## **Eligibility Requirements**

Candidates should possess either a recognised degree in Civil Engineering (or equivalent); or Associate Membership of a recognized professional Engineering Institute with a minimum of one year's relevant industrial experience.

#### Intake

#### Limited to 40 students

Course Fees

Tuition Fee: Rs. 350.000/= Other fees:

Rs. 1500/= Registration fees, Rs. 5000/= refundable deposit (library facilities) and Rs. 500/= Exam Fees

(All fees should be paid during registration)

### Duration of Course

- Master of Science 2 years Part Time
- PG Diploma 1 year Part Time
- All Lectures, assignments, seminars, field trips etc., will be conducted normally on Fridays and Saturdays.
- Those who proceed to do the M.Sc. will be requested to do a research project on part time or full-time basis in the second year.

#### Application and Inquiries

Application forms can be downloaded from www.mrt.ac.lk/web/civil For further details. contact: Course coordinator: Dr (Mrs.) A.S. Ranathunga Email: ashanis@uom.lk Course Assistant: Mrs. S.D.P.K. Peiris Tel: 011-2650567-8 Ext. 2135/2004

### Completed application forms should be forwarded to:

Dr (Mrs.) A.S. Ranathunga, Course Coordinator, M.Sc./PG Diploma in Geotechnical Engineering, Department of Civil Engineering University of Moratuwa, Katubedda,

## Geotechnical Engineering Course Team

## **University of Moratuwa**

Department of Civil Engineering: Prof U.G.A. Puswewala B.Sc. Eng. Hons (Moratuwa), M Eng. (AIT), Ph.D. (Manitoba), C.Eng., FIE(SL) Prof S.A.S. Kulathilaka B.Sc. Eng. Hons (Moratuwa), Ph.D. (Monash), C.Eng., MIE(SL) Dr U.P. Nawagamuwa B.Sc. Eng. Hons (Moratuwa), M.Eng. (AIT), Dr.Eng. (YNU), C.Eng., MIE(SL) Dr L.I.N. De Silva B.Sc. Eng. Hons (Moratuwa), M.Eng (Tokyo), Ph.D. (Tokyo), C.Eng., MIE(SL) Dr (Mrs) J.C.P.H. Gamage B.Sc. Eng. Hons (Moratuwa), M.Eng (Monash), Ph.D. (Monash), C.Eng., MIE(SL) Dr (Mrs) A.S. Ranathunga B.Sc. Eng. Hons (Ruhuna), Ph.D. (Monash), AMIE(SL)

#### Department of Earth Resources Engineering:

Dr A.M.K.B. Abeysinghe B.Sc. Eng. Hons (Peradeniya), M.Eng. (AIT), Ph.D. (Saga)

#### Visiting Staff

Prof B.L. Tennekoon - Emeritus Professor, University of Moratuwa B.Sc. Eng. (Cey), Ph.D. (Cambridge), C.Eng., FIE (SL) Prof M. Gunaratne, - Professor, University of South Florida, USA Ph.D., P.E. Prof H. S. Thilakasiri - Dean, Faculty of Engineering, SLIIT BSc. Eng. (Hons) Moratuwa, DIC & MSc. (UK), PhD. (USA), CEng, FIE(SL), IntPE(SL) Dr W. A. Karunawardena - Director General, NBRO B.Sc. Eng. (Moratuwa), M.Eng (Moratuwa), PhD (Kyoto), C.Eng, MIE (SL) Eng. Shiromal Fernando - Managing Director – CSEC BSc. (Moratuwa), MPhil (Moratuwa), C.Eng, MIE (SL) Dr J. S. M. Fowze - Specialist Engineer, Geotechnics and Foundations, CECB B.Sc. Eng.(Peradeniya), M.Phil (Peradeniya), PhD (AIT) Dr N. H. Priyankara - Snr Lecturer, Faculty of Engineering, University of Ruhuna B.Sc. Eng.(Moratuwa), M.Sc (AIT), PhD (Tohoku), C.Eng, MIE (SL), Eng. Mahinda Ratnasiri - General Manager, ELS B.Sc. Eng.(Moratuwa), M.Sc (Moratuwa), C.Eng, MIE (SL)



