -2018

MASTER OF SCIENCE IN ENVIRONMENTAL ENGINEERING

- PO1: Apply advanced knowledge in the field of environmental engineering.
- PO2: Apply practical skills of environmental engineering to real and complex problems.
- PO3: Engaged to the society with social skills and responsibilities.
- PO4: Ability to exhibit values, attitudes and professionalism.
- PO5: Demonstrate leadership and teamwork role with effective communication skills.
- PO6: Generate innovative and creative problem solving solutions with scientific skills to environmental engineering problems.
- PO7: Effectively manage information and engage in lifelong learning. Perform managerial and entrepreneurial skills for career advancement.

MASTER OF SCIENCE IN CONSTRUCTION ENGINEERING

- PO1: Apply advanced knowledge in the field of construction engineering.
- PO2: Apply practical skills of construction engineering to real and complex problems.
- PO3: Engaged to the society with social skills and responsibilities.
- PO4: Ability to exhibit values, attitudes and professionalism.
- PO5: Demonstrate leadership and teamwork role with effective communication skills.
- PO6: Generate innovative and creative problem solving solutions with scientific skills to construction engineering problems.
- PO7: Effectively manage information and engage in lifelong learning. Perform managerial and entrepreneurial skills for career advancement.

PROGRAM OUTCOMES (POs) -2018

MASTER OF SCIENCE IN HIGHWAY ENGINEERING

- PO1: Apply advanced knowledge in the field of highway engineering.
- PO2: Apply practical skills of highway engineering to real and complex problems.
- PO3: Engaged to the society with social skills and responsibilities.
- PO4: Ability to exhibit values, attitudes and professionalism.
- PO5: Demonstrate leadership and teamwork role with effective communication skills.
- PO6: Generate innovative and creative problem solving solutions with scientific skills to highway engineering problems.
- PO7: Effectively manage information and engage in lifelong learning. Perform managerial and entrepreneurial skills for career advancement .

PROGRAM OUTCOMES (POs)

MASTER OF SCIENCE (CIVIL ENGINEERING)

- PO1: Perform independent, critical, effective and well time-managed research, which contributes to existing knowledge.
- PO2: Design a comprehensive research structure to execute research work.
- PO3: Critically evaluate and interpret the research findings in the context of existing knowledge.
- PO4: Demonstrate the synthesis of information in written and verbal communication.

DOCTOR OF PHILOSOPHY (CIVIL ENGINEERING)

- PO1: Perform independent, critical, effective and well time-managed research, which contributes to new knowledge.
- PO2; Design a comprehensive research structure to execute research work.
- PO3: Critically evaluate and interpret the research findings in the context of new knowledge.
- PO4: Demonstrate the synthesis of information in written and verbal communication.

LABORATORIES IN THE FACULTY OF CIVIL ENGINEERING

Geotechnical, Highway & Survey Division	 Geology Laboratory Advanced Soil Mechanics Laboratory Soil Mechanics Laboratory (1) Highway Laboratory Transportation Engineering Laboratory Rock Mechanic Laboratory Survey Laboratory
Construction Engineering and Project Management Division	 Building Services Laboratory Concrete Laboratory Non Destructive Test Laboratory Fabrication Laboratory
Water Resources and Environmental Systems Di- vision	 Hydrology Laboratory Environmental (1) Laboratory Environmental (2) Laboratory Environmental (Research) Laboratory Fluid Mechanic Laboratory Hydraulic Laboratory
Structural and Computational Engineering Division	 Heavy Structure Laboratory Light Structure Laboratory Strength of Material Laboratory Office Design (1&2) Laboratory Office Design (3) Laboratory



FACULTY OF CIVIL ENGINEERING STUDENT HANDBOOK

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