

Department of CIVIL ENGINEERING

STUDENT HANDBOOK 2020

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Faculty of Engineering University of Moratuwa, Sri Lanka

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1 INTRODUCTION

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1. INTRODUCTION

1.1 WELCOME BY THE HEAD OF DEPARTMENT

It is with great pleasure that I welcome you to the Department of Civil Engineering. Our Department is one of the strongest and well-established Academic Departments in the Sri Lankan University System. The current academic staff strength of 12 Senior Professors, 5 Professors, 20 Senior Lecturers and 1 Lecturer makes it an academically strong department even by international standards. Presently the department accommodates 500 undergraduates (125 in each batch) and more than 150 fulltime and part-time postgraduate students. While the flagship programme is the Bachelor of Science of Engineering Honours Degree (B.Sc. Eng. (Hons.)) programme, the Department also offers Postgraduate Degree Programmes (both taught courses and research degrees) as well as Continuing Professional Development (CPD) programmes and is also actively engaged in research and development activities.

The field of Civil Engineering is very broad, covering many areas such as planning, design and construction of buildings, highways and bridges, irrigation schemes, water supply and sewerage schemes, powerhouses and transmission systems, tunnels and underground structures, etc. It is an area where technologies are developing very fast, and with the sophistication of peoples' lifestyles and increase in population, Civil Engineers are called upon to face new challenges daily. It is our aim to provide you with the necessary education to face these challenges with confidence.

Our staff members continuously endeavour to enhance the quality of your learning experience using their versatile experience in postgraduate studies, research work and industrial partnerships. Exceptional research conducted at our department has not only produced high-impact research publications but also has attracted funding from both national and international funding sources including prestigious grants from the Royal Society, UK. Moreover, senior staff members at the Department of Civil Engineering have been awarded the President's Award for Scientific Publications by the National Research Council (NRC) for their outstanding research outputs.

The Honours Degree of Bachelor of the Science of Engineering Honours (B Sc Eng Hons) programme (Civil Engineering specialisation) offered by the Department is well-established. It has been conducted since 1972 and the Department has to date produced over 4000 graduates. The B.Sc. Engineering Degree programme has been continuously revised in keeping with changes in the educational system and needs of the profession. At present the programme offered by the Department of Civil Engineering extends over 8 semesters and covers the basics of the entire field of Civil Engineering, while permitting students to specialise in a narrower sub-discipline if they so desire. The curriculum enables students to acquire knowledge, understanding and skills, both of an intellectual and practical nature. The programme has the flexibility so that students could make their own choices and provides an environment that prepares students for the world of work. The department strives to provide a learning environment so that students could gain familiarity with state of the art technology and practices. Effort is taken to ensure that the desirable graduate attributes are achieved

through the teaching, learning and assessment schemes. The department has maintained accreditation with the Institution of Engineers, Sri Lanka (IESL) and the Washington Accord (an international accreditation agreement for professional engineering academic degrees over 18 countries including Australia, Japan, UK and USA). The department has converted the programme to Outcome Based Education (OBE) in order to provide a better educational experience to the students and fall in line with the system of engineering education in the more developed countries.

I wish you a very pleasant stay in the Department of Civil Engineering. The staff and I will make every effort to provide an education that will make you a competent Civil Engineer with significant knowledge and skills in design, analysis, synthesis, application techniques and management, who can serve the Civil Engineering Profession within and outside Sri Lanka with confidence and distinction.

1.2 DEPARTMENTAL VISION AND MISSION STATEMENT

The Vision of the Department of Civil Engineering is to be a centre of excellence of higher learning, research and related activities with emphasis on national relevance, international recognition, innovation and creativity in Civil Engineering.

The Mission of the Department of Civil Engineering is to develop educational programmes that provide educational, research and professional experiences that enable our graduates to become leaders in their professional careers, to pursue excellence in research and to serve the profession, community and nation, and be competitive in the international arena.

1.3 WHY STUDY CIVIL ENGINEERING?

Civil Engineers plan, design, construct, operate, and maintain facilities and systems that serve the basic needs of society. These include buildings, bridges, tunnels, roadways, railways, airports, harbours, dams, pipelines, and water and wastewater systems. Engineering, in general, is a problem-solving profession, and Civil Engineers focus their problem-solving capabilities on making our surroundings better places to live. Civil Engineers are frequently involved in city planning and in managing the use of natural resources. They face the challenges of meeting society's needs while protecting the environment thus ensuring sustainable development. Civil Engineering is a people-serving profession that provides a great deal of pride and achievement.

On graduation, there are numerous opportunities for students to pursue higher degrees covering a wide range of subjects. These include taught programmes leading to Master of Engineering or Master of Science degrees or research degrees leading to MSc/MPhil/PhD. These degrees provide students diverse opportunities in the industry and academia. Moreover, students graduating from the Civil Engineering Degree programme secure research scholarships to pursue the doctoral studies in leading universities in the world each year.

Obtaining the Civil Engineering Degree at University of Moratuwa ensures progression towards becoming a Corporate Member of the Institution of Engineers Sri Lanka and a Chartered Engineer designated by the IESL. In addition, our degree is recognized by the Washington Accord, enabling graduates to obtain memberships of Civil Engineering institutions in 18 member countries.

1.4 CAREER OPPORTUNITIES

Civil Engineers could work either in the private sector or state sector organisations. Career opportunities for Civil Engineering graduates range from small companies employing less than half a dozen civil engineers to international companies with branches in many parts of the world and employing many thousands of Civil Engineers and engaged in diverse projects.

Civil Engineers could work for a client, a consultant or a contractor. Organisations that commission a project are called clients. Not all clients however, would employ in-house engineers. Consultants are those civil engineers who plan and design projects. They translate the client's requirements into a feasible, cost effective project. Much of the work in a consulting firm is office based and would typically include preparation of tenders and drawings and design calculations. Contractors are those who employ labour, equipment and materials and transform the consultant's drawings into reality within the required time frame. Civil Engineers working for a contractor essentially manage the project on site.

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2 DEPARTMENT ORGANISATION AND ADMINISTRATION

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2. DEPARTMENT ORGANISATION AND ADMINISTRATION

2.1 HISTORY

The origin of the Department of Civil Engineering at University of Moratuwa can be traced back to year 1966 with the establishment of Ceylon College of Technology (CCT) at the present premises of the University. The CCT was converted to Katubedda Campus of the University of Sri Lanka in 1972 and the Department of Civil Engineering commenced its first

Degree programme leading to Bachelor of the Science of Engineering in the same year. From the very beginning of the establishment of the Katubedda Campus, the Department of Civil Engineering has been the largest academic Department in the campus with respect to student and staff numbers. With the commitment and enthusiasm of academics qualified in diverse areas of study and with the assistance of UNESCO, the Department was able to commence postgraduate programmes as early as in 1976.

The Katubedda Campus was converted to the University of Moratuwa in 1978 making it an autonomous University and since then the Department grew rapidly to its present state. Due to its large size and expertise in diverse areas, the Department operates under six Groups, all of whom conduct postgraduate taught programmes and research programmes leading to Masters and PhD qualifications. The quantum of teaching, research and consultancy activities handled by the Department perhaps makes it one of the most active Departments in the University.

From 1985 the Department is housed in its own building complex at a picturesque site bordering the North-Eastern boundary of the University, fringed by the Bolgoda Lake. The Civil Engineering building complex has many features of Civil Engineering design and construction and consists of a total built area of nearly 8000 m².

The main building of the Department of Civil Engineering houses many lecture halls, drawing rooms, a seminar room, a student study room, several purpose-built laboratories, a drawing office, a workshop, a graduate computer room and a computer centre and an auditorium which can accommodate 300 persons. It also provides office space for over 40 academic staff. Facilities are also made available for research staff and graduate students. The rock mechanics laboratory is located on the ground floor of a separate building which also has three lecture rooms on the upper floor each with a capacity of 35 students. The Civil Engineering Research Centre was completed in 2011. The Environmental Engineering Laboratory is re-located in the new building. The building has 2 lecture halls, each with a capacity for 150 students, a computer laboratory for 100 students, a GIS centre, space for research students and staff, and a canteen.

The 3-storied building for the UNESCO Madanjeet Singh Centre for South Asia Water Management (UMCSAWM), attached to the Department of Civil Engineering and funded by the South Asia Foundation (SAF), has been constructed at a location adjacent to the other buildings of the Department. The UMCSAWM is the newest member to join the UNESCO Madanjeet Singh Institutions of Excellence established with the objective of promoting regional cooperation through South Asian Water Management Education and a landmark in the Sri Lankan university history as the first regional centre established to conduct full-time postgraduate degree programmes. The centre building has 2 lecture rooms with a capacity of 30 students, a computer room, study area and library space for postgraduate students, space for academic staff, research students and research assistants of the programme. Further, an outdoor experimental area is available to conduct research as well as to demonstrate practical applications in three distinct water specialties, namely, Irrigation, Urban Storm Water Drainage, and Riverine and Estuary Ecosystems. An automated weather station, capable of measurement of prevailing climatic conditions in real-time and uploading to the web through satellite transmission networks, is set up at the Centre premises.

The latest addition to the Civil Engineering Department Complex is the Pavement Research Building. The Advanced Bitumen Testing and Accelerated Pavement Testing Laboratories are located in the building. The labs are equipped with the latest testing facilities to conduct research in bituminous materials, pavement mix deign and accelerated pavement testing. The laboratories have close collaborations with the industry conducting several CPD programmes on material testing and construction technology, involvement in investigating road construction materials and pavement designs, etc.

2.2 DEPARTMENT ORGANISATION

The Department has six specialised groups functioning for academic and research purposes. These Groups are:

- Building and Structural Engineering
- Construction Engineering and Management
- Environmental Engineering
- Geotechnical Engineering
- Hydraulic and Water Resources Engineering
- Transportation Engineering

2.2.1 BUILDING AND STRUCTURAL ENGINEERING GROUP

The Building and Structural Engineering group comprises eleven senior academic staff members, qualified at postgraduate level from leading universities in Australia, Canada, Japan, the United Kingdom and United States of America. It has four Senior Professors and seven Senior Lecturers, among seven of them are chartered engineers. The Group is responsible for conducting courses relating to structural engineering in all four years of the undergraduate programme. The Group contributes to the continuing professional development of the practising Civil and Structural Engineers in a significant way, by conducting a regular highly sought after Postgraduate Diploma / Master of Science Degree Programme in Structural Engineering on a part time basis; and many training programmes on specialised topics as and when required.

The staff members are actively engaged in research both in supervisory capacity at undergraduate and postgraduate levels and as research partners in sponsored research projects. The Group has established links with industry through these research programmes and also through the wide range of consultancy assignments undertaken. The Colombo Lotus Tower and the iconic Altair Towers are two landmark structures that the staff have been involved in. Much of the experimental research and consultancy assignments are carried out in well-equipped laboratories. Some of these have facilities, which are the only one of their kind in Sri Lanka. The most recent laboratory in the group is the Structural Dynamics & Health Monitoring Laboratory, with a shaking table. Apart from research in established structural engineering research areas, new areas of research include structural health monitoring, fibre reinforced polymers for structural retrofitting and deployable structures.

The expertise of the staff in this group is sought in the preparation of regulatory standards and related documents. The staff also serve on committees of learned societies thereby further enhancing the University – Industry collaboration. In particular, they are very actively involved in the Society of Structural Engineers, which is a professional body of structural engineers in the country incorporated by an Act of Parliament. One member of the Group is the local representative of the Institution of Structural Engineers, UK. Members of the group have also authored technical books that are widely used by students and practitioners.

2.2.2 CONSTRUCTION ENGINEERING AND MANAGEMENT GROUP

The Construction Engineering and Management Group consists of eight academic staff members, qualified at postgraduate level from University of Moratuwa and leading universities in Canada, Japan, Singapore and the United Kingdom. It has four Senior Professors, two Professors and two Senior Lecturers who obtained their postgraduate qualifications in the field of Construction Engineering and Management (CEM). Seven of them are chartered engineers with a wide range of experience in the broad field of construction. Members are also well qualified, experienced and hold administrative, consultancy and advisory leadership roles in government, non-government and business management sectors.

The group's high-quality undergraduate and postgraduate research outputs have been the source for solving many industrial issues related to construction engineering and management. Excellent research impact of the group attracted research partners and sponsors in national and international arenas to establish long-term collaborations in both research and industrial consultancy. Specifically, the ongoing impactful research in the group in areas such as project management, construction productivity, construction materials and methods, disaster management, digitalisation of construction industry, sustainable design and construction practises, has been able to produce high-quality research publications in peer-viewed journals and international conferences. The CEM Group jointly with Structures group, was a part of the University team who acted as consultants to the landmark project, world's first LEED Platinum rated Green Factory (*thurulie*) awarded by United States Green Building Council in year 2009. The CEM group provides the necessary Construction Engineering and Management inputs to the Civil Engineering undergraduate course and other postgraduate courses conducted by both Department of Civil Engineering and other departments in the University. Group's flagship Master's degree (M Sc) in Construction Project Management has attracted both national and international practising engineers to rise up in their professional careers. The staff members of this group undertake consultancy assignments and provide advisory services to the industry. The Construction Engineering and Management Group at Moratuwa is considered as one of the best places in the industry for construction engineering and management advice.

2.2.3 Environmental Engineering Group

Environmental Engineering Group has a strong resource base including two Professors and one Senior Lecturer with postgraduate qualifications, well-equipped laboratories and trained laboratory staff. It is one of the leading groups of Environmental Engineering academics in Sri Lanka, having obtained qualifications, training, research and working experience in Japan, New Zeeland, and the United Kingdom. Because the subject area of environment has a wider scope and various specialities, the group works very closely with other groups in the Department, Departments in the University and various state universities and private institutions in Sri Lanka.

The staff members of the Group conduct two compulsory courses and several elective courses in the undergraduate programme. The Environmental Engineering Group also conducts two postgraduate Diploma/MSc. programmes one in Environmental Engineering and Management and another in Environmental Management. There are also research students who pursue their research works in the field of Environmental Engineering leading to MSc, MPhil. and PhD. degrees. These postgraduate courses are sought after by many practising engineers and engineering and Management. Research outputs and impact of this group is highly commendable as those works directly contribute to the related communities in Environmental Engineering research across the globe. Specifically, the group's research is highlighted in the areas, certainly not limited to, environment engineering, sustainable practises, water pollution, environmental monitoring, water quality enhancement etc.

Further, the staff regularly conducts many consultancy and applied research assignments for industries and government institutions, such as conducting Strategic Environmental Assessments for Development Plans, Environmental Impact Assessments (EIA) for various projects, designs of water supply and wastewater treatment schemes, helping stake holders and decision makers in evaluation and analysis of environmental issues. The staff members within this Group have also undertaken various foreign funded international collaborative research. They also take part in various meetings, seminars and workshops for disseminating their knowledge on environmental matters, and for capacity building in state organisations.

2.2.4 GEOTECHNICAL ENGINEERING GROUP

The Geotechnical Engineering Group has five senior academic staff members in total with two Senior Professors, two Senior Lecturers and a Lecturer with postgraduate qualifications obtained from Universities in Australia, Canada and Japan. They are well-versed in research and consultancy through numerous projects handled both in Sri Lanka and overseas. Under the domain of Geotechnical Engineering, the group collaborates with partners from industry and other academic institutions to solve engineering problems in numerous fields such as slope stability, soil failure remedies, landslide analysis, earth retaining structures, ground improvements etc.

The Group has well-equipped laboratories of Soil Mechanics and Rock Mechanics that are capable of conducting all the standard laboratory tests for the determination of; basic soil characteristics, compressibility (consolidation) properties and strength (Direct shear and Triaxial) characteristics and engineering properties of rocks. Moreover, the group is furnished with the equipment needed to conduct many field tests such as; Vane Shear Test and Plate Bearing Test. Possession of such standard laboratory facilities and with the prowess of the staff members, this group is frequently invited for various industrial consultations and partnerships. Few of such expert-level contributions include slope stability analysis and rectification designs for; southern expressway, central expressway, Kandy - Mahiyangana road, design of ground improvements for; southern expressway, Colombo-Katunayaka expressway, analysis of failures in bridges, design of Earth retaining systems for roads schools and deep excavations.

The Group is responsible for conducting several compulsory and elective courses in the undergraduate programme. The group has conducted 8 Postgraduate Diploma /MEng courses in Geotechnical Engineering and Foundation Engineering. There are research students who pursue their research works in the field of Geotechnical Engineering leading to MSc, MPhil and PhD degrees.

2.2.5 HYDRAULIC AND WATER RESOURCES ENGINEERING GROUP

The Hydraulic and Water Resources Engineering Group comprises five senior academic staff members, qualified at postgraduate level from leading universities in Japan and Thailand. Well qualified and experienced academic staff members with one Senior Professor and four Senior Lecturers, this group carries the responsibility of teaching and research in Hydraulics, Water Resources Engineering, Coastal Engineering and related areas at both undergraduate and postgraduate levels. It also provides consultancy services for the industry and conducts industry driven short duration training programmes. Strong links with the industry and other academic institutions in both national and international arenas, the group has earned a good reputation for high-impact research, high-quality teaching and excellent project consultancy.

Members of this group have actively contributed to various projects, mainly as fieldexpert consultants. Detailed design of salinity barrier at Ambathale (Kelani river), impact assessment of the Colombo Port city on groundwater hydrogeology, Kandakadu diversion structure in Mahaweli river and preparation of coastal conservation and tourism development master plan are only few of the numerous expert-level consultancy work undertaken by the group members.

The Group has conducted over 10 postgraduate programmes in Hydraulic Engineering and Water Resources Engineering and Management since 1982 leading to the Postgraduate Diploma and/or Master of Science Degree. It has also embarked on research development related to Water Resource Engineering and by setting up a research centre dedicated for water resources related research called UNESCO Madanjeet Singh Centre for South Asia Water Management (UMCSAWM).

2.2.6 TRANSPORTATION ENGINEERING GROUP

The Transport Engineering Group is an integral part of the Department of Civil Engineering. It is comprised of one Senior Professor, one Professor and three Senior Lecturers who have obtained post-graduate qualifications in different areas of transportation engineering that include traffic engineering, highway engineering and transport planning. The group members have gained their postgraduate qualifications in Australia, Canada, Singapore and United States of America. It is a leading academic group in Transport and Highway Engineering within Sri Lanka. The Group is responsible for conducting lectures, practical sessions, field visits and research for civil engineering undergraduates under the domain of transportation engineering. The Group also conducts two postgraduate courses; MEng/PG Diploma in Highway & Traffic Engineering and MSc/PG Diploma in Transportation. The academic staff undertakes the supervision of full-time PhD/MPhil/MSc. research students and around 8 to 10 research students, work on different areas of research at any given time.

An increased Transportation Engineering component was introduced to the BSc Civil Engineering curricular in 1992 and subsequently revised in 2000 and 2009. Under the new curriculum, specialised transport courses are taught at second year and fourth year levels. Students are also introduced to advanced computer packages such as CUBE, VISSIM, CIRCLY, HDM4 and AutoCAD Civil 3D during the modules.