# M.Sc. / PG Diploma

in

## **Geotechnical Engineering**



## **Department of Civil Engineering**

University of Moratuwa

Moratuwa

CE 5401	Engineering Properties of Soil	Credits: 4.5	CE 5406	Ground Improvement Techniques	Credits: 2.5	CE 5411	Design Project	Credits: 4.0
Outline:						Outline:		
Mass volum soils, compa Consolidatio Behaviour o	e relationships, clay minerals and plasticity, c action, Effective stress concept, Flow of water on of soils, Shear strength of soils, critical s of residual soils and peaty clay	lassification of through soils, tate concepts,	Improveme drains, vacu columns, d overcoming improveme	nt of soft clay & peaty clay by; preloading, uum consolidation, electro osmosis, deep m ynamic compaction. Use of geosynthetics, v ; problems in expansive soils, Recent innovat nt techniques.	use of vertical iixing, granular vibrofloatation, ions in ground	An approv maximum	ed comprehensive design project done of four candidates under the supervision of	with a group of a staff member.

CE 5402	Engineering Geology	Credits: 4.0	CE 5407	Design and Construction of Shallow Foundations	Credits: 3.0	CE 5412	Research Seminar	Credits: 2.0	
Outline:						Outline:			
Geological geological c structures, classificatio	history & structure of the earth, Rock forr ycle, Igneous, sedimentary & metamorphic ro discontinuities in rock-mass, exploration in r n, Sedimentary deposit types, hydrogeology	ming minerals, ock, Geological ock, rock-mass	Types of for capacity un term settle bearing tes on unsatura	oundations, failure mechanisms and estimat der different conditions, Estimation of imme ments, Factor of safety and allowable bearing t, Estimation of modulus of subgrade reactio ated soils, Construction of shallow foundatior	tion of bearing diate and long- capacity, Plate on, foundations	Active part	ticipation in specially arranged research ser	ninars.	

CE 5403	Geotechnical Investigations	Credits: 3.0	CE 5408	Structural Design of Foundations	Credits: 2.5	CE 5414	Rock Mechanics	Credits: 3.0	
Outline:				Outline:			Outline:		
Planning a sampling, o Penetration Permeability Investigatio	site Investigation, Different methods of Ex- conduct and interpretation of insitu te Test, Cone penetration test, Vane she y tests, Pressuremeter test, Specifications and Writing reports	xploration and ests; Standard ar test, Field ons for Site	Structural design of shallow foundations; footings, strip and raft foundations, Structural design of deep foundations; driven and cast insitu piles and pile caps, piles subjected to lateral loads, Structural design of retaining walls				engineering material, rock mass classificati s, Stability of rock slopes and exposed surfa I properties of rock and determination i s between properties, Stress-strain and det e relations, Foundations on rock	ion, stereographic aces, Physical and in lab and insitu, formation in rock,	

CE 5404	Design of Dewatering Systems	Credits: 2.0	CE 5409	Design and Foundations	Construction	of Deep	Credits: 4.0	CE 5415	Slope Engineering	Credits: 4.0	
Outline:				Outline:					Outline:		
Introduction to Hydraulic modification, traditional dewatering methods, Fundamental soil-water relationships, pore pressures, Darcy's law, Hydraulics of slots and wells, interpretation of time-drawdown measurements, Design of dewatering systems				Types of deep foundations, Estimation of carrying capacity by; soil characteristics, insitu tests, wave equation and pile driving analyser, pile load tests, driving formulae. Negative skin friction, Design of single pile and pile groups, design of laterally loaded piles, construction of piles				Modes of S Time Dep Landslide H Site Specif	Slope instability, Deterministic Methods of endence of Stability, Probabilistic Meth Hazard Zonation, Effects of vegetation, Stab ic and global monitoring of Slopes	Stability Analysis, nods of analysis, ilization of slopes,	

CE 5405	Earth Retaining Systems	Credits: 4.0	CE 5410	Computer Applicat Foundations and Systems	ions in De Earth Re	esign of etaining	Credits: 3.5	CE 5490	Dissertation (for M.Sc.)	Credits: 20.0	
Outline:				Outline:					Outline:		
Earth Pressure Computation, Design of; Gravity Retaining Structures, Embedded Retaining Structures, soldier pile walls, Reinforced Concrete Retaining Structures, Reinforced Earth, Anchored Earth and Soil Nailing, Maintenance and Monitoring.				Boundary value problems, finite element method under small displacement & infinitesimal strain theory, Stress & strain analysis in a continuum, Constitutive relations for geo-materials, Seepage in soils, earth retaining systems, slope stability & foundation-soil interaction analysis by finite element software.				An approve a staff me examinatio	ed individual research project, done under to mber, and to be evaluated by a dissertaton.	the supervision of ation and an oral	