In addition to conducting the undergraduate and postgraduate course of studies, the Transportation Engineering Group has been carrying out fully-fledged research and consultancy programmes. Emphasis has been on applied research and the determination of applications for Sri Lanka. Research is also carried out at different levels of the academic programme in order to inculcate the principles and practice of research among the students. The Transportation Engineering Group also undertakes transport studies, traffic surveys, highway design, design of rigid and flexible pavements, feasibility studies, assessments and highway material testing. An emphasis is made on collaborative studies such as capacity building with private and state sector organisations. The Group is also conducting Continuing Professional Development Programmes (CPD) in all areas of transport. Transportation Engineering Group has four laboratories; highway engineering laboratory, traffic engineering laboratory, road safety and intelligent systems laboratory, and advance bituminous testing and accelerated pavement testing laboratory. It also maintains a resource centre which has an extensive collection of transport related literature including books, research thesis, project reports, design manuals, journals/conference proceedings etc.



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REFERENCE

Administration building No.01	AD 1
Administration building No 02	402
Architecture Building	ADZ
Architecture Building	AD
Architecture Design	AD
Basketball Court	BB
Boat Yard	BY
Buddha Statue	BS
	00
Canteen No. 1	C1
Canteen No. 2	C2
Canteen No. 3	C3
Canteen No. 4 Hostel village	C4
Cantoon No. F	01
Califernito, 5	05
Canteen (Civil Complex)	SBC
Canteen (Snack Bar Staff)	SBS
Canteen (Milk Bar)	MBC
Canteen (ODR)	ODR
Charried & Deserver	ODK
Chemical & Flocess Eng.	UP
Chemical & Process Eng. (New)	CPN
Civil Complex	CC
Civil Auditorium	CA
Classroom Block-	~
Classicoli Blocks	UB
Computer Science & Eng.	CS
Dean Office	DÓ
Design Center	DC
Farth Resource Eng	ES
Eladrical Care	20
Electrical Eng.	EE
Electrical & Tele. Eng.	EB
Elementary Labs	EL
English Department	182
Exam Hall 1	EU1
	Ent
Exam Hall 2	EH2
Fashion Design	FD
Gymnasium (New)	ĠN
Gymnasium (Old)	GO
Hostol	100
1100tci	
Hostel	нв
Hostel C	нс
Hostel D	HD
Hostel in First Lane	HE
Hostel Patuwathawithana	HP
Hostel Rabula Mawatha	
Hostel Office	но
IT Building (New)	IT
James George Hall	JG
L-Block	LB
Lecture Room Block	10
Library	LIX
Library	L
Madanjeet Singh Centre	MSC
Main Gate	MG
Management of Technology	MOT
Marine Building	MB
Materials Eng	48
Mathematics Department	AG
Mathematics Department	LB1
Mechanical Drawing Office	MD
Mechanical Office	MO
Medical Center	MC
Multipurpose Auditorium	MA
Nathell Court	
Netball Coult	NC
Pavilion Building	PB
Play Ground	PG
Polymer Laboratory	PI
Postoraduate Studies Div	402
Staff Lodgo	202
Oran Louge	SL.
Sumanadasa Building	SB
Tennis Court	TC
Textile & Clothing Technology	TB
Textile Auditorium	TA
Training Division	TD
Transport & Les **-	T
nansport & Log. Mn	ILM
Undergraduate Studies Div.	UD
Vc's Office	VC
Volleyball Court	VB
Work Shop Mechanical Eng	WS

2.3.1 CIVIL ENGINEERING MAIN BUILDING - GROUND FLOOR PLAN



Civil Main Building - Ground Floor



2.3.2 CIVIL ENGINEERING MAIN BUILDING - FIRST FLOOR & SECOND FLOOR PLANS



2.3.3 CIVIL ENGINEERING RESEARCH CENTRE – GROUND FLOOR & FIRST FLOOR PLANS



Civil Research Centre - Ground Floor

Civil Research Centre – First Floor

2.3.4 CIVIL ENGINEERING RESEARCH CENTRE – SECOND FLOOR & THIRD FLOOR PLANS



Civil Research Centre - Second Floor

Civil Research Centre - Third Floor

2.3.5 CIVIL ENGINEERING RESEARCH CENTRE – FOURTH FLOOR PLAN



Civil Research Centre - Fourth Floor

2.4 CONTACT INFORMATION

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2.5 STAFF

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CIVIL ENGINEERING STUDENT HANDBOOK 2020

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Senior Lecturers - Grade I

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 Group: Building and Structural Engineering

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 Group: Construction Engineering and Management

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Dr. (Mrs.) J. C. P. H. Gamage

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Group: Building and Structural Engineering

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BSc Eng Hons (Moratuwa), PhD (Cambridge) CEng, MIE (SL), MSSE (SL), MAIAA Ext: 2006 Room: CE 005 e-mail: yasithcm@uom.lk Group: Building and Structural Engineering

Senior Lecturers, Grade II

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Dr. H. R. Pasindu

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Dr. G. L. D. I. De Silva

 BSc Eng Hons (Moratuwa), M.Sc. (Moratuwa), PhD (Calgary)

 PEng (Alberta)

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 Room: Traffic Lab

 E-mail: dimanthads@uom.lk

 Group: Transportation Engineering

Dr. C. S. A. Siriwardana

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Dr. P. K. C. de Silva

BSc Eng Hons (Moratuwa), MSc (Moratuwa), PhD (Saitama) CEng, MIE(SL) Ext: 2577 Room: CERC 301 e-mail: kasunds@uom.lk Group: Hydraulic and Water Resources Engineering

Room: 014

Dr. H. G. H. Damruwan

BSc Eng Hons (Moratuwa), PhD (QUT)

Ext.: 2117

e-mail: hasithad@uom.lk Group: Building and Structural Engineering











CIVIL ENGINEERING STUDENT HANDBOOK 2020

Dr. H. L. K. Perera

BSc Eng Hons (Moratuwa), M.Sc. (K-State, USA), PhD (Uni Melb) CEng, MIE (SL), CMILT, EIT (USA)

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E-mail: loshakap@uom.lk

Group: Transportation Engineering

Lecturers

Dr. (Mrs.) A. S. Ranathunga

BSc Eng Hons (Ruhuna), PhD (Monash), MSPE Ext: 2223 Room: CE 008 e-mail: ashanis@uom.lk Group: Geotechnical Engineering

Academic Support

Mr. C. H. Satharasinghe

ACS (CSSL), BIT (Colombo), MSc (Peradeniya), MBCS, MIEEE (SL) Ext: 2122 System Analyst - Grade I

Mrs. V. P. Wickramatunga

BSc (Hons) in IT (SLIIT) Ext: 2550 System Analyst - Grade II

Mr. E. K. Zoysa

BSc (Biotechnology/Genetics/Chemistry)- Bangalore, MSc (Analytical Chemistry)- Colombo, (L.I.Chem.C.)

Ext: 2531

Analytical Chemist











2.6 EQUIPMENT AND FACILITIES

2.6.1 MECHANICS OF MATERIALS LABORATORY

Lecturer in Charge : Dr. (Mrs.) D. Nanayakkara

Technical Officer in Charge : Mrs. P. A. I. D. Perera

Equipment	Application	
Timber Testing Machine	Testing of timber for compressive strength, flexural	
	strength, shear strength and impact strength	
Tensometer (Capacity - 2 Tons)	Tensile testing of standard circular specimens, flat plates	
Tensometer (capacity 2 Tons)	and wires	
	This experimental apparatus provides visualization and	
	proof of the basic theory of bending moments in a beam.	
Bending moment apparatus	Using this apparatus, students can investigate the variation	
	of bending moment at a point away from the point of	
	loading of a simply supported beam.	
	This experimental apparatus provides visualization and	
	proof of the basic theory of shear forces in a beam. Using	
Shear force apparatus	this apparatus, students can investigate the variation of shear	
	force at a point away from the point of loading of a simply	
	supported beam.	
	An experimental apparatus to allow students to investigate	
D' '11 I'	the difference between axis of bending and axis of bending	
Biaxial bending	moment when the applied moment is about a non-principal	
	axis of the section.	
G1	An experimental apparatus for determining the shear centre	
Shear centre apparatus	of a cross-section of a given specimen	
Classification of the second second	An experimental apparatus to allow students to investigate	
Shear force apparatus	the variation of shear force on a supported specimen	
	An experimental apparatus to allow students to investigate	
Torsion apparatus	the relationship between torque and twist in the elastic	
	region of solid circular sections in various materials.	
	An experimental apparatus to allow students to investigate	
Buckling of struts apparatus	the deflection and stability of struts under various end	
	conditions.	



Mechanics of Materials Laboratory
2.6.2 BUILDING MATERIALS LABORATORY

Lecturer in Charge	:	Dr. K. Baskaran
Technical Officer in Charge	:	Mr. H. T. R. M. Thanthirige

Equipment	Application		
Universal Testing Machine	To determine the tensile strength of steel		
	Compressive strength and flexural strength of concrete.		
Versa Tester	To perform Tensile test and compression test		
Heat of Hydration Calorimeter	To determine the heat of hydration of cement		
Blaine fineness apparatus	To determine the fineness of cement		
Vicat Apparatus	To determine the setting time of cement		
Le Chatelier Apparatus	To determine the soundness of cement		
Aggregate crushing value test apparatus	To determine the mechanical properties of coarse aggregate		
10% Fines value test apparatus			
Aggregate Impact test apparatus			
Test sieves (BS & ASTM)	To determine the particle size distribution of coarse and fine aggregates		
Air Entrainment Meter	To determine the air content in fresh concrete		
Slump cone/Compacting Factor Apparatus	To determine the workability of fresh concrete		
V-B Consistometer			
Setting time of Concrete test apparatus	To determine the initial and final setting time of concrete in accordance with ASTM specifications		
Humidity cabinet/ Length comparator	To determine shrinkage of concrete, mortar and cement paste under controlled humidity and temperature conditions.		
Concrete Core cutting m/c	To extract concrete cores of dia. 2" – 4"		
Mortar Mixer	To mix mortar		



Building Materials Laboratory

2.6.3 STRUCTURAL TESTING LABORATORY

:

Lecturer in Charge

Dr. H. M. Y. C. Mallikarachchi

Technical Officer in Charge :

Mr. D. M. N. L. Dissanayaka

Equipment	Application
Universal Testing Machine (1.000 kN)	To test steel (circular specimens, flat plates and
	wires) for tensile strength. Testing of concrete cubes,
	cylinders for compressive strength.
	To Test concrete cubes, cylinders for compressive
Amsler Testing Machine	strength. Testing of wall panel for compressive
(2000 kN)	strength. Testing of concrete beams for bending
	strength.
Compression Testing Machine	To Test concrete cubes, cylinders for compressive
(digital)(2,000 kN)	strength.
Test Rig mounted on 750 mm	To test wall panel for compressive strength.
thick strong floor	To test concrete beams for bending strength.
(capacity: 1000 kN)	To load test manhole covers, welded rails.
(To conduct three edge bearing test for hume pipes.
Concrete Cover Meter	To measures the depth of cover over reinforcement
	bars.
	To record continuous measurements of strain gauges,
Data Logger (TDS 530)	thermocouples, strain gauge based (full bridge)
	transducers and DC voltage.
Data Logger DL2e	For thermal measurements.
Ultrasonic Pulse Velocity	For quality control and inspection of concrete.
Tester	
Rebound Hammer	To determine the surface hardness of concrete.
Digital Resistivity Meter	To measure the electrical resistivity of concrete.
Proving Rings (10 kN, 30 kN,	For compressive load measurements.
100 kN, 300 kN, 2000 kN)	
Mechanical Dynamometer	To determine tension force.
Hydraulic Jacks and Pumps	For loading.
(100 kN, 250 kN, 500 kN)	
Laser Displacement Sensors	For displacement measurements.
50 kN overhead graps	For erecting loading frame and positioning heavy
SU KIN OVERNEAD CRANE	specimens.







Structural Testing Laboratory

2.6.4 STRUCTURAL DYNAMICS & HEALTH MONITORING LABORATORY

:

Lecturer in Charge

Dr. C. S. Lewangamage

Technical Officer in Charge :

Mr. T. P. D. G. I. Yohan

Equipment	Application
Servo Electric Shaking Table	Uni-axial shaking table for earthquake simulations
Vibrometer	Acceleration and noise measurements



Uniaxial shaking table



Vibrometer

2.6.5 **BUILDING SCIENCE LABORATORY**

:

Lecturer in Charge

Dr. (Mrs.) J. C. P. H. Gamage

Technical Officer in Charge :

Mr. D. M. N. L. Dissanayaka

Equipment	Application
Digital Aerosol Monitor	All equipment are used for undergraduate and postgraduate
Digital Sound Level Meter	also used for demonstration purposes to students following
Data Logger	the subjects Building Engineering, HVAC & Building
Moisture Analyser	Automation.
Humidifier & Controller	
Anemometer	
Wind Speed & Direction Instrument	
Digital Lux Meter	
Sunshine Reader	
Photometric Sensor and Measuring Unit	
Ultraviolet Measuring Unit	
Whirling Hygrometer	
Stevenson Screen	
Sound Level Meter with Sound Calibration	
Sound Level Meter Kit	
Thermo Hydrograph	
PM Meter	
VOC Meter	

2.6.6 COMPUTATIONAL MECHANICS LABORATORY

:

- Lecturer in Charge

Dr. H. M. Y. C. Mallikarachchi

- Technical Officer in Charge : Mrs. D. N. Ranawaka

Equipment/Software	Application
High-performance workstations	Advanced computer modelling of complex structures and
Mola Structural Kit	experimental verification
Abaqus FEA package	Teaching computational mechanics
LS Dyna FEA package	



Computational Mechanics Laboratory

2.6.7 MANAGEMENT INFORMATION SYSTEMS (MIS) LABORATORY

Lecturer in charge	:	Prof. A. A. D. A. J. Perera
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Technical Officer	•	Mrs II Rukma
Technical Officer	•	MIS. U. Kukina

Software Package	Application
Microsoft Project and Microsoft	For Planning and Monitoring of Construction Projects
Project Server	
Primavera	For Planning and Monitoring of Construction Projects
CIS-Billest	Enterprise Resource Planning (ERP)System for
	Construction Industry.
AutoCAD Revit Architecture	For building design and construction (Building
	Information Modelling (BIM))
	Autodesk Revit is a single application that includes
	features for architectural design, MEP and structural
	engineering, and construction.
AutoCAD Revit MEP	For design and construction documentation solution for
	mechanical electrical and plumbing (MEP)
	Engineering

Equipment	Applications
Computer Server	To host ERP System, SharePoint Services, and other software with server architecture.
Personal Computers	30 Nos

2.6.8 Environmental Engineering Laboratory

Lecturer in Charge	:	Prof. J. M. A. Manatunge
Technical Officer in Charge	:	Mrs. N. S. Gunathilake
Analytical Chemist	:	Mr. E. K. Zoysa

Equipment	Application	
Atomic Absorption Spectrophotometer	To determine the content of Heavy Metals	
	To determine the Total Phosphorus, Total Nitrogen,	
UV VIS Spectrophotometer	Total Iron, Chlorophyll, Analysis of Kinetics of	
	chemical reaction	
Ion Chromatography Instrument	Determination of Anions	
Centrifuge unit	Sample preparation	
Turbidity Meter	To measure Turbidity	
Portable water quality Meter	To measure in-situ field parameters eg. pH, Conductivity, TDS, DO, Salinity, Temperature	
Conductivity Meter	To measure Conductivity	
pH Meter	To measure pH	
Titration Equipment	To measure Alkalinity, Dissolved Oxygen	
Muffle Furnace	To determine the content of Volatile Suspended Solids, Sulphates	
Deionizer	To produce deionised water for reagent preparation	
Distilled Water Plant	To produce distilled water for reagent preparation	
Fume Hood	To conduct extraction/ distillation under safe environment	
Microbiological Incubator	Microbiological Examinations: Total and Faecal Coliforms	
Colony counter	To count microbial colonies	
Filtration Equipment	To determine Total Suspended Solids	
Drying Oven/Hot box oven	Sample drying	
Autoclave instrument	Sample sterilization	
Binocular microscope with camera	Microbiology study	
Cooled Incubator	To determine Biochemical Oxygen Demand	
COD apparatus	COD digestion and analysis	
Kjeldhal Instrument	Determination of kjeldhal Nitrogen	
	To determine concentration of volatile organic substances (autraction of organic substances from soil	
Gas Chromatography/Mass Spectrometer	and other media.	
Jar-Test apparatus	To determine optimum coagulation dose	
Four and Five decimal balance	Mass determination (Gravimetric methods)	
Water sampler	Field water sampling	
Refrigerator	Sample storage	
Laboratory Fume Hood	Safety from toxic gas	
Laminar Air Flow cabinet	Safety from microbial contaminations	
Safety shower	Safety/Emergency clean-up	
Rotary Evaporators	Liquid sample extraction	



Environmental Engineering Laboratory

2.6.9 SOIL MECHANICS LABORATORY

:

Lecturer in Charge

Dr. L. I. N. De Silva

Technical Officer in Charge :

Mr. H. A. M. I. T. Hettiarachchi

Equipment	Application
Classification Tests	
Casagrande Apparatus	To determine the Liquid Limit and Plastic Limit
Sieve Set	To perform Particle Size Analysis
Hydrometer	To perform Hydrometer Analysis
Specific Gravity Bottle Test	To determine the Specific Gravity
Vibrating Table	To determine the Relative Density
Strength Tests	
Trionial Testing Apparetus	To perform Unconsolidated Undrained Triaxial Test
(with or without electronic date	To perform Consolidation Drained Triaxial Test
(with or without electronic data	To perform Consolidated Undrained Triaxial Test
acquisition)	with Pore Water pressure Measurement
Unconfined Compression Test	To perform Unconfined Compression Test
Apparatus	
Direct - Shear Test	To conduct Direct Shear Tests on soils
(with or without electronic data	
acquisition)	
Compressibility and Permeability	
Concelidation Test Amountus	To perform One Dimensional Consolidation Test
Consolidation Test Apparatus	To determine the Swelling Index
Rowe Cell	To measure both settlement and pore water pressure
Kowe cen	during consolidation
Falling Head Apparatus	To perform Falling Head Permeability Test
Constant Head Apparatus	To perform Constant Head Permeability Test
Compaction Test	
Proctor Compaction Apparatus	To perform Proctor Compaction Test
(Standard and Modified)	
CBR Laboratory Test Apparatus	To perform CBR test Under Soaked or Unsoaked
	Condition
In-situ tests	
Core Cutter Apparatus	To determine the In-situ Density
Sand Cone Apparatus	To determine the In-situ Density
Vane Shear Apparatus	To perform Vane Shear Test
Field CBR Test Apparatus	To perform Field CBR Test
Cone Penetrometer	To perform Cone Penetration Test
Mackintosh Probe Test Apparatus	To perform Mackintosh Probe Test
Plate Loading Test Annaratus	To perform Plate Loading Test to assess bearing
rate Loading rest Apparatus	Capacity of Soils



Soil Mechanics Laboratory

2.6.10 ROCK MECHANICS LABORATORY

Lecturer in Charge :	Dr. L. I. N. De Silva
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Technical Officer in Charge : Mr. H. A. M. I. T. Hettiarachchi

Equipment	Application
Los Angeles Abrasion Test Apparatus	To perform Los Angeles Abrasion Test
Point Load Test Apparatus	To determine the Point Load Index
Core Drilling Machine	To perform Extrusion of Core Samples
Slake Durability Test Apparatus	To perform Slake Durability Test
Uniaxial Compression Machine	To determine Uniaxial Compression Strength of rock core Samples



Roch Mechanics Laboratory

2.6.11 HYDRAULIC ENGINEERING LABORATORY

Lecturer in Charge	:	Dr. T. M. N.	Wijayaratna

Technical Officer in Charge :

Mr. H.W. Kumarasinghe

Equipment	Application
Circular Orifice Apparatus	To study flow through orifices and determine coefficients of discharge, velocity and contraction for a circular orifice
Pelton Wheel Turbine	To study hydraulic performance and obtain characteristic curves for a Pelton turbine
Centrifugal Water Pump	To establish the head-discharge characteristic for a centrifugal pump
Series & Parallel pumps	To study the effects of having pumps in series or parallel
Flow Measuring Apparatus	To determine the coefficients of discharge and obtain calibration curves for a venturi meter and orifice meter and determine head losses
Pipe Friction Apparatus	To study laminar and turbulent flow in pipes to determine variation of friction factor with Reynolds number
Energy losses in pipe networks	To study the loss of energy in pipe networks due to bends, expansions and contractions
Hydrostatic Pressure Apparatus	To determine the centre of pressure of fully and partially submerged plane surfaces
Pressure Gauge	To calibrate a Bourdon pressure gauge
V-Notch	To study flow through notches and determine the coefficient of discharge for a V-notch
Pontoon Apparatus	To determine the metacentric height and the metacentre of a floating vessel
Forced Vortex Apparatus	To study the characteristics of forced vortex motion
Infiltrometer	To measure in-situ the infiltration rate of soils
Open Channel Flow- tilting Flume	To study the characteristics of open channel flow, behaviour of gates, weirs, spillways etc. and to study the wave propagation in shallow waters
Ground Water Flow Analysis	To determine the distribution of ground water head and flow in aquifers
HEC-RAS	To model and study a river reach and its flood plain
Water CAD Software	To model water distribution
Culvert Master Software	To analyse and design culverts
Hydraulic Ram Pumps	To study the hydraulic transients
Pump/Turbine Apparatus	To study performance characteristics of pump/turbine
MIKE21 HD and Wave models	To model nearshore hydrodynamics and wave transformation



Hydraulic Engineering Laboratory

2.6.12 HIGHWAY ENGINEERING LABORATORY

Lecturer in Charge	:	Dr. H. R. Pasindu
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Technical Officer in Charge : Mrs. G. K. Wijekon

Equipment	Application		
Accelerated Polishing Machine	Conduct polished stone value test to establish friction deterioration levels of aggregates		
Concrete Abrasion Resistance Machine	Evaluate the resistance of concrete for abrasion		
Vehicle Bump Indicator	To determine the road roughness using a vehicle - mounted roughness measurement unit (Class III type)		
Z-250 Reference Profiler	Roughness Calibrating Machine, used to calibrate the bump integrator and pavement profile of small sections		
British Pendulum Test Machine	Measure pavement fiction coefficient		
CBR Test Machine Dynamic Cone Penetrometer (Field CBR)	Laboratory test of CBR values of soil samples To determine rapid in-situ measurements of the structural properties of road pavements. Penetrometer constructed with unbound materials, TRL (Transportation Research Laboratory) Road Note 31:1993		
Sand Equivalent Test	For determining the theoretical maximum specific gravity of uncompacted bituminous paving mixtures & the percent air voids in compacted bituminous mixtures and the amount of bitumen absorbed by aggregates.		
Aggregate Impact Value (AIV) Test Equipment	To determine the toughness of aggregates		
HDM4	Pavement Management Software for life cycle cost analysis for pavement		

2.6.13 TRAFFIC ENGINEERING LABORATORY

: Prof. J. M. S. J. Bandara Lecturer in Charge

Technical Officer in Charge : Mrs. G. A. N. Gurusinghe

Equipment	Application
Manual Traffic Counters	Traffic Counts, Turning Movement Counts
Radar Guns	Speed Surveys
Global Positioning System	Highway Inventories, Transport Operations, Vehicle Tracking
Precision Odo-Meter	Distance Measurements
Vehicle Installed Back Lighted Distance Measuring Instrument	Distance Measurements
Trazer Automated Traffic Counting Software	Traffic counting
CUBE	Transport planning
Trans Plan V3	Traffic Forecasting, Transport Planning

2.6.14 ROAD SAFETY & INTELLIGENT TRANSPORTATION SYSTEMS LABORATORY

Lecturer in Charge	:	Dr. G. L. D. I. De Silva
	•	

Technical Officer in Charge : Mrs. G. A. N. Gurusinghe

Software Package	Application
Revised MAAP by UoM	Accident data recording and analysis
Blink 2005	Traffic Signal Design
VISSIM	Micros-simulation traffic modelling software

2.6.15 Advanced Bitumen Testing Laboratory

Lecturer in Charge	:	Prof. W. K. Mampearachchi
Technical Officer in Charge	:	Mr. U. K. Padmaperuma

Equipment	Application
Kinematic Viscometer	To determine the Kinematic Viscosity of liquid asphalt (bitumen), road oils and distilled residues of liquid asphalts at 600 C and for asphalt cement at 1350 C
Centrifugal Extractor	To determine bitumen in hot mixed paving mixtures and pavement samples.
Marshall Tester	To design asphalt concrete mixes ASTM D 1559:89
Softening Point Apparatus	To determine the softening point of asphalt ASTM D36:76
Rice Test Apparatus	Density measurement of asphaltic mixtures
Flash Point Tester	To determine the point of the bituminous binder
Saybolt Viscosity Set	For measuring the Saybolt viscosity of bituminous emulsion ASTM D 244-89
Penetration Set	The penetration of bituminous binder ASTM DS: 86
Solubility Set	To determine the purity of asphalt cement.
Ductility Set	To measure ductility on a representative portion of Bitumen = ASTM DI 13: 86
Residue by Distillation Set	Quantitative determination of residue and oil distillate in asphalt emulsion ASTM D 244:89
Asphalt Binder Analyser	To estimate the bitumen content of Asphalt
Rotary evaporator	To recover asphalt from a solvent
Thin film oven	To determine the effects of heat and air on a film of semisolid asphaltic material



Highway Engineering Laboratory



Traffic Engineering Laboratory



Road Safety and ITS Laboratory







Advanced Bitumen Testing Laboratory

2.6.16 SURVEYING LABORATORY

:

:

Lecturer in Charge

Mr. T. D. C. Pushpakumara

Technical Officer in Charge

Mr. H. S. Hettiarachchi

Equipment	Testing Facilities	Software Facilities Available
Global Positioning System,	Facilities available for :	AutoCAD
Receivers	Chain Surveying	Pythagoras
Laser Total Station	Levelling	ArcGIS
Total Station Instruments	Prismatic Compass Survey	ERDAS
Digital Theodolite	Theodolite Traverse Survey	Surfer 8
Electronic Theodolite		
Optical Theodolite	Traverse Sheet Calculation	
Vernier Theodolite	Tachometry Surveys	
Cradle Theodolite	Plane Table Surveying	
Micro-optic Theodolite	Triangulation Surveys	
Instructional Theodolite	Surveying with Total Station	
Precise Level	Surveying with Global	
	Positioning System	
Automatic Level	Computer generated survey	
	plans	
Digital Level		
Engineers Level	Civil engineering setting-out	
	works	
Dumpy Level		
Self-Reducing Alidades		
Self-Reducing Tachometers	Survey camp of two weeks	
	duration for Civil	
	Engineering Students.	
Sextants		
Stereoscope		
Subtense Bar		
Distance Measuring Wedges		
Invar Tape		
Invar Staves		
Multimedia		
Photocopy Machine		
Digital Camera		
Personal Computers		
Chain		
Tapes(linen/ steel)		
Accessories for basic		
surveying work		

CIVIL ENGINEERING STUDENT HANDBOOK 2020







Surveying

2.7 RESOURCES

2.7.1 COMPUTER UNIT OF THE DEPARTMENT OF CIVIL ENGINEERING

:	Dr. R. L. H. L. Rajapakse
:	Mr. C. H. Satharasinghe
	Mrs. V. P. Wickramatunga
:	Mr. K. W. T. Isanka
:	Mrs. A. P. Kandage
	: : :

Resources and Services Provided

- Servers: File Server for Staff and Students Two Printer Servers DHCP Server DNS Server for the Department Backup Server SSH Server WiFi Access points for the Department
- **High speed internet and email connectivity** with a fiber optic backbone Wireless Access Points for Staff and Students
- Network Printer for Academic and Non-Academic staff, Research staff, and Research students
- Student Area for Undergraduates has 60 computers with internet facilities.
- Services: Lab classes for Computer Applications in Civil Engineering for undergraduate and postgraduate Students

Distributing Popular Civil Engineering Software/ Software Licences for Staff and Students

Multimedia communication facilities for undergraduates to enhance their communication skills

Internet, email, Printing, Scanning, DVD Copy Facilities

Maintain Computers and the Computer Network of the Department of Civil Engineering

Maintain Departmental Website

Moodle Content Development

E-Learning Website Development for Undergraduates





Computer Resource Unit

2.7.2 CIVIL ENGINEERING WORKSHOP

Lecturer in charge	:	Dr. K. Baskaran
Technical Officer	:	Mr. D. M. N. L. Dissanayaka

The following workshop facilities are available for teaching, research and development activities of the department.

- Upright drill machine
- Bench drill machine
- Radial drill
- Milling machine
- Lathe machine
- Bench Grinder
- Shaping Machine
- Surface grinding Machine
- Arc welding plant
- Power Hack saw Machine
- Hand shearing Cutter
- Gas cutter
- Air Compressor



Civil Engineering Workshop

2.8 STUDENT COMMON ROOMS

The Student Common Room of the Department of Civil Engineering has an approximate area of 250 m^2 with furniture, lighting and fans; which provide an area for studying. Students have access to this facility from 8.00 a.m. to 8.00 p.m. on all working days and at weekends.

2.9 WORKING HOURS AND ACCESS TO FACILITIES

All Laboratories are open on all working days. Students can use them during the allocated practical sessions. The facilities can also be used for research and development related activities.

The computer resources unit is open on all working days and on Saturdays.

3 CIVIL ENGINEERING DEGREE PROGRAMME

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3. CIVIL ENGINEERING DEGREE PROGRAMME

3.1 STRUCTURE OF THE DEGREE PROGRAMME

Course Title	: Honours Degree of Bachelor of the Science of Engineering	
Abbreviated Title	: B Sc Eng Hons	
Field of Specialisation	: Civil Engineering	
Course Duration	: 4 years (8 semesters)	
Medium of Instruction	: English	
Annual Intake	: 125 st	udents
Minimum Credit Requi	rement	:137 GPA credits* and 14 Non-GPA credits.
		Total of 151 credits
		Students are encouraged to take a minimum of 12 credits from elective courses in Semesters 7 and 8.

* a credit reflects 14 hrs of lectures or 42 hrs of laboratory, tutorial or field work

The Department of Civil Engineering also allow the students an opportunity to obtain skills in Entrepreneurship either by taking a minor in Entrepreneurship or by gaining skills by taking few recommended optional subjects related to Entrepreneurship. Those who take the minor in Entrepreneurship will have to gain extra six credits by following optional or elective subjects recommended while gaining a total of 13 credits needed for the minor from the specified subjects. Hence, a student opting for a minor in Entrepreneurship will have to take a total of 156 credits to obtain B.Sc. in Civil Engineering along with a minor.

3.1.1 FEATURES

- A degree programme that covers the basics of the entire field of Civil Engineering, while allowing students to specialise in a narrower sub-discipline if they so wish;
- A curriculum that enables students to acquire knowledge, understanding and transferable skills (both intellectual and practical);
- A flexibility in the programme that allows students to make their own choices and become responsible for their customised curricula and also familiar with state-of-the-art tools and practices
- An environment that prepares students for the world of work, self-learning and life-long learning
- Close interaction between students and academic staff
- Assessment schemes that seek to achieve the Programme Outcomes while ensuring the gaining of desirable graduate attributes

3.1.2 VISION OF THE GRADUATE PROFILE

It is expected that Civil Engineers on graduation should have acquired the knowledge, skills and attitudes to carry out a range of activities, required of them in the modern world.

In line with the International Engineering Alliance Graduate Attribute profile required for Washington Accord accreditation, a Civil Engineering graduate of University of Moratuwa is expected to have the following attribute profile:

- 1. Engineering Knowledge Be able to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to the solution of complex civil engineering problems
- 2. Problem Analysis Identify, formulate, research literature and analyse complex civil engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- 3. Design and development of solutions Design solutions for complex civil engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- 4. Investigation Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
- 5. Modern Tool Usage Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex civil engineering activities with an understanding of the limitations.
- 6. The Engineer in Society Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
- 7. Environment and Sustainability Understand the impact of professional civil engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
- 8. Ethics Apply ethical principles and commit to professional ethics and responsibilities and norms of civil engineering practice.
- 9. Individual and Teamwork Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.
- 10. Communication 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.
- 11. Project Management and Finance Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a

member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong Learning - Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

The Civil Engineering programme at the University of Moratuwa has been developed so that these desired graduate attributes could be achieved through the learning outcomes of the curriculum. The present curriculum has been revised to conform to the accreditation requirements of Civil Engineering Graduates as specified by the Institution of Engineers, Sri Lanka, Washington Accord and the Joint Board of Moderators (including the Institution of Civil Engineers) Engineering Council, United Kingdom.

Thus, recently graduated Civil Engineers must be technically competent and be able to solve problems having first identified and formulated the problem. They must be able to apply the knowledge of mathematics, science and engineering and use systems approaches to design and operational performance. They must be able to work as individuals as well as team members. They should be capable of effective communication. They must understand the social, cultural, global and environmental responsibilities of the professional engineer. They must be aware of the need for sustainable development and also understand the principles of sustainable design and development. They must understand their professional and ethical responsibilities and the commitment to them. They are also expected to continue their professional development by cultivating lifelong learning skills.

3.1.3 **PROGRESSION IN CURRICULUM**

Pre Academic Term and First Semester – focuses on mathematics and mechanics, and also on acquiring a broad engineering base, inclusive of IT and Computer Science. The importance of communication skills is also stressed.

Subjects specific to the field of Civil Engineering such as Structural Mechanics, Fluid Mechanics and Soil Mechanics are included in the next two semesters (2 and 3) while strengthening the mathematics and mechanics base. In addition, you will be introduced to the fundamentals of some subjects that will be learnt at greater depth later in the course, like Project Planning, Cost Estimating, Environmental Engineering, Transportation Engineering, and also Surveying and Geology, which are useful for Civil Engineers. These subjects form the base for all civil engineering applications. Commencing in Semester 3, you will be learning the design principles in most of the major areas of Civil Engineering, especially in the design courses. Towards the end of your programme, you will take courses in Economics and Management, because all engineers are managers of one sort or another. As part of some of these subjects, you will have the opportunity to visit several sites of Civil Engineering interest.

The period of Industrial Training is when you will experience the Civil Engineering world ranging from muddied boots to managers' board rooms (soon after Semester 5). You will have a taste of your future career. Just prior to the commencement of semester 6, you will participate in a survey camp away from the University

environment, where you will carry out projects based on surveying applications using a variety of techniques. You will again experience the 'real world' encountering social, environmental, safety, risk and sustainability issues and economic constraints beyond the familiar learning environment.

Management and design related subjects are strengthened further in the final three semesters (6, 7 and 8). A wide variety of specialised applications are also included as elective subjects. You can choose electives according to your preference. The electives cover virtually all the areas of Civil Engineering, namely Structural, Construction, Hydraulic, Geotechnical, Environmental and Transportation Engineering.

These three semesters also provide you with an exposure to and simulate real world environments through Research Projects and the Comprehensive Design Projects. These activities are aimed at making you a confident professional, who will be able to take up the challenges of the real world you would face at the end of your undergraduate studies, and contribute to the development of the country that nurtured you and the world that all of us live in.

In the Comprehensive Design Project (CDP), you will be given a brief, and requested to prepare the proposal, carry out pre-feasibility and feasibility studies, and provide the preliminary designs, detailed designs, tender documents and computer based drawings. In this activity, you will be working in teams of about 10, where you will learn the importance of social, environmental and economic aspects of projects, in addition to the technical aspects. The staff will give you minimum guidance in this, and most of the time your team will work independently finding the necessary information from various sources. In CDP, your individual performance and the performance of the group will be assessed.

You must also complete a Research Project on an individual basis under the direct supervision of a senior staff member where you will be trained to tackle unfamiliar problems through creative and systematic work to increase the knowledge gathered.

The Department of Civil Engineering also provides an opportunity to gain entrepreneurial skills by permitting students to follow a range of subjects relating to Entrepreneurship.

Details of the curriculum and subject modules are described under the section-Description of Modules. All taught subject modules are assessed by continuous assessments and end of semester written examinations. The continuous assessment component ranges from 20% to 100% depending on the subject module. You will be provided a course outline at the beginning of the semester indicating details pertinent to each subject module. A minimum requirement must be achieved in both continuous assessment and written examination in order to successfully complete a subject module.

An innovative feature of the Civil Engineering Programme is the Mentoring Programme that is conducted over a period of about three months. The programme is conducted in two phases. Guest lectures are delivered by specialists on relevant topics during the first phase while in the next phase; a mentor meets with a group of about ten students once a week for seven weeks. Most students meet their mentors away from the University, where they are exposed to a totally different environment, often a private sector office. This opportunity enables you to develop personal confidence and enhance other skills needed to perform in a modern work environment and you will benefit significantly from the programme. The Department has pioneered this feature and is proud of its success. It greatly values the commitment of the mentors who give of their time voluntarily amidst busy schedules to inspire the students and be their role models. At the end of each programme the students themselves organise an event in which they demonstrate their appreciation and gratitude to their mentors.

3.1.4 COORDINATION OF SPECIFIC ACTIVITIES OF THE B.SC. ENGINEERING DEGREE COURSE

Academic Co-ordinator (Semester 1) Mr. A. H. R. Rathnasooriya Academic Co-ordinator (Semester 2) Dr. (Mrs.) J. C. P. H. Gamage Academic Co-ordinator (Semester 3) Prof. M. W. Jayaweera Academic Co-ordinator (Semester 4) Dr. T. M. N. Wijayaratna Academic Co-ordinator (Semester 5) Prof. W. K. Mampearachchi Dr. K. Baskaran Academic Co-ordinator (Semester 6) Academic Co-ordinator (Semester 7) Prof. J. M. A. Manatunge Prof. S. A. S. Kulathilaka Academic Co-ordinator (Semester 8) Dr. K. Baskaran Industrial Training (Semester 6) Research Projects (Semesters 6, 7 & 8) Prof. J. M. S. J. Bandara Comprehensive Design Projects (Semesters 7 & 8) Prof. (Mrs.) C. Jayasinghe Prof. M. T. R. Jayasinghe Survey Camp (Semester 6) Prof. U. G. A. Puswewala Prof. M. W. Jayaweera Dr. U. P. Nawagamuwa Mr. T. D. C. Pushpakumara

3.2 EXAMINATIONS AND ASSESSMENT STRATEGY

All subject modules are assessed by continuous assessments based an Outcome Based Education (OBE) philosophy and final examinations. Allocation of marks for final examination and continuous assessment for each subject module will be different, depending on the subject module, and this will be given to students in the course outline at the beginning of the semester. Students should have minimum of 80 % attendance to be eligible for the final examination. Students with illness or any other valid reason for their inability to attend lectures should bring a medical certificate from a recognized medical officer or a letter describing the problem they had. All students should also satisfy the minimum requirement for both continuous assessment and final examination of a particular subject in order to pass. All the continuous assessment assignments

should be submitted before the specified deadlines. Marks will normally be deducted for late submissions.

3.3 MENTORING PROGRAMME

The primary objective of the mentoring programme is to produce graduates with skills and attitudes that would be sought after by the industry. Accordingly, the focus is broadly on areas such as development of personality, communication skills, positive attitudes, leadership, teamwork, career search skills and personal grooming.

The mentoring programme is conducted over a period of approximately fourteen weeks. The first half of the programme is carried out in the form of guest lectures delivered by specialists on relevant topics. During the next phase, a mentor meets with a group of about ten students once a week for seven weeks. On most occasions, students meet with their mentors away from the University, where they experience exposure to a totally different environment, often a private sector office. This enables students to further develop their personal confidence and enhance other skills needed to perform in a modern work environment. The programme is personalized and lasts long enough to begin a process of change in the students. It is also anticipated that the close relationship mentors develop with students will help them in their future career search.

Most students benefit significantly from the programme and would recommend it to their juniors. The selected mentors give of their time voluntarily and sacrificially amidst heavy schedules. The commitment of the mentors has been a source of inspiration to students and their contribution is greatly appreciated.

Name of the Award	Awarded to
Gold Medal in Civil Engineering	The Civil Engineering Graduand who obtains the highest overall Grade Point Average of 3.8 or above at the B.Sc. Engineering Degree Examination donated by Deshabandu Dr. A. N. S. Kulasinghe
Special Award for Academic Excellence in Civil Engineering	The Civil Engineering Graduand who obtains the 2 nd highest overall Grade Point Average 3.7 and above at the B.Sc. Engineering Degree Examination
Special Award for Academic Excellence in Civil Engineering	The Civil Engineering Graduand who obtains the 3 rd highest overall Grade Point Average 3.7 and above at the B.Sc. Engineering Degree Examination
Comprehensive Design Project Award in Civil Engineering	Awards to be made to the 10 best students, based on a marking scheme for performance in the Comprehensive Design Project

3.4 AWARDS

Name of the Award	Selection Criteria
	The Civil Engineering Student who obtains the highest Grade Point Average of 3.7 and above at the first attempt for the specified Building and Structural Engineering subjects.
Building and Structural Engineering Award*	The specified subjects are: CE 1112 – Structural Mechanics I CE 2012 – Structural Mechanics II CE 2112 – Structural Analysis I CE 2022 - Design of Steel Structures CE 2122 – Design of Concrete Structures I CE 3112 – Structural Analysis II CE 3122 - Design of Masonry and Timber Structures CE 4012 – Design of Concrete Structures II and
	Any one of the following subjects CE 4312 – Building Engineering CE 4442 - Computational Mechanics CE 4412 – Bridge Engineering CE 4432 – Design of Large Structures
	The Civil Engineering Student who obtains the highest Grade Point Average of 3.7 and above at the first attempt for the specified Construction Engineering subjects.
Construction Engineering and Management Award*	The specified subjects are: CE 1132 – Building Construction and Materials CE 2052 - Construction Planning and Cost Estimation CE 3142– Construction Management CE4112 – Management Skills Development CE4123 – Engineering Economics and
	Any one of the following subjects CE 4342 – Construction Technology CE 4492 – Project Management
	The Civil Engineering Student who obtains the highest Grade Point Average of 3.7 and above at the first attempt for the specified Environmental Engineering subjects.
Environmental Engineering Award*	The specified subjects are: CE3152 – Fundamentals of Environmental Engineering CE4052 – Environmental Engineering and
	Any three of the following subjects CE4552– Water and Wastewater Treatment CE4562 – Environmental Impact Assessment CE4472– Environmental Geotechnics CE4522 – Sustainable Design and Construction

Name of the Award	Selection Criteria	
	The Civil Engineering Student who obtains the highest Grade Point Average of 3.7 and above at the first attempt for the specified Geotechnical Engineering subjects.	
Geotechnical Engineering Award*	The specified subjects are: CE 2042 – Soil Mechanics and Geology I CE 2132– Soil Mechanics and Geology II CE 3132 Geotechnical Engineering CE 4032 – Geotechnical Design and	
	Any two of the following subjects CE 4332 – Remote Sensing and GIS CE 4472– Environmental Geotechnics	
	CE 4482 – Computational Geotechnical Engineering	
	The Civil Engineering Student who obtains the highest Grade Point average of 3.7 and above at the first attempt for the specified Hydraulic Engineering subjects.	
Hydraulic Engineering Award*	The specified subjects are: CE 1122 Fluid Mechanics II CE 2032 Hydraulic Engineering I CE 3012 Hydraulic Engineering II CE 4022 – Hydraulic Design and	
	Any one of the following subjects CE 4322 – Irrigation Engineering CE 4452 – Costal and Port Engineering	
	The Civil Engineering Student who obtains the highest Grade Point Average of 3.7 and above at the first attempt for the specified Transportation Engineering subjects.	
Transportation Engineering Award*	The specified subjects are: CE 3162 – Fundamentals of Transportation Engineering CE 4042 – Highway Design and	
	Any three of the following subjects CE 4352 – Traffic Engineering and Planning CE 4542 - Analysis and Design of Transportation Systems CE 4532– Highway Construction and Maintenance Management CE 4332 – Remote Sensing and GIS	
* Can be subjected to change as per senate approval		

4 CURRICULUM AND MODULES

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4. CURRICULUM AND MODULES

4.1 CURRICULUM

Curriculum of B.Sc. Engineering Honours Degree Programme Department of Civil Engineering

Modulo	Iodule		Locturos	Lab/	Cr	edits	No	orm	Evaluation	
Code	Module Name	Category	hrs/week	Assignments hrs/week	GPA	NGPA	GPA	NGPA	CA%	WE%
Semester 1										
MA1013	Mathematics	С	3.0	1/1	3.0				20	80
CS1032	Programming Fundamentals	С	2.0	3/1	3.0				20	80
ME1032	Mechanics	С	2.0	3/4	2.0				20	80
MT1022	Properties of Materials	С	2.0	3/4	2.0				20	80
CE1022	Fluid Mechanics	С	2.0	3/4	2.0				20	80
EE1012	Electrical Engineering	С	2.0	3/4	2.0				20	80
EL1012	Language Skill Enhancement I	С	-	3/1	1.0				20	80
MN1012	Engineering in Context	C	1.0	-		1.0	15.0	1.0	30	70
				Tot	tal for Se	emester 1	15.0	1.0		
Semester 2					-	1	-	-	-	r
MA1023	Methods of Mathematics	С	3.0	1/1	3.0				30	70
CE1112	Structural Mechanics I	С	2.5	3/2	3.0				30	70
CE1122	Fluid Mechanics II	C	2.5	3/2	3.0				30	70
CE1132	Building Construction and Materials	C	2.0	3/1	3.0				30	70
ME1812	Basic Thermal Sciences	C	2.0	-	2.0				30	70
EL 1022	Language Skill Enhancement II	С	-	3/1	1.0		15.0	0.0	20	80
DE2XXX	Humanities Electives 1	E	2.0	-	2.0		2.0	0.0	100	-
CS2850	Visual Programming and Applications	E	1.0	3/1		2.0			100	-
CE2260	Building Design Process & Applications	E	1.0	3/1		2.0	0.0	2.0	30	70
MN1030	Entrepreneurship Skill Development (continuing)	E	0.5	3/2		1.0			70	30
				Tot	tal for Se	emester 2	17.0	2.0		

Modulo		Lectures Lab/ Ci		Cr	edits	Norm		Evaluation		
Code	Module Name	Category	hrs/week	Assignments hrs/week	GPA	NGPA	GPA	NGPA	CA%	WE%
Semester 3										
MA2013	Differential Equations	С	2.0	-	2.0				30	70
MA2023	Calculus	С	2.0	-	2.0				30	70
CE2013	Structural Mechanics II	С	2.5	3/2	3.0				30	70
CE2022	Design of Steel Structures	С	2.0	3/1	3.0				30	70
CE2032	Hydraulic Engineering I	С	2.5	3/2	3.0				30	70
CE2042	Soil Mechanics & Geology I	С	2.0	3/1	3.0				30	70
CE2052	Construction Planning & Cost Estimating	С	2.0	3/1	3.0				30	70
CE2062	Surveying I	С	2.0	3/1	3.0				30	70
MN1030	Entrepreneurship Skill Development (continuing from S2)*	Е	0.5	3/2		1.0	22.0	0.0	70	30
				Tot	tal for Se	emester 3	22.0	0.0		
Semester 4										
MA2033	Linear Algebra	С	2.0	-	2.0				30	70
MA3013	Applied Statistics	С	2.0	-	2.0				30	70
CE2113	Structural Analysis I	С	2.5	3/2	3.0				30	70
CE2122	Design of Concrete Structures I	С	2.0	3/1	3.0				40	60
CE3012	Hydraulic Engineering II	С	2.5	3/2	3.0				30	70
CE2132	Soil Mechanics & Geology II	С	2.0	3/1	3.0				30	70
CE2142	Surveying II	С	2.0	3/1	3.0		19.0	0.0	30	70
DE2XXX	Humanities Electives II	E	2.0	-	2.0		2.0	0.0	100	-
MN 2010	Entrepreneurial Leadership*	0	1.5	3/2	2.0				50	50
				To	tal for Se	emester 4	21.0	0.0		

* - only for students specialising in entrepreneurship minor

Modulo		Lectures Lab/ Credits			Norm		Evaluation			
Code	Module Name	Category	hrs/week	Assignments hrs/week	GPA	NGPA	GPA	GPA	CA%	WE%
Semester 5										
CE3112	Structural Analysis II	С	2.5	3/2	3.0				50	50
CE3122	Design of Masonry & Timber Structures	С	2.0	3/1	3.0				40	60
CE3132	Geotechnical Engineering	С	2.5	3/2	3.0				30	70
CE3142	Construction Management	С	2.5	3/2	3.0				30	70
CE3152	Fundamentals of Environmental Engineering	С	1.5	3/2	2.0				30	70
CE3162	Fundamentals of Transportation Engineering	C	1.5	3/2	2.0				40	60
MN3042	Business Economics & Financial Accounting	C	3.0	-	3.0		19.0	0.0	30	70
MN3010	Multidisciplinary Design, Innovation & Venture Creation	0	1.5	3/2	2.0				50	50
		•	•	Tot	tal for Se	mester 5	19.0	0.0		
Industrial T	Fraining & Survey Camp				Ū.					
CE3992	Industrial Training	С	-	-		6.0			100	-
CE3913	Survey Camp	С	-	-		2.0	0.0	8.0	100	-
			Total for In	dustrial Training	g & Surv	ey Camp	0.0	8.0		
Semester 6										
CE4012	Design of Concrete Structures II	С	2.0	3/1	3.0				30	70
CE4022	Hydraulic Design	С	2.5	3/2	3.0				30	70
CE4032	Geotechnical Design	С	2.5	3/2	3.0				30	70
CE4902	Communication Skills for Projects	С	1.0	3/1		2.0			100	-
CE4922	Research Project (Continuing)	С	-	3/1	1.0		10.0	2.0	100	-
				Tot	tal for Se	emester 6	10.0	2.0		
Semester 7										
CE4042	Highway Engineering	C	2.5	3/2	3.0				30	70
CE4052	Environmental Engineering	C	2.5	3/2	3.0				40	60
CE4912	Comprehensive Design Project (Continuing)	C	-	3/1	2.0				100	-
CE4922	2 Research Project (Continuing) C			6/1	2.0				100	-
MN4900	Professional Ethics C 1.0 - 1.0				1.0	10.0	1.0	30	70	
CE4312	Building Engineering	E	2.0	3/1	3.0				40	60

Modulo		Lectures		Lab/	Credits		No	orm	Evalı	ation
Code	Module Name	Category	hrs/week	Assignments hrs/week	GPA	NGPA	GPA	NGPA	CA%	WE%
CE4322	Irrigation Engineering	Е	2.5	3/2	3.0				30	70
CE4332	Remote Sensing & GIS	Е	2.5	3/2	3.0				50	50
CE4342	Construction Technology	Е	2.0	3/1	3.0				40	60
CE4352	Traffic Engineering & Planning	E	2.5	3/2	3.0				30	70
MN3020	Entrepreneurship Business Basics	Е	2.0	3/1	3.0		6.0	1.0	50	50
				Tot	al for Se	mester 7	16.0	1.0		
Semester 8										
CE4112	Management Skill Development	С	2.0	-	2.0				30	70
CE4123	Engineering Economics	С	2.0	-	2.0				30	70
CE4912	Comprehensive Design Project	С	-	6.0	3.0				100	-
CE4922	Research Project	С	-	3.0	1.0		8.0	0.0	100	-
CE4412	Bridge Engineering	E	2.0	3/1	3.0				40	60
CE4422	Advanced Structural Engineering & Design	Е	2.0	3/1	3.0				40	60
CE4432	Design of Large Structures	E	2.5	3/2	3.0				40	60
CE4442	Computational Mechanics	E	2.5	3/2	3.0				40	60
CE4452	Coastal & Port Engineering	E	2.5	3/2	3.0				30	70
CE4472	Environmental Geotechnics	E	2.0	3/1	3.0				30	70
CE4482	Computational Geotechnical Engineering	E	2.0	3/1	3.0				50	50
CE4492	Project Management	E	2.0	3/1	3.0				30	70
CE4502	Management Information Systems	Е	2.0	3/1	3.0				30	70
CE4522	Sustainable Design & Construction	E	2.0	3/1	3.0				40	60
CE4532	Highway Construction & Maintenance	Б	2.5	3/2	3.0				40	60
	Management	Ľ	2.3	5/2	5.0				40	00
CE4542	Analysis & Design of Transportation Systems	E	2.5	3/2	3.0				40	60
CE4552	Water & Wastewater Treatment	Е	2.5	3/2	3.0				40	60
CE4562	Environmental Impact Assessment	E	2.0	3/1	3.0		9.0	0.0	40	60
MN4010	Business Plan Development	0	1.5	3/2	2.0				70	30
				Tot	al for Se	mester 8	17.0	0.0		
	Total for the P		137.0	14.0						

The minor will consist of the following: This will give a total of 13 credits for the student to qualify for the minor. Six of these will come from optional subjects.

- MN 1030 2 NGPA E
- MN 2010 2 GPA O
- MN 3010 2 GPA O
- MN 3020 3 GPA -E
- CE 4123 2 GPA C
- MN 4010 2 GPA O

Modules Offered to Other Fields of Specialisation

Madula				Lab/	Credits		Eval	uation
Codo	Module Name	Category	Lectures	Assignments				
Coue			hrs/week	hrs/week	GPA	NGPA	CA%	EX%
Semester 3								
CE1812	Mechanics of Materials	0	2.0	-	2.0		30	70
CE1822	Aspects of Civil Engineering	0	2.0	-	2.0		30	70
Semester 5								
CE2812	Soil Mechanics	0	2.5	3/2	3.0		30	70

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4.2 DESCRIPTION OF MODULES – CIVIL ENGINEERING

r	-1	T									
Module Code	CE1022	Module Title	Fluid Mechanics I								
Credits	2.0	Hours/Wook	Lectures	2.0	Dre/Co. ro	aniaitaa	ME1022				
GPA/NGPA	GPA	HOULS/ WEEK	Lab/Assignments	3/14	r1e/C0-1e	quisites	WIE1032				
Module Type:	Core Mod	ule/Compulsory	▼ E	Elective		Optional					
Learning Outco After completing	omes (LOs) g this module,	, students should b	be able to:								
LO-1: <i>define</i> the engineeri	e properties of ng practice,	fluids and describ	be the significance of su	ich prope	erties in appli	cations i	n				
LO-2: <i>determine</i> and stabil	e hydrostatic f lity such surfa	orces on submerg ces/bodies in appl	ed surfaces/ bodies and ications in engineering	assess tl practice,	he conditions , and	for equi	librium				
LO-3: <i>apply</i> the concepts of conservation of mass, energy and momentum of fluids and <i>determine</i> the velocities, pressures, flow rates, forces, etc., in applications in engineering practice.											
Module Outline	Module Outline LOs Covered										
Introduction [1 Applications of j mechanics	troduction [1 h] plications of fluid mechanics in engineering practice, historical development of fluid echanics										
Characteristics <i>Characteristic b</i> <i>weight, relative</i>	/ Properties of fl behaviour of fl density, visco	of Fluids [1 h] uids, continuum c sity, compressibili	oncept, properties of fli ity, surface tension, vap	uids: den or pressi	sity, specific ure]	LO-1				
Fluid Statics [1 Hydrostatic pre absolute and ga pipes; Hydrosta diagram; Buoya stability of fully relative equilibr	2 h] ssure: govern uge pressures utic thrust: h ncy: upthrust submerged an ium of fluids i	ning equation, va , pressure head, n ydrostatic thrust on submerged bod of floating bodies, under linear accel	riation of pressure, pi neasurement of pressur on plane and curved lies, Archimedes princip effect of liquid cargo; F eration, forced vortex n	iezometri e, pressu surface ple, equit Relative e notion	ic pressure, re rating of s, pressure librium and equilibrium:	J	LO-2				
Fluids in Motio Introduction to visualization; C applications; C applications; C applications	n [10 h] fluid flow: Conservation onservation of Conservation	characteristics of mass: contin f energy: Bernoul of momentum:	of fluid flow, flow nuity equation for in li's equation, steady flo steady flow force-ma	classifico compres ow energ omentum	ation, flow sible flow, y equation, e equation,	1	_0-3				
Introduction to Introduction to turbines, operat	• Hydraulic m hydraulic mac ing conditions	hachinery [4 h] hinery: classificat s of pumps	tion of hydraulic machi	nery, pur	nps and]	20-3				
Practical Work											
1. Stability	of a rectangul	ar pontoon				I	LO-2				
2. Forced ve	ortex motion ((demonstration)				1	LO-2				
	Category		Туре	As	sessed LOs	W	eightage				
Assessments	СА	Coursework on Stability of a rec	laboratory practical: ctangular pontoon		LO-2		20%				
	WE	End Semester E	xamination	All 80%							
		-									

Recomme Textbook	ended s		1. 2. 3. 4.	 Revised edition (SI Units). McGraw-Hill Publishing Co. Hamill, L. (2001). Understanding Hydraulics, (3rd ed.), Palgrave Macmillan Publishers. Douglas, J. F., Gasiorek, J. M., and Swaffield, J. A. (2000). Fluid Mechanics (4th ed.). Prentice Hall Publishers. Massey, B. S. (1998). Mechanics of Fluids (7th ed.). Chapman & Hall. Mr. A. H. R. Rathnasooriya, Dr. P. K. C. De Silva, Dr. R. L. H. L. Rajapakse 									
Names of	Lecture	ers	Mr. 4	A. H. R. I	Rathnasc	ooriya, D	r. P. K. (C. De Sil	va, Dr. I	R. L. H. I	Rajapa	ıkse	
Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
I.O-1	L	102	105	104	105	100	107	100	107	1010	1011	1012	
10-2	I	T											
LO-3	M	L	L	L						1		L.	
Module	M	L	L										
S	cale:	H – High M – Medium L – Low											

Module Code	CE1112	Module Title	Definition of the structural Mechanics I								
Credits	3.0	Hound	Lectures		2.5	Duo noquiait		ME1022			
GPA/NGPA	GPA	Hours/ week	Lab/Assign	ments	3/2	Pre-requisit	.es	ME1032			
Module Type:	Core Modu	ile/Compulsory	V	Electiv	ve 🗖	(Optior	nal			
Learning Outco After completing	mes (LOs) this module,	students should b	e able to:								
LO-1: examine d	lifferent types	of structural and	material behav	viour und	er diffe	erent types of a	ction	s,			
LO-2: compute v	arious types of	of stresses and def	formations in c	letermina	te struc	ctures,					
LO-3: apply thei	r knowledge t	o solve practical j	problems invo	lving stru	ctural l	behaviour, and	l				
LO-4: <i>design</i> , <i>fau</i> capacity a	<i>bricate</i> (and s nd material us	ubsequently <i>test</i>) sage, based on the	within a group ir understandi	o, a simpl ng of stru	e struct	ture that optim behaviour.	izes l	oad carrying			
Module Outline							L	Os Covered			
Bending stresser Theory of bendin moment of resist	s [8 h] eg, application ance, derivati	ıs in uni-axial and on of bending for	l biaxial cond mula	itions, co	mposite	e sections and	Ι	LO-1, LO-2 LO-3			
Transverse shea <i>Horizontal and v</i>	ar stresses [6 vertical shear	h] stress distribution	, location of s	hear cen	tre, des	ign of rivets	Ι	LO-1, LO-2 LO-3			
Torsion [4 h] Torsion of circul	ar sections, h	ollow cylinders ar	nd tapering sh	afts			Ι	LO-1, LO-2 LO-3			
Deflection of be Differential equa to simple statical	Deflection of beams [8 h] LO-1, LO-2 Differential equation of flexure, Macaulay's method and moment-area method, introduction to simple statically indeterminate beams LO-1, LO-2										
Theory of colum Core of a short of	nns and strut	s [9 h] 1, buckling of stru	ts in long colu	mns, des	ign for	imperfections	Ι	LO-1, LO-2 LO-3			
Practical Work											
1. Buckling	of struts							LO-1			
2. Torsion at	nd biaxial ben	ding tests						LO-1			
3. Build and	test a truss							LO-4			
Assignments	11 2 1						-				
1. Tutorials	on all 5 topics	5					1	LO-2, LO-3			
	Category		Туре		Α	ssessed LOs		Weightage			
		Complete labshe biaxial bending	eets on torsion tests [2%]	and		LO-1					
	CA	Coursework on	buckling of st	ruts [3%]		LO-1		200/			
Assessments	CA	Performance of	truss [10%]			LO-4		50%			
		In-class quizzes	(Best 3 out of	4) [15%]]	LO-1, LO-2 LO-3					
	WE	End Semester E	xamination]	LO-1, LO-2 LO-3		70%			
Recommended '	Fextbooks	 Case, J Structu Ryder, Macmi 	. and Chilver, res (2 nd ed.). L G. H. (1969). llan.	A. H. (19 ondon: E Strength	971). St Edward of Mat	arrength of Mate Arnold. erials (3 rd ed.).	erials Hou	and ndmills:			
Names of Lectu	rers	Prof. I. R. A	. Weeraseker	a							

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	Н											L	
LO-2	М												
LO-3	М												
LO-4	L		М						М			L	
Module	Μ		L						L			L	
S	cale:	H – Hig	h	M - 1	Medium		Ι	L – Low					

Module Code	CE1122	Module Title	Fluid Mechanics	s II				
Credits	3.0		Lectures		2.5	D	GE1022	
GPA/NGPA	GPA	Hours/Week	Lab/Assignmen	nts	3/2	Pre-requisites	CE1022	
Module Type:	Core Mod	ule/Compulsory	▼ E	Electiv	e 🗖	Op	tional	
Learning Outco	mes (LOs)	students should b	e able to:					
I O_1: compute t	the flow rates	in pipes/ channels	and their sizes re	aniroa	lunder	different condit	ions	
LO-1: compute t	the flow rates	and hydraulic hea	ds in nine networl	ks hv	iterativ	re methods	10115,	
LO-3: <i>identify</i> fl such devi	ow measuring	g devices suitable	for various application	ations	and de	etermine the flow	v rates using	
LO-4: apply the	ories of ideal	fluid flow to simu	late real flow cond	ditions	s, and			
LO-5: articulate	the general la	aws governing rea	l fluid flow.					
Module Outline	•						LOs Covered	
Pipe flow [12 h] Laminar and tur transmission by	bulent flow in pipes	pipes, head losse	s, flow rate and pi	ipe siz	es requ	uired, power	LO-1	
Pipe networks [Analysis of pipe	4 h] networks by it	terative methods,	computer based a	nalysi	\$		LO-2	
Flow measurem	LO-3							
Steady, uniform	flow in oper	channels [6 h]	siream flow, flow f	10111	uniks/ n	250170115	LO-1	
Ideal fluid flow	[5 h]	flow patterns and	combinations an	nlicat	ions		LO-4	
Flow of real flui	ids [2 h]	cations	comotnutions, up	piicai	.0115		LO-5	
Practical Work	μαιιοπ, αρρικ	carrons						
1. Head loss	es in pipe flo	W					LO-1	
2. Flow mea	surements						LO-3	
Assignments						1		
1. Computer	r aided pipe n	etwork analysis					LO-2	
2. Tutorials	on all 6 sectio	ons					All	
	Category		Туре			Assessed LOs	Weightage	
		Coursework on [7.5 %]	head losses in pipe	e flow		LO-1		
Assessments	CA	Coursework on	flow measurement	ts [7.5	%]	LO-3	30%	
	CA	Coursework on network analysis	computer aided pi s [10 %]	pe		LO-2	5070	
	WE	End Semester E	xamination			All	70%	
Recommended	Textbooks	 Chadw and En Hamill Macmi Kumar (9th ed.) 	ick, A., Morfett, J vironmental Engin , L. (2002). Under llan Limited , D. S. (1987). Flu),	., Bor neerin rstand iid Me	thwick g, (4 th) ing Hy echanic	, M. (2004). Hyd ed.), Abingdon draulics, (3 rd ed.) ss and Fluid Pow	lraulics in Civil), Palgrave er Engineering,	
Nomes of Last	Nong	S. K. K	ataria & Sons	. A T	ם מ	atnacoari-		
Names of Lecturers Dr. T. M. N. Wijayaratna, Mr. A. H. R. Ratnasooriya								

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М	L										
LO-2	М	L	L	L								
LO-3	L	L										
LO-4	М	L	L	L								
LO-5	L											
Module	Μ	L	L	L								
S	cale:	H – Hig	h	M - I	Medium		Ι	L – Low				

Module Code	CE1132	CE1132 Module Title Building Construction and Materials									
Credits	3.0	TT /TT 1	Lectures	2.0			N				
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es	None				
Module Type:	Core Mod	ule/Compulsory	✓ Electiv	ve 🗆	С)ptior	nal				
Learning Outco After completing	mes (LOs) this module,	students should b	e able to:								
LO-1: <i>identify</i> ap advantage	propriate bui s and limitati	lding materials for ons with regard to	r use in low and mediu sustainability, availabi	m rise b ility and	ouildings consi l economic via	derin; bility	g their				
LO-2: recognize their const	the role of di ruction meth	fferent elements in ods and their comp	n a building; foundation pliance with relevant st	ns, wall andard	s, doors, windo s,	ows, 1	oofs, finishes,				
LO-3: <i>specify</i> and and quality	d <i>adopt</i> manu y assurance f	ifacturing processe or cement, concret	es, properties and test n e, masonry, timber and	nethods I steel, a	including that	of qu	ality control				
Module Outline			contorni to relevant sta	andarus		L	Os Covered				
Introduction to	huilding con	struction and but	ilding elements [1 h]								
Identification of l buildings	<i>iccition to building construction and building elements</i> [4 n] <i>iccition of building elements, theory and practice and its use in the construction of</i>										
Building materia Identification and relevant structure foundations, wall	Building materials and construction methods [8 h]Identification and use of suitable building materials and construction methods which satisfy relevant structural, health, safety, serviceability specifications and standards for foundations, walls, doors and windows, roofs, floors and finishesLO-1, LO-2, LO-4										
Alternative cons	struction ma	terials and metho	ods [8 h]			1	LO-1, LO-2,				
Properties and s Manufacturing p materials includi materials	specifications rocesses, pro ng cement, st	s of construction perties, specificati eel, bricks, timber	materials [8 h] ions and test methods for concrete aggregates,	or main sand, r	a construction oof covering	L	O-1, LO-3, LO-4				
Practical Work											
1. Tests on a	ggregates					LO	-1, LO-3, LO-4				
2. Concrete	Mix Design					LO	-1, LO-3, LO-4				
3. Tests on C	Ordinary Port	land Cement				LO	-1, LO-3, LO-4				
4. Properties	of Thilder					LU	-1, LO-3, LO-4				
1. Tutorials of	on all 4 topic	S				L	.O-1, LO-2, .O-3, LO-4				
2. Take hom	e assignment	S				Ι	.O-1, LO-2				
	Category		Туре	А	ssessed LOs		Weightage				
		In-class quizzes	[5%]		LO-1, LO-2, LO-3						
		Coursework on a	aggregate testing [5 %]		LO-1, LO-3, LO-4						
		Coursework on ([5%]	Concrete M1x design		LO-1, LO-3, LO-4						
Assessments	CA	Coursework on Cement [5%]	Ordinary Portland		LO-1, LO-3, LO-4		30%				
		Properties of tim	ber [5%]		LO-1, LO-3, LO-4						
		Take-home assig	nment [3%]]	LO-1, LO-2						
		Active participat tutorial sessions	[2%]		LO-1, LO-2, LO-3, LO-4						
	WE	End Semester Ex	amination		ALL		70%				

CIVIL ENGINEERING STUDENT HANDBOOK 2020

				1. See Seri	ley, I. H. ies) (5 th e	(1995). d.). Red	Building Globe Pi	g Techno ress.	ology (Bı	uilding au	nd Surve	ying			
Recomme	ended			2. Bar Bla	ry, R. (1 ckwell.	999). Th	e Constr	uction of	Buildin	gs (7 th ed	.). Wiley	-			
Textbook	5			3. Her Ma	ndry, A. Y emillan H	W. (1981 Publisher). Struct s Limite	ural Bric d.	ckwork (2 nd ed.). I	London:				
Names o	f Lectu	rers	Pro	rof. (Mrs.) C. Jayasinghe, Prof. S. M. A. Nanayakkara											
Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)														
								-	-	-	-				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
LO-1	Μ						М				L	L			
LO-2	М		L	L		М	L			М		L			
LO-3	Н		М			L			М			L			
LO-4							Н					М			
Module	М		L	L		L	Μ		L	L	L	Μ			
S	Scale: H – High M – Medium L – Low														

Module Code	CE2013	Module Title	Structural Mechanics	II								
Credits	3.0		Lectures	2.5	D	1/1000						
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisit	es ME1032						
Module Type:	Core Mod	ule/Compulsory	Electiv	7е 🗖	C)ptional 🗌						
Learning Outco	omes (LOs)											
After completing	g this module,	students should b	e able to:									
LO-1: <i>compute</i>	nisms in a mate	erial,										
LO-2: examine												
LO-3: <i>compute</i> forces and displacements in determinate and indeterminate structures, and												
LO-3: <i>compute</i> forces and displacements in determinate and indeterminate structures, and LO-4: <i>perform</i> two-dimensional (2D) computer modelling of simple structures.												
LO-4. <i>perform</i> two-dimensional (2D) computer moderning of simple structures.												
Module Outline		LOs Covered										
Analysis of elas	tic stress and	strain at a point	; Mohr Circles; Gener	alized	Hook's Law							
[8.5 h]						LO-1						
Introduction to s	stress and stra	in analysis, analy time	sis of stress, analysis of	strain	, Mohr's	201						
<i>circle, stress - st</i>	rain relations	hips bl										
Study different t	heories of ela	II] stic failures failur	e mechanisms for ducti	le and	hrittle	I O-1						
materials	ieories of eiu.	siic juitares, juitar	e mechanisms jor auci	ie unu	Druue	L0-1						
Influence lines	for determin	ate structures [7.	5 h]									
Influence lines f	or determinat	e structures and b	asic concepts, effect of t	moving	loads,	LO-2						
distributed load.	s and series oj	f point loads										
Moment distrib	oution metho	ds [7.5 h]										
Introduction to 1	noment distri	bution method (M	DM), analysis of contin	uous b	eams and	LO-3						
frames using MI)M na [7 5 h]											
Introduction to	us [1.5 II] energy theorem	ms calculations of	f strain energy due to a	rial sh	ear hending							
and torsional a	ctions. theory	em of minimum	potential energy due to d	igliano	's theorems.	LO-3						
principle of virti	ual work, etc,	analysis of trusses	, beams and frames usi	ng ener	rgy theorems							
Computer mod	elling of two-	dimensional stru	ctures (Practicals) [9]	h]								
Introduction to a	a commercial	finite element pac	kage (SAP2000), degree	es of fr	eedoms and	LO-4						
different 1D eler	nent formulat	ions, analysis of a	trusses, frames and she	ell stru	ctures							
Practical Work												
1. Compute	r laboratory c	lasses				LO-4						
Assignments			·									
2 Compute	r modelling o	f a 2D truss (iliuiv	e (individual submission)	n)		L0-4						
2. compute	110											
	Category		туре	A	ssessed LUs	weightage						
		Reports on 2 cor (individual subm	nputer assignments nissions) [20]	%]	LO-4							
Assessments	CA	Two in class qui	zzes (best 2 out of 3		LO-1. LO-2	30%						
		quizzes will be s	be selected based on the		LO 1, LO-2, LO-3							
		maximum marks	5) [10	%) 1	01102							
	LO-3	70%										
		1										

Recomme Textbook	1. 2. 3. 4. 5.	² Materia). Streng (. (1969). (09). Mea Analysi	ls Vol. 1 th of Ma Structur chanics o s (6 th ed.	(3 rd ed.) terials an res. Lond of Materi). Lafaye	. Oxford ad Struct on: Isaac als (7 th e tte: Pears	: ures (2 nd c Pitman. d.). son.						
Names of	Names of Lecturers Dr. H. G. H. Damruwan											
Mapping	of Mod	ule Lea	rning Ou	itcomes	(MLO) 1	to the Pr	ogramn	ne Outco	omes (Po	0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	Н		L									L
LO-2	Н											L
LO-3	Н											L
LO-4					М					L		М
Module	Н											
S	Scale: H – High M – Medium L – Low											

Module Code	CE2022	Module Title	le Design of Steel Structures											
Credits	3.0		Lectures	2.0										
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es CE1112								
Module Type	Core Modu	lle/Compulsory	Electi	ve 🗖	C	ptional								
Learning Outcom	nes (LOs)	-4-14111	L											
After completing	inis moauie,	students snouta l	be able to:											
LO-1: <i>convince</i> a	client on the	merits of structur	al steel construction,											
LO-2: propose alt	ernative solu	itions for a client'	s brief and <i>justify</i> the s	electior	of a particular	r solution,								
LO-3: assess the 1	magnitude of	f loads and <i>identif</i>	y load paths in a struct	ure,										
LO-4: prepare str	LO-4: <i>prepare</i> structural calculations adopting relevant design standards, and													
LO-5: articulate lessons learnt from historical failures of structures.														
Module Outline						LOs Covered								
Introduction to t <i>Explain what is m</i> <i>and the philosoph</i>	tion to the process of design [2 h] <i>vhat is meant by design of a structure, the features of a well designed structure</i> <i>hilosophy of design</i>													
Types of loads, tl Permanent and vanature, their effec	Types of loads, their effects and load paths [2 h] Permanent and variable loads including imposed and wind loads, the static and dynamic nature, their effect on the structure and how they are traced to the ground with examples													
Properties of stee Manufacture of st structural design	el in relation eel, its advar and how it si	to design [2 h] ntages and disadve hould be selected of	antages, its properties according to standards	relevan s/specifi	t to cations	LO-1, LO-2, LO-4								
Design of steel m Elements of a stru ensured using Eur	embers sub acture and ha	ject to tension, co w they perform, a an example code	ompression and bendi lifferent failure modes	ing [12 and how	h] w safety is	LO-4								
Design of steel co simple connection weld required in c	onnections [as and how to a simple cont	6 h] The behaviou determine either vection	ur of bolts and welds in the size/number of bol	differe ts and o	nt types of or length of	LO-4								
Design failures [4	4 h] Introduc	the concept of la	earning from failures h	nighligh	ting some	LO-5								
Assignments	n nisiory un	a the tessons tearr												
1 Report to c	onvince a cl	ient on the merits/	demerits of steel for a	nronose	ed structure	LO-1								
2. Report pro	posing alterr	atives for a roof s	tructure	propos		LO-2								
3. Load evalu	ation and str	uctural calculation	ns			LO-3,LO-4								
4. Presentation on lessons learnt from failure of structures LC														
	Category		Туре	A	ssessed LOs	Weightage								
		In class un-anno	unced quizzes [10%]		LO-4									
Assessments	CA	Individual and G Assignments (in [15%]	Group in class and take home)		LO-1,LO-2, LO-3,LO-4	30%								
		Report on Design	n failures [5%]		LO-5									
	WE	End Semester Ex	amination		All	70%								

			1.]	Narayana Engineers	in, R.S. s. Londo	and Beel n: Spon I	by, A.W Press.	. (2001).	. Introdu	ction to	Design	for Civil
			2.	Hettiarac Design of	hchi, M.' f Steel St	T.P. and tructures	Nanayak to Euroc	kara, K. ode 3.	I.U. (201	9). An I	ntroducti	on to the
Recomm	ended		3. 4 1	Arya, C. (and timbe Press.	(2009). I er design	Design of s to Briti	Structur ish Stand	al Eleme lards and	ents: Cor l Euroco	ncrete, ste des(3 rd ed	eelwork, l.). Lond	masonry on: Spon
Textbool	KS .		4.]]	Brettle, I Eurocode	M.E. an es. Ascot	d Browr : Steel C	n, D.G. onstructi	(2009). on Instit	Steel B ute.	uilding	Design:	Concise
			5.]	Davison, Ascot: St	B. and eel Cons	Owens, (truction	G.W. (20 Institute	11). The and Oxf	e Steel I ord: Blac	Designer' ckwell.	s Manua	$al(7^{th}ed.).$
 Draycott, T. and Bullman, P. (2009). Structural Elements Design Mar Working with Eurocodes (2nd ed.). Butterworth-Heinemann. 											Manual:	
Names o	f Lectur	ers	Dr. (N	Ars.) M.7	T.P. Hetti	iarachchi						
Mapping	g of Mod	ule Lea	rning Ou	itcomes	(MLO) 1	to the Pr	ogramn	ne Outco	omes (PO	C)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L		L			L	L			L		
LO-2			М			L	L			M		
LO-3	М				М				М			
LO-4	Н		М		М							L
LO-5								L	М	Н		Н
Module	Μ		M M L L L M M M									
:	Scale:	H – Hig	gh	M – I	Medium		Ι	L – Low				

Module Code	CE2032	Module Title	dule Title Hydraulic Engineering I									
Credits	3.0		Lectures	2	.5							
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3	/2	Pre-requisit	es	CE1122				
Module Type:	Core Modu	ule/Compulsory	Elec	tive		0	ptio	nal				
Learning Outcom After completing	mes (LOs) this module,	students should b	e able to:									
LO-1: <i>explain</i> the	e influence of	f boundary layer o	n the flow over solid	surfa	ces.							
LO-2: <i>annly</i> the t	echniques in	dimensional analy	vsis and physical mo	lellin	g in	solving engine	ering	problems.				
LO-3: <i>compute</i> th	e surge press	sures developed in	pipes and <i>devise</i> im	pact n	nitig	ation measure	s. and	1				
LO 3: compute d	various types	of hydraulic mac	hines used in engine	puet in pring i	nraci	tice and <i>analys</i>	se the	<u> </u>				
performa	nce of centrif	fugal pumps, impu	ilse and reaction type	turbi	nes.	tiee and <i>unary</i> .						
Module Outline							L	Os Covered				
Boundary layer Flow over solid s	cations		LO-1									
Dimensional ana	lysis and ph	ysical modelling	[10 h]		11							
Dimensional hom	ogeneity, Bu	ckingham's pi the	orem, significance of	non-a	dime	nsional		LO-2				
groups, criteria g	overning phy	vsical modelling										
Unsteady flow in	nis [7.5 n] pipes. water	hammer. surge ta	nks					LO-3				
Hydraulic mach	inery [10 h]											
Different types of	hydraulic m	achines, rotodyna	mic machines, chara	cterisi	tics	of pumps and		LO-4				
turbines, pumps i	n pipeline sy.	stems, turbines an	d their efficiencies									
1 Physical m	odelling of h	avdraulic structure	26					10-2				
2. Testing the	e performanc	e of a centrifugal	pump				LO-2 LO-4					
3. Series and	parallel use	of centrifugal pur	ips				LO-4					
Assignments												
1. Tutorial 1	on boundary	layer theory and o	dimensional analysis				1	LO-1, LO-2				
2. Tutorial 2							1	LU-5, LU-4				
	Category		Туре		A	ssessed LOs		Weightage				
		Mid-Term Test	0%]			LO-1, LO-2						
		Assignment I [0	%]		1	LO-1, LO-3						
		Assignment 2 [0	%]		Ι	LO-1, LO-2						
Assessments	CA	Assignment 3 [0	%]		Ι	LO-3, LO-4		30%				
		Report on Lab C	lass 1 [10%]			LO-2						
		Report on Lab C	lass 2 [10%]			LO-4						
		Report on Lab C	lass 3 [10%]			LO-4						
	WE	End Semester Ex	kamination			All		70%				
Recommended 7 Books	ſexts	 Chadwick, A., Morfett, J. and Borthwick, M. (2004). Hydraulics in Civil and Environmental Engineering (4th ed.). Abingdon: CRC Press. Hamill, L. (2002). Understanding Hydraulics (3rd ed.). Palgrave Macmillan Limited. Cengel, Y. S. and Cimbala, J. M. (2006). Fluid Mechanics – Fundamentals and Applications (3rd ed.). McGraw-Hill 										
Names of Lectur	ers	Dr. T. M. N	. Wijayaratna									

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L											
LO-2	М	М	М	L								L
LO-3	М	М	М	L								L
LO-4	М	М	М	L								L
Module	М	Μ	Μ	L								L
S	cale:	H – Hig	h	M - M	Medium		Ι	L – Low				

Module Code	CE2042	Module Title Soil Mechanics and Geology I											
Credits	3.0		Lectures	2.0									
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisite	es None							
Module Type:	Core Mod	ule/Compulsory	Electiv	ve 🗆	0	ptional							
Learning Outco After completing	mes (LOs) this module,	students should b	e able to:										
LO-1 explain the	e formation o	of rocks and soils											
LO 1: explain the	<i>te</i> the funda	mental concepts of	f geological manning										
LO-3: <i>identify</i> th using appr	e fundamenta opriate labor	al properties of soi atory testing, and	ils and rocks and <i>deterr</i>	<i>nine</i> the	e basic engineer	ring properties							
LO-4: <i>classify</i> soils and <i>assess</i> the suitability of the soil for different civil engineering constructions													
Module Outline						LOs Covered							
Geology [10 h] Geological histor Crust of the Earth earthquakes, volo Internal and s lithification, uplij Igneous, sedimen rock types, and c. Rock forming min	ry and Intern h: compositio canoes, ridge urface proc ft, volcanism, tary and met haracteristic, nerals: silica	al structure of the on, strata, minor a s, trenches, subdu esses: weathering, plutonism, metan amorphic rocks: e ; te and non-silicate	Earth nd major intrusions; te ction; , erosion, transpor torphism, melting, mou nvironments of rock fo e minerals.	ectonic j tation, intains; rmation	plates, deposition, 1, rock forms,	LO-1, LO-2							
Soil Mechanics Basic Properties Particle Size Ana Plasticity: clay m Classification of Compaction of So modified Proctor quality control	(18 h) of Soils: forr ilysis: sieve a iinerals, Atte soils accordi oils: effects o compaction	nation of soils, ma nalysis, hydromet rberg limits, Plast ng to unified class f soil type water co tests, air voids lin	ass volume relationship er analysis; icity chart; ification system; ontent and compaction ues, methods of compac	s; effort, ction in	standard and the field and	LO-3, LO-4							
Practical Work													
1. Particle si	ze distributio	n analysis				LO-3							
2. Plasticity	characteristic	es of soils				LO-3							
3. Proctor co	ompaction tes	t				LO-3							
4. In-situ der	nsity tests					LO-3							
Assignments													
1. Selection	of suitable m	aterials for the con	nstruction of an earth da	am		LO-4							
2. Geology r	napping	T				LO-1, LO-2							
	Category		Туре	А	ssessed LOs	Weightage							
		Un-announced q	uiz [10%]	1	LO-3, LO-4								
Assessments	CA	Selection of suita construction of a	able materials for the a start dam [5%]		LO-4	30%							
	CA	Report(s) on Lab	classes [10%]		LO-3	5070							
		Report(s) on Geo	ology mapping [5%]	1	LO-1, LO-2								
	WE	End Semester Ex	kamination		All	70%							
Recommended		1. Das, B. Boston:	M. (1998). Principles of PWS.	of Geot	echnical Engin	eering (4 th ed.).							
Textbooks		2. Craig, I	R. F. (1997). Soil Mech	anics (5 ^m ed.). E & FN	Spon.							
		3. Coduto	, D. P. (1998). Geotech	nical E	ngineering. Pre	entice Hall.							

				 Holtz, R. D. and Kovacs, W. D. (1981). An Introduction to Geotechnical Engineering. Prentice Hall. 									
				 Blyth, F. G. H. and de Freitas, M. (1984). A Geology for Engineers ed.). CRC Press. 									
Names of Lecturers Prof. U. G. A. Puswewala, Prof. S. A. S. Kulathilaka, Dr. U. P. Nav											. Nawag	amuwa	
Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)													
	TL												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	L												
LO-2	L									М			
LO-3	L	L			L				L	L		L	
LO-4	Н	L	L		L					L		L	
Module	Μ	L	L		L				L	L		L	
S	Scale: H – High M – Medium L – Low												

Module Code	Certode CE2052 Module Title Construction Planning and Cost Estimating											
Credits	3.0	TT (TT)	Lectures	2.0	D		N					
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es	None					
Module Type:	Core Mod	lule/Compulsory	Electiv	ve 🗆	0	ptiona	al 🗖					
Learning Outco	mes (LOs) this module	e. students should b	e able to:									
LO-1: extract inf	formation fro	om construction dr	wings for cost estimate	es and i	nterim valuatio	ns						
LO-2: <i>prepare</i> B specificati	fills of Quantions,	tities and interim v	aluations of a construct	ion pro	ject complying	to sta	ndards and					
LO-3: produce c	onstruction j	plans using project	management and IT to	ols, and	1							
LO-4: <i>check</i> for the compliance of Building regulations of a building.												
Module Outline LOs Covered Preparation of construction drawings [8 h]												
Preparation of o	construction	drawings [8 h]										
Preparation of drawings using computer tools such as AutoCAD, extracting information from drawings for the preparation of hills of quantities and interim valuations												
emphasis to be m	ade on deta	il drawings	quantities and interim	· · ui nui	ions, speciai							
Preparation of Bills of Quantities [8 h] Centre line method, taking off methods and calculations of quantities, preparation of Bills of Quantities for the requirements given in SLS 573 and similar standards, pricing												
Construction pl	anning [8 h]	nii raies oj constru I	CHON WOFK									
Planning method path methods, ex computer tool	ls such as Ac tracting esti	tivity on Node (AC mating data for pla	DN) and Activity on Arra nning work and applica	ow (AO ations d	PA), critical of MS Project	L	0-2, LO-3					
Building regulat Introduction to b	tions [4 h] wilding regu	lations				LO-2, LO-4						
Practical Work												
1. Preparatio	on of AutoCA	AD drawings					LO-1					
Assignments		jeet computer tool					LO-3					
1. Class assi	gnment on N	Jetwork analysis				LO	D-1, LO-2, LO-3					
2. Taking of	f and prepar	ation of BOQ and t	ender documents			L	0-2, LO-3					
3. End seme	ster assignm	ent				LO	D-2, LO-3, LO-4					
	Category		Туре	А	ssessed LOs	1	Weightage					
		Report on Assign analysis [6%]	ment 1 on Network]	LO-1, LO-2, LO-3							
Assessments	CA	Report on Assign Tender [15%]	ment 2 on BOQ and]	LO-2, LO-3		30%					
		Report on End se	mester assignment [9%		LO-2, LO-3, LO-4							
-		70%										
Recommended Textbooks		1. SLS 573, Method of measurement of building works. Sri Lanka Standards Institution.										
Names of Lectu	rers	Prof. A. A. D. A. J. Perera, Prof. R. U. Halwatura										

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М				L					М		М
LO-2	L									Н	Н	М
LO-3	L	М	М		Н				L	Н	Н	М
LO-4	L	L						Н				М
Module	Μ	L	L		Μ			Μ	L	Н	Н	М
S	cale:	H – Hig	h	M - M	Medium		Ι	L – Low				

Module Code	CE2062	Module Title	Surveying I							
Credits	3.0	II	Lectures	2.0	Data and and attack	News				
GPA/NGPA	GPA	Hours/ week	Lab/Assignments	3/1	Pre-requisites	None				
Module Type:	Core Module	c/Compulsory	 Elective 		Opti	onal				
Learning Outco After completing	omes (LOs) g this module,	students should be	e able to:							
LO-1: demonstra	ate an underst	anding of the use of	of survey measurements	s in civ	il engineering,					
LO-2: use surve	y instruments	to make measuren	nents in the vertical and	horizo	ontal planes, and	1				
LO-3: produce h	and-drawn su	rvey plans and lor	ngitudinal section/cross-	-sectior	n drawings.					
Module Outline	•					LOs Covered				
Introduction to Classification of magnetic bearing measurements, c	Land Survey surveying, pr g, linear and oordinates or	ying [8 h] finciples of surveyi angular measurem a earth's surface	ing, method of surveying eents, scale and maps, e	g, true rrors ii	bearing and n	LO-1				
Linear measure Chain, tape and booking procedu	ements and C accessory ins are, plotting end	Chain Surveying [truments, survey st rrors and correction	6 h] tations and lines, offsets ons	s, field	procedure,	LO-2				
Leveling and C Levels, levelling booking procedu curvature and re	Contouring [8 staff, reduced ures, fly-back, efraction, cont	b] l level and level dij longitudinal and c tours and contouri.	fferences, rise and fall, cross-sections, errors ann g	height nd corr	of collimation, vections,	LO-2, LO-3				
Theodolite Survey Vernier and glass methods of trave	v eying [6 h] ss–circle theoo rsing, angula	dolite: measureme r and linear error,	nt of horizontal and ver correction of coordina	tical aı tes	ngles, bearing,	LO-2, LO-3				
Practical Work										
1. Chain Sur	rveying					LO-1, LO-2				
2. Levelling	o Survoving					LO-1, LO-2				
Assignments	e Suiveying					LO-1, LO-2				
1. Detail dra	wing using li	near measurement	S			LO-3				
2. Cross-sec	tion and long	itudinal section dra	awings			LO-2, LO-3				
3. Traverse	adjustment, c	omputation and de	tail drawing			LO-2, LO-3				
	Category		Туре	A	Assessed LOs	Weightage				
		Competency in C [5%]	hain surveying fieldwor	rk	LO-1, LO-2					
		Detail drawing us [5%]	ing linear measurement	ts	LO-3					
Assessments	CA	Competency in L	evelling fieldwork [5%]]	LO-1, LO-2	30%				
		Cross-section and drawing [5%]	l longitudinal section		LO-3					
		Competency in T	heodolite surveying [5%	6]	LO-1, LO-2					
		detail drawing [59	%]		LO-2, LO-3					
	WE	End Semester Exa	amination		All	70%				
Recommended	Textbooks	 Banniste Harlow: Duggal, 	r, A., Raymond, S. and Addison Wesley Longr S. K. (2004). Surveying	Baker, nan. g (Volu	R. (1998). Sur me 1). Tata Mc	veying (7 th ed.). -Graw Hill.				
Names of Lectu	ames of Lecturers Prof. U. G. A. Puswewala, Mr. T. D. C. Pushpakumara									

Mapping	of Mod	ule Lear	ning Ou	tcomes	(MLO) 1	to the Pr	ogramn	ne Outco	omes (PO))		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	Н											
LO-2	М				М				М			L
LO-3	М									Н		L
Module	Μ				L				Μ	H		L
S	cale:	H – Hig	h	M – N	Medium		Ι	L – Low				

MILCI	OF 2112	CE2113 Module Title Structural Analysis I									
Module Code	CE2113	Module Title	Structural Ana	lysis I							
Credits	3.0	Hours/Week	Lectures		2.5	Pre-requisite	96	CE1112			
GPA/NGPA	GPA	Hours, week	Lab/Assignme	ents	3/2	i i e requisit	00	CEITIE			
Module Type:	Core Mod	ule/Compulsory		Electiv	ve 🗆	0	ption	al			
Learning Outco	omes (LOs)	. 1 . 1 . 111	11 4								
After completing	g this module,	, students should b	e able to:								
LO-1: <i>demonstr</i> suitable r	<i>ate</i> the knowl nethods for h	edge of different t and calculation an	ypes of structura d computer appli	l analy ication	sis met respec	hods and <i>ident</i> tively,	ify th	e most			
LO-2: <i>describe</i> indeterm	the generalize	ed nature of structues,	ıral analysis metl	nods a	nd their	related basic c	once	pts for			
LO-3: solve prot observe t	blems with m heir limitation	atrix force method	l of analysis and	apply	it to tru	sses and contin	uous	beams and			
LO-4: solve pro	blems with m	atrix displacement	t method of analy	sis rel	ated to	trusses, contin	uous	beams,			
LO-5: <i>apply</i> pla	s.										
Module Outline		L	Os Covered								
Introduction to Introduction to n	analysis of s	tatically indetern	ninate structure statically indeter	s [3 h] minate	structi	ıres		LO-2			
Analyse statical	nalysis [8 h]										
Solve problems v	and		LO-3								
continuous bean	is, limitations	of force method	:4h								
analysis [6 h]	iy indetermi	nate structures w	ith matrix displ	aceme	ent met	noa oi					
Solve problems v	vith matrix di	splacement metho	d of analysis, dei	monstr	ate the	applications		LO-4			
of it to trusses, c	ontinuous bed	ams, frames and g	rid structures								
Plastic analysis	of beams, fra	amed structures a	and slabs [18 h]	<i></i>	11						
Plastic zone, pla	stic behaviou	ir of beams, basic abusis of framed	conditions of pla	astic c d line	ollapse	, statical and		LO-5			
application	noucnes, un	uysis of framea	structures, yter	u une	meme	a ana men					
Introduction to	2D and 3D r	nodelling with co	mputer softwar	e (Pra	cticals)	[14 h]					
Introduction to S	SAP2000 finit	e element analysis	software, model	ling di	fferent	types of truss		LO-1			
and framed struc	ctures and ver	rifying with simple	manual calculat	tions							
1 Computer	r laboratory c	20220						10-1			
1. computer		105505					L	0-2. LO-3.			
2. Tutorial classes						L	.O-4, LO-5				
Assignments											
1. Computer	r modelling of	f curved frames (in	ndividual submis	sion)			L	.O-1, LO-2			
2. Computer	r modelling of	f 3D truss structur	e (group submiss	sion)			L	.O-1, LO-3			
	Category		Туре		Α	ssessed LOs		Weightage			
		In-class compute	er quiz [5%]			LO-1					
		Individual comp modelling of cur	uter assignment oved frames [5%]	on]	LO-1, LO-2					
Assessments	CA	Computer assign	ment (group) on	100/1		LO-1, LO-3		30%			
		modelling of 3D	truss structure	10%]		02102					
		quizzes) [10%]	uizzes (best 2 ou	1013		LO-2, LO-3, LO-4, LO-5					
	WE	End Semester Ex	kamination			All		70%			
						All /0%					

			1. (I	Ghali, A	., Nevill	e, A. M	. and B	rown, T roach (6	. G. (20 th ed.) I	09). Str	uctural A Favler &	Analysis: Francis	
Recomme	ended		[624.04:5	519.6]	und mu	шк трр	iouen (o	cu.). L	ondon. 1	ruyici d	T functs.	
I extbook	S		2. M H	Megson, Butterwo	T. H. rth-Hein	G. (20 emann. [14). Str 624.04 M	ructural M4]	and St	ress An	alysis (2 nd ed.).	
Names of	Lecture	ers	Dr. H	(. M. Y. (C. Mallil	karachch	i, Dr. H.	G. H. Da	amruwar	ı			
Mapping	of Mod	ule Lear	ning Ou	ng Outcomes (MLO) to the Programme Outcomes (PO)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	Μ				Н							L	
LO-2	Μ				Μ							L	
LO-3	Н	Μ			Μ								
LO-4	Η	М											
LO-5	Н	Μ											
Module	Н	Μ			Н							L	
1													
S	cale:	H – Hig	h	M - I	Medium		Ι	L – Low					

	 								
Module Code	CE2122	Module Title	Design of Concrete S	tructur	es I				
Credits	3.0		Lectures	2.0	_				
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es	CE1112		
Module Type:	Core Mod	ule/Compulsory	Electiv	ve 🗆	C	ption	nal		
Learning Outco	omes (LOs)								
After completing	g this module,	students should b	e able to:						
LO-1: recognize	the need to a	ppreciate the cons	truction aspects during	the stru	uctural design p	proces	ss,		
LO-2: <i>formulate</i> for the se	e alternative so lection of opti	olutions for a prop	osed building so that pr	elimin	ary designs cou	ıld be	conducted		
LO-3: <i>relate</i> structure complete	uctural model the structural	ling and analysis f designs,	or low rise buildings wi	hile ve	rifying the resu	lts of	analysis to		
LO-4: <i>execute</i> d using app	etailed design propriate desig	calculations for d	ifferent components of	reinfor	ced concrete lo	ow-ris	se buildings		
LO-5: prepare of of structu	letailed drawin ral design.	ngs according to s	tandard methods of deta	ailing to	o communicate	the f	inal outcome		
Module Outline	e					L	Os Covered		
Introduction to Introduction, ma aspects in design	reinforced c aterial proper n and constru	oncrete and the c ties, member types	onstruction aspects [1 and connectivity, load	h] paths,	important	LO-1			
Preliminary de Initial member s	sign concepts	and selection of g to the architectu	member sizes [2 h] ral drawings, approxim	nate rei	nforcement		LO-2		
Methods for pe Slab analysis and columns and bed of frame analysis	rforming str ad approximat ams approxim s, validation 1	uctural idealization ion to beams dependentions into braced nethods, etc.	on and modelling for a nding on the type, supp or unbraced frames, a	analysi ort and pproxii	s [3 h] l loading, nate method		LO-3		
Behaviour in fl The behaviour of mechanisms, int	exure and sh of beams, slab roduction to r	ear [4 h] s, footings (pad an einforcement deta	d strip) under flexure a iling	and she	ar, failure	Ι	LO-3, LO-4		
Design of struc Detailed design spanning/two w footing subjecte staircases (span staircases with o	tural element a of beams ay spanning/c d to vertical b ning between cantilevered so	ts [16 h] (continuous/simpl antilever/flat slab. load only, load + landings, landing teps)	y supported/cantilever s), columns (short and , uni axial bending, loa and floor, foundation a	[.]), slał slender d+biax und land	os (one way :), bases (pad ial bending), ding,		LO-4		
Standard meth	od of detailin	g for reinforced			LO-5				
Reinforcement d	letailing of be	ams, stabs, columi							
1 Casting a	nd testing of t	wo reinforced cor	ocrete beams				I O-4		
Assignments	ind testing of	two remioreed cor					L0-4		
2. Assignme	ent on design	and detailing of a	four/five-storev buildin	g			All		
2.710516111	Category		Type	<u> </u>	ssessed LOs		Weightage		
	gory	In-class quiz [10	- 3 P~		10-2 10-4				
		Report on labors	tory experiment [50/1		10-1 $10-3$				
Assessments	CA	Report on design structural element story building [2	and detailing of the for a given four/five	-	All		40%		
	WE	End Semester Ex	xamination		All		60%		
	1	1		1		00%			

Recomme Textbook	ended s	1 2 4 5 6	 Reyn Hand The I conce Engin Mose Euroo Dias, Bhatt Euroo Grou 	olds, C. lbook (1 institutio rete build neers UK ely, B., code 2 (6 W. P. S t, P., Ma codes De p.	E. and S [th ed.). L n of Stru ding stru C. Bungey, 5 th ed.). P . Graded cGinley, esign Th	teedman condon: I ctural Er actures to J. and algrave I example T. J. and eory and	, J. C. (20 E &F N S op EC2. 1 Hulse, 1 Macmilla is in Rein Choo, 1 Exampl	007). Re Spon, Ta (2000). M Published R., (200 an. nforced c B. S. (20 les (4 th ed	inforced ylor & F Manual f d for the 7). Rein concrete 013). Rei d.). CRC	concrete Francis G or the de e Institut forced c design to inforced C Press, T	 designer roup. sign of re- ion of S oncrete Eurocoe concrete Faylor ar 	er's einforced tructural design to de. design to ad Francis	
Names of	Lecture	ers	Prof.	M.T.R.	Jayasing	ghe, Dr. (Mrs.) J.	C. P. H.	Gamage				
Mapping	of Mod	ule Lear	ning Ou	itcomes	(MLO) 1	to the Pr	ogramn	ne Outco	omes (P	D)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1			L			L	М						
LO-2			М			L				L			
LO-3	Н	L	Н		Μ					Μ		М	
LO-4	Н	L	Н	H L H H									
LO-5													
Module	Μ	L	Μ		L	L	L			Μ		Μ	
S	cale:	H – Hig	h	M - I	Medium		Ι	L – Low					

Module Code	CE2132	CE2132 Module Title Soil Mechanics and Geology II										
Credits	3.0		Lectures		2.0	D		252042				
GPA/NGPA	GPA	Hours/Week	Lab/Assign	nents	3/1	Pre-requisite	es C	JE2042				
Module Type:	Core Mod	ule/Compulsory		Electiv	ve 🗆	0	ptional]				
Learning Outco	mes (LOs)		1-1- 4									
After completing	this module,	students should b	e able to:									
LO-1: <i>classify</i> ro	cks and <i>explo</i>	<i>iin</i> groundwater h	ydrogeology,									
LO-2: <i>interpret</i> g	eological ma	ips with geologica	l structures,	.,		· · · · ·						
LO-3: evaluate th	e vertical str	esses and pore wa	ter pressure in	soils un	der stat	c water condit	ions,					
LO-4: <i>estimate</i> the such as ear	ered civil engir	ieering sti	uctures									
LO-5: <i>estimate</i> se improvem	r dewatering ar	id design										
Module Outline		LOs C	Covered									
Classify rocks an Soils on the Earth hydrological cyc. rivers, springs, w	vdrogeology: dwater flow,	LO	D-1									
Interpret geolog Geological struct faults, folds, unce	e forms,	LO-2										
Vertical stresses	litions [1 h]	LO-3										
Rate of flow an structures [8 h] Flow of water th coefficient of per in-situ, equivalen equations analysis	d pore wate arough soils. meability, de t permeability	er pressures in c concept of head etermination of the ty, two dimensional flow with	ommonly end l, energy equa e coefficient of Il flow, equation flow nets see	countere ution, on f permea on of con	d civil e dimen bility ir tinuity o	engineering nsional flow, the lab and and Laplace	LO	D-4				
Consolidations Consolidation: consolidation, de distributions in th consolidation du preloading	ttlements du concept of etermination he soils, estin e to dewater	a to construction consolidation, a of consolidation nation of amount a ing, secondary co	Stow heis, see ns and/or dew <i>Ferzaghi's tha</i> <i>characteristic</i> <i>ind rate of sett</i> <i>onsolidation, in</i>	atering [eory for cs in the lement day mprovem	9 h] • one e labor ue to lo cent of	dimensional atory, stress ading, soft clays by	LO	D-5				
Practical Work	try to at					T	L	0.4				
2. Consolida	tion test							0-5				
Assignments												
1. Estimation of seepage and pore water pressure distribution through an earth dam using flow nets								D-4				
2. Geology n		LO-1	, LO-2									
	Category		Туре		Α	ssessed LOs	Wei	ightage				
		Report(s) on Lab	classes 1 and	2 [10%]]	LO-4, LO-5						
Assessments	CA	Estimation of set pressure distribut dam using flow to Report(s) on Get	epage and pore tion through a nets [10%]	e water n earth		LO-4	30%					
	WE	End Semester Ex	kamination	, [- 0, 0]		All	70%					

	 Das, B. M. (1998). Principles of Geotechnical Engineering (4thed.). Boston: PWS.
	2. Craig, R. F. (1997). Soil Mechanics (6th ed.). E & FN Spon.
Recommended	3. Coduto, D. P. (1998). Geotechnical Engineering. Prentice Hall.
Textbooks	 Holtz, R. D. and Kovacs, W. D. (1981). An Introduction to Geotechnical Engineering. Prentice Hall.
	Blyth,F.G.H. and de Freitas, M. (1984). A Geology for Engineers (7th ed.). CRC
	Press.
Names of Lecturers	Prof. U. G. A. Puswewala, Dr. U. P. Nawagamuwa, Dr. L. I. N. de Silva

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L	L								L		
LO-2	L	L								L		
LO-3	L	L										
LO-4	Н	L	L		L					М		
LO-5	Н	L	L	L						L		L
Module	Μ	L	L	L	L					L		L
S	cale:	H – Hig	h	M – I	Medium		Ι	L – Low				

		1				
Module Code	CE2142	Module Title	Surveying II			
Credits	3.0	TT	Lectures	2.0	D	CE20(2
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisites	CE2062
Module Type:	Core Modu	le/Compulsory	Electiv	ле 🗆	Op	tional
Learning Outcon	nes (LOs)					
After completing	this module,	students should be	e able to:			
LO-1: use modern	instruments	for survey measu	rements in civil engine	ering,		
LO-2: <i>perform</i> con using manu	mputations a al methods a	nd prepare drawin nd software,	gs for civil engineerin	g works	based on surve	y measurements
LO-3: setout civil	engineering	works, and				
LO-4: use field as	tronomy for	location and time	measurements.			
Module Outline		LOs Covered				
Modern surveyin	g technique	s and instrument	s [4 h]			
Electronic distance modulation and si	e measurem imulation; To	ent (EDM): maxin otal Station (TS) t	num non ambiguous d o measure inclined dis	istance, tances,	principles of tie distances,	LO-1
Global Position S						
Satellite systems, p		LO-1				
Areas, volumes a	nd earth wo	rk calculations [4	4 h]			
Area using geome	/earthwork	LO-2				
by end-areas and	trapezoidal f	ormulae, by spot l	evel and by contours			
Lise of AutoCAD f	or surveying soi	tware [4 n]	is software for terrain	data pr	ocessina	LO-2
Tacheometry [3]	or survey pu nl	ins and 1 ymagore	is software for terrain	uuiu pro	Jeessing	
Contour map, red	uced level ca	lculation, distance	e measurement			LO-2
Setting out [4 h]						
Curve ranging (us	ing chain/tap	pe, theodolite, and	l TS), Setting out of bu	ildings,	curves,	LO-3
horizontal and ver	rtical alignm	ents				
Field Astronomy	and time [7	h]	. 11 .			
Movement of ear	th in space:	celestial sphere,	constellations, appai	ent mo	tion of stars,	LO-4
motion of sun in th	true north a he celestial si	na coorainaies, phere: Solar time	sidereal time standar	i, seusc d time	ons, appareni	
Practical Work	ie ceiesiiai sp	mere, solar line,	staereat time, standar	u nine		
1. Use of GPS	5					LO-1
2. Use of Tota	al Station					LO-1
3. Building Se	etting out					LO-3
Assignments						
1. Detail draw	ving using Gl	PS				LO-2
2. Calculation	n of setting ou	ut coordinates		2		LO-2
3. Traverse ad		LO-2				
	Category		Туре		Assessed LOs	Weightage
		Report on group fie	ldwork using GPS [5%]		LO-1	
		Detail drawing usir	g GPS measurements [59	6]	LO-2	
		Report on group fie out [5%]	ldwork on building settin	g	LO-3	
Assessments	CA	Report on calculatie	on of setting out coordina	tes	LO-2	30 %
		Competency in Tot	al Station fieldwork [5%]		LO-1	
		Report on traverse detail drawing usin	adjustment, computation g CAD software [5%]	and	LO-2	
I [WE	End Semester Exan	nination		All	70%
·I		•			•	

CIVIL ENGINEERING STUDENT HANDBOOK 2020

Recomme Textbook	ended s		1. 2.	Bannist Harlow Schofie CRC Pt	ter, A., R v: Addisc eld, W. a ress.	aymond, on Wesle nd Breac	, S. and E y Longm h, M. (2	Baker, R. nan. 007). En	(1998). gineerin	Surveyin g Survey	ng (7 th ed. ing (6 th e	.). ed.).	
Names of	Lecture	ers	Pro	f. U. G. A	A. Puswe	ewala, M	r. T. D. (C. Pushp	akumara	ι			
Mapping	of Modu	ule Lear	ning Ou	tcomes	(MLO) 1	to the Pr	ogramn	ne Outco	omes (PO	D)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	М			H M M								М	
LO-2	М	L			Н				М	Н		L	
LO-3	L				L				Μ			L	
LO-4	Н											L	
Module	Μ	L			Н				Η	Μ		Μ	
S	cale:	H – Hig	h	M – Medium L – Low									

Module Code	CE2260	Module Title	Bui	lding Des	sign Proc	ess and	Applicat	tions		
Credits	2.0		Lec	tures		1.0				
GPA/NGPA	NGPA	Hours/Week	Lab	o/Assignr	nents	3/1	Pre-req	uisites	N	one
Module Type:	Core Modu	le/Compulsory			Electiv	ve 🔽	1	Option	al 🗖	
Learning Outcom	nes (LOs)									
After completing t	his module,	students should b	e able	e to:						
LO 1: <i>discuss</i> the	basic drawi	ng equipment and	d the f	function	of them,					
LO 2: transform	2D and 3D e	elements and conv	vert 21	D to 3D a	and 3D to	o 2D for	civil eng	gineering	element	s and
LO3: discuss the	basic build	ng elements and	their l	hehavior	in a typic	al build	ina desia	an nroces	be and	
LO 3: adopt built	ding regulati	ons for the build	ng de	sign proc	ni a typic		ing uesig	gii proces	ss, and	
			ng uc	sign proc	C 35.				10.0	
Module Outline									LOs Co	overed
Introduction to 3	Engineering	g drawing equip	nent	[2 h]						
Engineering draw	ving equipm	ent and their use							LO	-1
Types of Engine	ering drawi	ngs [5 h]							LO	-2
First angle projec	ction, Third	angle projection,	Oblig	que proje	ction, Isc	ometric p	projectio	n,	20	-
Single point persp	pective, Two	point perspective	e, Thr	ee point j	perspecti	ve				
Adopt Building Foundations. Wa	design proc lls. Roof. Su	ess [5 h] stainable concept	s. Bui	ilding reg	ulations.	Finishe	es and sta	air	LO-3.	LO-4
cases	,j,		~,		,,				20 0,	
Introduction to <i>Computer aided a</i>	computer a i drafting and	ded drafting [2] its applications	h]						LO-3,	LO-4
Assignment	5 0	11								
1. Student as a	a teacher $-g$	roup presentation	on b	uilding d	esign pro	ocess			A	11
2. Preparation	of council c	rawings and 3D	pnysi	cal mode.	IS		Assesse	d .	A	1
	Category		Туј	pe			LOs		Weighta	ige
		Student as a teac	her –	group pr	esentatio	on	All			
	CA	Manual drawing	s [109	%]	70]	L	D-1 to L0	D-3	3()
		Report on assign	ment	based on	building	g	A 11		51	,
Assessments	11/15	project [10%]					A 11			
Recommended	WE	End Semester E	xamin	ation			All		/()
Textbooks		Planning and Bu	uildin	g Regula	tions, Ur	ban Dev	elopmen	t Author	ity, Sri I	Lanka
Names of Lectur	rers	Prof. R. U. Hal	watur	ra						
Mapping of Mod	lule Learni	ng Outcomes (M	LO) 1	to the Pr	ogramm	e Outco	omes (PC	Os)	DOLL	2010
PO1	PO2]	PO3 PO4 1	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LU-1 L 0-2	+		М					M		M
LO-2 LO-3	+		111	М	М	Н	L	L	L	Н
LO-4			М	M	M	H	L	L	L	Н
Module			Μ	М	Μ	Н	L	L	L	Н
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Module Code	CE3012	Module Title	Hydraulic Engineering II

Credits	3.0		Lectures	2.5							
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisit	es	CE2032				
Modulo Typo:	Coro Modu	ulo/Compulsory	Flocti	70 П	0	Intior					
Niodule Type.		ale/Compuisory	I Electiv			puor					
After completing	this module,	students should b	e able to:								
LO-1: demonstrat problems,	<i>te</i> an underst	anding of non-uni	form flow in open char	nels an	d solve related	l engi	neering				
LO-2: <i>articulate</i> parameters	LO-2: <i>articulate</i> and <i>apply</i> the theories and concept of water balance of a river basin to compute variables and parameters related to surface water hydrology,										
LO-3: <i>identify</i> the differences between types of aquifers, <i>apply</i> the relevant theories to determine aquifer characteristics and <i>analyse</i> pumping test data, and											
LO-4: <i>apply</i> basic theories of coastal hydraulics to recognise problems related to wave induced processes.											
Module Outline LOs Covered											
Non-uniform flo	w in open cl	annels [10 h]									
<i>Types of flow, flo flows, surface pro</i>	w characteri. ofiles and hyd	stics, specific ener lraulic jump	gy, sub-critical/ critica	l/ super	r-critical		LO-1				
Surface water hy Water balance, p estimation and an	ydrology [10 recipitation a nalysis of hyd	h] unalysis, stream-fl lrological extreme	ow measurement, ratio s	nal met	hod of flood		LO-2				
Groundwater hy Types of aquifers equations and an	Groundwater hydrology [7.5 h]Types of aquifers, aquifer characteristics, Darcy's Law, groundwater flow governingequations and analysis of pumping test data										
Coastal hydraul Wave theory and	ics [7.5 h] wave induce	d processes					LO-4				
Practical Work											
1. Backwater	curve and h	ydraulic jump mea	asurements using flume	; 	()		LO-1				
2. Developin	g a nyurouyn	tamic model using	, HEC-KAS (Sleady/UI	isteady	llow)	1	LO-1, LO-2				
1. Field visit	to the Meteo	rological Departm	nent				LO-2				
2. Assignme	nt on comput	er aided analysis/	lesign of open channel	flow (C	DCF)		LO-1				
3. Tutorials of	on all 4 topics	5				L I	.O-1, LO-2, .O-3, LO-4				
	Category		Туре	Α	ssessed LOs	W	eightage				
		Report on field v	visit [5%]		LO-2						
	- ·	Report on OCF 1	nodelling [5%]	Ι	.O-1, LO-2,						
Assessments	CA	Lab Class 1 (Lab	sheets and CW) [10%	1	LO-3		30%				
		Lab Class 1 (Lat	sheets and CW) [10%		LO-1. LO-2						
	WE	End Semester Ex	amination	-	All		70%				
	1. Cho	ow, V. T. (2009).	Open-channel Hydrauli	ics. Mc	Graw Hill/ Bla	ckbu	rn Press.				
D 11	2. Cha	adwick, A., Morfe	tt, J. and Borthwick, M	. (2004). Hydraulics i	n Civ	il and				
Recommended Environmental Engineering (4 th ed.). CRC Press.											
3. Subramanya, K. (1994). Engineering Hydrology (2 nd ed.). Tata McGraw Hill.											
	4. Sorensen, K. M. (1997). Basic Coastal Engineering (2 rd ed.). Springer Publication.										
Names of Lecturers	Dr. R. L. H.	L. Rajapakse, Dr.	T. M. N. Wijayaratna								
Mapping of Mo	lule Learnin	ng Outcomes (MI	.O) to the Programme	Outco	omes (PO)						

CIVIL ENGINEERING STUDENT HANDBOOK 2020

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М	М	L		М		L					L
LO-2	М	М	L	L	М	L	L					L
LO-3	М	М	L	L			М					L
LO-4	М	М	L	L								
Module	М	Μ	L	L	Μ	L	L					L
S	cale:	H – Hig	h	M – N	Medium		Ι	L – Low				

Module Code	CE3112	Module Title	Structural Analysis	II						
Credits	3.0		Lectures	2.5	D	GE0112				
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisite	s CE2113				
Module Type:	Core Mod	ule/Compulsory	Elec	tive 🗌	Oţ	otional				
Learning Outcom	mes	students should b	a able to:							
After completing	lamontala of	, students should b	es in analysing buildi	nac and l	midaaa					
LO-1: <i>utilize</i> tune	tainentais of	ifferent finite elen	es in analysing build	salact m	ost suitable eler	ments in				
modelling	statically in	determinate structu	ires,	select II	lost suitable cici	nents m				
LO-3: <i>perform</i> state the results	LO-3: <i>perform</i> structural idealization, modelling and analysis of civil engineering structures while verifying the results with basic manual calculations, and									
LO-4: <i>idealise</i> and <i>analyse</i> structures made of surfaces.										
Module Outline						LOs Covered				
Introduction to structural dynamics [8 h]										
Introduction to SDOFS/MDOFS, modelling, force	ction to modelling of structural dynamic problems, free vibration analysis – /MDOFS, calculations of modal frequencies mode shapes with lumped mass ng, force vibration analysis – SDOFS									
Theory of finite Introduction to fin functions, Pascal types of finite elem	Theory of finite element analysis [10 h] Introduction to finite element modelling (FEM), displacement interpolation and shape functions, Pascal triangle, formation of stiffness matrix and consistent load vector, different types of finite element formulations									
Application of fi Structural idealiz elements, linear a element connectiv	Application of finite element modelling [7 h] Structural idealization and modelling of bridges and buildings, use of 1D, 2D and 3D finite elements, linear and non-linear geometric analysis using FEM software, modal analysis and element connectivity									
Plates and shells Introduction to an shells, membrane	[10 h] nalysis of su	rfaces, curvature a	und twist, analysis of p	olates, ax	cis-symmetric	LO-4				
Assignments	nypointesis									
1. Group ass	ignment on o	lesign, analysis an	d testing of a structure	e made v	with non-	LO-2, LO-3,				
conventi	ional materia	al (Design Challen	ge)			LO-4				
2. Computer	based assign	ment on analysis	of a liquid storage tan	k (Mode	lling shells)	LO-3, LO-4				
	Category		Туре	A	ssessed LOs	Weightage				
Assessments	CA	Two quizzes [20 Design Challeng	%] ge [25%]]	LO-1, LO-2 LO-2, LO-3, LO-4	50%				
-	11/12				LU-3, LU-4	500/				
	WE	End Semester Ex	(amination	stant Da	All	50%				
		 Hosur, V. (20 Jaeger, L. G. [624.073.2 J3 	(13). Earthquake-Rest (1964). Elementary [3]	Theory	of Elastic Plate	structures. whey. es. Pergmon press.				
		 Timoshenko, Shells (2nd ed 	S. P. and Woinowsk .). New York: McGra	y-Kriege w-Hill. [er, S. (1959). Th 624.073.1 T5]	eory of Plates and				
Recommended Textbooks		4. Calladine, C. Press. [624.07	. R. (2007). Theory o 74.4 C3]	of Shell	Structures. Can	nbridge University				
		5. Ghali, A., N Unified Class [624.04:519.0	eville, A. M. and B sical and Matrix App 6]	rown, T roach (6	. G. (2009). St th ed.). London:	tructural Analysis: Tayler & Francis.				
	 6. Zienkiewics, O. C. and Taylor, R. L. (2000). The Finite Element Method: The Basis (5th ed.). Oxford: Butterworth Heinemann. [624.04Z5] 									

Names of	Lecture	ers	Prof. Dr. H	Prof. I. R. A. Weerasekera, Dr. C. S. Lewangamage, Dr. H. M. Y. C. Malliakrachchi									
Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	М	L			L							L	
LO-2	Н	L			Н							L	
LO-3	L	Н	М	М	Н				М	M		Н	
LO-4	Н	М			Н							L	
Module	Н	Μ	L	L	Н				L	L		Μ	
Scale: H – High M – Medium L – Low													

Module Code	CE3122	Module Title	Design of Masonry	y and Timber Structures						
Credits	3.0		Lectures	2.0	D	GE0112				
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es CE2113				
Module Type	Core Mod	ule/Compulsory	✓ Elec	tive 🗖	0	ptional				
Learning Outcor After completing	nes (LOs) this module,	students should b	e able to:							
LO-1: convince a	client on the	merits of masonr	v and timber in const	ruction.						
LO-2: propose alt	ternative solu	tions for a client'	s brief and <i>justify</i> the	selection	of a particula	solution.				
LO-3: assess the i	magnitude of	loads and <i>identif</i>	v load paths in a struc	ture. and		· · · · · · · · · · · · · · · · · · ·				
LO-4: <i>prepare</i> str	uctural calcu	lations adopting r	elevant design standa	ırds.						
		1 0	0							
Module Outline						LOs Covered				
Use of timber as <i>The structure of the</i> <i>limitations to size</i>	a structural imber, a natu	material [2 h] <i>aral material, the of durability and</i>] he effects of moisture, growth characteristics, LO-1, LO- ind treatability							
Design of timber	members su	ibject to tension	compression and be	nding [6	h]					
Strength properties of timber, elements of a structure and how they perform, different LO-3, LO-4										
failure modes and	failure modes and how safety is ensured using Eurocode 5 as an example code									
in timber connect	ions and how	to determine eith	ter the size/number of	f nails/bo	lts	LO-4				
Use of Masonry	as a structur	al material [4 h]	U			101102				
Introduction to di	fferent types	of masonry and th	he strengths			LO-1, LO-2				
Design of load be	earing maso	nry for vertical ,	ateral and in-plane	loads [6	h] ds and the	102104				
way structural de.	masonry wne sign can be n	en subjectea to als performed using E	urocode 6 as an exan	nple code	as ana ine	LO-2, LO-4				
Design of infill m	asonry pan	els [4 h]		7						
The design of mas	sonry walls s	ubjected to latera	l loads when behaving	g as wall	panels,	LO-2. LO-4				
resisting loads us	ing arching c	iction and also be	having as free standi	ng walls	using	20 2, 20 1				
<i>Eurocoae</i> o <i>as an</i>	example coa	e								
1. Design of '	Timber struc	tures				All				
2. Design of 1	Masonry stru	ctures - Quiz 1 -	vertically loaded wall	s		LO-2, LO-3,				
3. Design of	Masonry stru	ctures - Quiz 2 - 1	aterally loaded walls			LO-3. LO-4				
Category Type Assessed LOs V										
	Category		ounced quizzes	11350	33CU 1103	Weightage				
		[20%]	iounced quizzes	LO	-3, LO-4					
Assessments	CA Individual and C Assignments (ir	and Group nts (in class and take		All	40%					
	WE	nome) [20%]	Examination		A 11	60%				
	WE	End Semester	Examination		All	00%				

		1.	McKen Red Gl	zie, W.N obe Pres	M.C. (20 s.	13). Desi	gn of St	ructural	Element	s to Euro	codes (2	nd ed.).		
		2.	Drayco Buttery	ott, T. and vorth-He	d Bullma einemanr	an, P.(200 1.	09). Stru	ctural El	ements I	Design M	lanual (1	st ed.).		
		3.	Manua	l for the	design o	f timber	building	structure	es to Eur	ocode 5	(2007).			
		4.	Institut Larsen	10n of St . H. and	ructural Eniily, V	Engineei V. (2009)	rs. TRAI	DA. al design	n of timł	oer struct	ures to F	Eurocode		
Recomme	ended		5. Thomas Telford.											
Textbook	S	5.	5. Porteus, J. and Kermani A. (2007). Structural Timber Design to Eurocode 5. Blackwell Publishing											
		6.	6. EN 1996-1-1 2004: Eurocode 6: Design of masonry structures - Part 1-1: General											
		7	rules for reinforced and unreinforced masonry structures. 7 McKenzie WMC (2015) Design of Structural Elements to Eurocodes Palgrave											
		7.	 Arya, C. (2009). Design of Structural elements: Concrete, Steelwork, Masonry and 											
		0.	Timber Designs to British Standards and Eurocodes (3 rd ed.), London: Taylor and											
			Francis.											
		9.	9. Designers' Guide to Eurocode 6:Design of Masonry Structures En 1996-1-1											
			Institut	ion of C	ivil Engi	neers (IC	Ъ.		5					
		10	. Manua	l for the	design o	f plain m	asonry i	n buildir	ig structi	ures to E	urocode	6		
			(2008).	IStructE										
Names of Lecturers	5	Prof. M	I.T.R. Jay	yasinghe	, Dr. (Mi	rs.) M. T	. P. Hett	iarachchi	i					
Manning	of Mod	ule Lear	ning Au	tcomes	(\mathbf{MLO})	to the Pr	ogramn	ne Outco	mes (P	0)				
mapping	01 10100	uic Dear	ining Ou	teomes	(01120)	to the FI	ogramm		Jines (1 v	0)				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
LO-1	L		L			L	L					L		
LO-2	L		М			L	L			Μ				
LO-3	М								М					
LO-4	Н		Н							М		L		
Module	Module M L L M L													
S	Scale: H – High M – Medium L – Low													

Module Code	CE3132	Module Title	Geotechnical E	nginee	ering						
Credits	3.0		Lectures	0	2.5						
	CDA	Hours/Week	Lectures	nta	2/0	Pre-requisit	es	CE2132			
GPA/NGPA	GPA		Lad/Assignme	nts	3/2						
Module Type:	Core Mod	ule/Compulsory		Electiv	ve 🗖	(Option	nal			
Learning Outcom	mes (LOs)										
After completing	this module,	students should b	e able to:								
LO-1: propose an	appropriate	geotechnical inve	stigation for a civ	il eng	ineerin	g project,					
LO-2: apply the s	hear strength	n concept in geotee	chnical problems,	,							
LO-3: <i>assess</i> the of failed sl	stability of e opes,	xisting slopes, des	<i>sign</i> new cut or fil	l slop	es and j	propose metho	ds foi	r rectification			
LO-4: explain the basic mechanical and physical behaviour of rock masses, and											
LO-5: <i>design</i> rock slopes.											
Module Outline	Module Outline LOs Covered										
Geotechnical investigations [3 h]											
Methods of geoted coring in rock, in idealization of a s	chnical inves situ tests, n	tigation, methods nethods of obtaining ith borehole data	of advancing a bo ng undisturbed so	orehol ample.	le in soi s, borei	il, methods of hole logging,		LO-1			
Shear strength of soils [10 h]											
Relevance of shear strength of soils, Mohr - Coulomb failure criterion, drained and											
undrained conditi	ions, determi	ination of shear st	rength in the labo	oratory	v by dir	ect shear test		LO-2			
and triaxial tests	, applicabili	ity of different ty	pes of triaxial te	ests, p	ore wa	ater pressure		202			
strength of unsatu	skempton s l trated soils	aw, stress invaria	nts ana stress pat	ns, va	ine snee	ar test, snear					
Stability of soil s	lopes [10 h]										
Different modes	of slope	instability, drain	ied and undrai	ned l	behavid	our, shallow					
translational slide	es, analysis o	of rotational slides	s by friction circle	e meth	od, Ta	vlor's charts,		LO-3			
Bishop and Morg	enstern char	ts, ordinary slices	method, Bishop's	metho	od of sl	ices, concept					
Of probability of f	[12 h]	uzation of stopes									
Rock mass and ro	ck material.	discontinuities. ro	ck mass classifica	tion. i	nvestig	ation in rock.	_				
orientation of disc	continuities,	stereo-plots, stabi	lity of rock slopes	s: plan	ne failu	re and wedge	I	LO-4, LO-5			
failure; stabilizat	ion of rock s	lopes		•	Ū	C					
Practical Work											
1. Direct shea	ar test							LO-2			
2. Triaixial sl	hear test							LO-2			
5. Tests off fo	DCKS							LU-4			
1 Design of	an earth fill (on soft clay					LO	-5 of CE2132			
2. Computer	aided slope s	stability analysis					20	LO-3			
1	Category	Ty	vne		Assess	sed LOs	We	eightage			
		Unannounced qu	iz [10%]	L	0-1. L	0-2 LO-3		8			
		Report on design	of an earth fill	I	LO-5 of	f CE2132					
Assessments	CA	Report on computer assignment on sl	uter aided ope stability		L	0-3		30%			
		Report(s) on Lab	Classes [10%]		LO-2	, LO-4					
	WE	End Semester Ex	kamination			A11		70%			
			-								

	Boston: PWS.	ering (4"ed.).
	2. Craig, R. F. (1997). Soil Mechanics (6th ed.). E & FN	Spon.
	3. Coduto, D. P. (1998). Geotechnical Engineering. Pren	tice Hall.
Recommended Textbooks	 Holtz, R. D. and Kovacs, W. D. (1981). An Introducti Geotechnical Engineering. Prentice Hall. 	on to
	 Hoek, E. and Bray, J. (1981). Rock Slope Engineering London: Inst. of Minning and Metallurgy. 	g (3 rd ed.).
	 Clayton, C. R. I., Matthews, M. C. and Simons, N.E. Investigations (2nded.). Oxford: Blackwell Science. 	(1995). Site
Names of Lecturers	Prof. U.G.A. Puswewala, Prof. S. A. S. Kulathilaka, Dr. L. I. N	J. De Silva
Mapping of Module Learni	Outcomes (MLO) to the Programme Outcomes (PO)	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L	Н	L			L						
LO-2	Н	Н			М				L	L		
LO-3	Н	Н	Н		Н					М		
LO-4	L											
LO-5	Н	L	Н		М							
Module	Н	Μ	Μ		Μ	L			L	L		
S	cale:	H – Hig	h	M – N	Medium		I	L – Low				

Module Code	CE3142	Module Title	Construction Management								
Credits	3.0		Lectures	2.5	-	CE1132					
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisit	cE2052					
Module Type:	Core Mod	ule/Compulsory	✓ Electiv	ле 🗖	C	ptional					
Learning Outco After completing	omes (LOs) this module,	students should b	e able to:								
LO-1: <i>demonstra</i> contract ir	<i>te</i> an underst cluding CID	anding of the lega A standard bidding	l aspects of construction g documents for procur	n contr ement	acts and <i>use</i> va of construction	arious forms of 1 works,					
LO-2: <i>apply</i> qual at construct	ity managem	ent, work study, n el in order to impro	naterials management, g	good h e,	ousekeeping, a	nd lean construction					
LO-3: <i>manage</i> co project and	onstruction ec d company le	quipment including	g selection, acquisition,	maint	enance, and rep	placement at both					
LO-4: <i>perform</i> ca health of a	ash flow anal	ysis based on sche	edule and cost estimate	and <i>ex</i>	<i>amine</i> its influe	ence on the financial					
LO-5: evaluate h	LO-5: <i>evaluate</i> health and safety risks at construction sites and recommend preventive actions.										
Module Outline						LOs Covered					
Law of Contract Introduction to L	t and Contra aw of contra	ct administration ct, Contract admir	n [10 h] nistration			LO-1					
Construction que Quality managem	ality and sit	e Management [1 ruction, introduction	l 0 h] on to work study, site m	anagei	ment	LO-2					
Construction equ	uipment [5]	n] gement				LO-3					
Cash flow mana Cash flow foreca	gement [5 h] sting and ma] nagement				LO-4					
Construction He Health and safety	ealth and Sat	fety [5 h] ion				LO-5					
Assignments											
Report on contract	ct administra	tion, work study a	nd cash flow forecasting	g		LO-1, LO-2, LO-4					
	Category		Туре	A	ssessed LOs	Weightage					
		In-class quiz on management [5%	equipment and site 6]		LO-3, LO-2						
Assessments	CA	In-class quiz on	construction safety [5%	6]	LO-5	30%					
-		Report on contra study and cash fl	ct administration, work	k LO-1, LO-2, LO-4							
	WE	End Semester Ex	All	70%							
Recommended		 Harris, F. and McCaffer, R. (2013). Modern Construction Management (7th ed.). West Sussex: John Wiley & Sons, Ltd. 									
Textbooks		2. Griffith, A. and Watson, P. (2004).Construction Management: Principles and Practice. New York: Palgrave Macmillan.									
Names of Lecturers Prof. A.A.D.A.J. Perera, Dr. C.S.A. Siriwardana											

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М	М				Н		Н	L	L	М	L
LO-2	L	М		L	М	М				L	Н	М
LO-3		L				L	L				Н	М
LO-4		М			М					L	Н	М
LO-5			L	L		Н		М	L	L		М
Module	L	М	L	L	Μ	Н	L	Μ	L	L	Н	М
Scale: H – High M – Medium L – Low												

Module Code	CE3152	Module Title	Fundamentals of Env	vironme	ntal Engineering							
Credits	2.0		Lectures	15								
	CDA	Hours/Week		2/2	Pre-requisites	None						
GPA/NGPA	GPA		Lab/Assignments	3/2								
Module Type:	Core Modu	ule/Compulsory	✓ Elect	ive 🗌	Opt	ional 🗖						
Learning Outcom	nes (LOs)											
After completing	this module,	students should b	e able to:									
LO-1: convince a	client about	the need for conse	ervation of resources in	n a proje	ect to be undertak	en,						
LO-2: <i>analyse</i> a g related prol	iven scenari blems such a	o based on key en is water, air and so	vironmental concepts a bil pollution, and	and <i>pro</i>	pose solutions to	environment-						
LO-3: <i>assess</i> the ractions.	magnitude of	f environmental co	onsequences related to	human	activities and pro	ppose mitigatory						
Module Outline						LOs Covered						
Introduction [1.5 Introduction to Er	h] ivironmental	l Engineering				LO-1						
Principles of Eco Introduction to Eco	oiects	LO-1, LO-2										
Sustainability an	d developm	ent [3 h]	John Street									
Sustainable Devel	lopment Goa	ls (SDG), resourc	e constraints and Eart	h's life	support	LO-1, LO-2						
system, global env	vironmental	issues										
Concepts of Envi	ironmental	Management [1.5	5 h]			LO-1. LO-3						
Environmental qu	ality manag	ement, risk assess	ment			- ,						
Pollution due to n	oise and vib	control [3 n] ration and its con	trol			LO-2, LO-3						
Air pollution and	l its control	[1.5 h]										
Air pollution due	to constructi	on projects and it	s control			LO-2, LO-3						
Surface and grou	indwater po	ollution and its co	ontrol [3 h]									
Introduction to su	urface and g	groundwater, wat	er quality, objectives,	and m	easurements,	1.0-2 1.0-3						
water pollutants,	sources of p	ollution, indicato	rs of pollution, water	quality	issues, water	20 2, 20 0						
pollution control	oue weste n	anagamant [2 h]	1									
Introduction to so	lid and haza	rdous waste oene	I pration of waste hierau	rchy of y	waste	1.0-2 1.0-3						
management, deta	iled steps ar	id approach of an	integrated waste man	agemen	t plan	10 2, 10 3						
Environmental I	mpact Asse	ssment [1.5 h]	0	0	1	101102						
Introduction to El	A, National	Environmental Ac	ct and other Environme	ental reg	gulations,	LO-1, LO-2						
nature of projects,	, identificati	on of impacts, mit	igation of negative imp	pacts		LO-3						
Practical Work												
1. Field samp	ling and in s	atu measurement	of water quality param	eters		LO-2						
2. Laboratory	experiment	on measurement	of water quality param	eters		LO-2						
3. Noise and	vibration me	easurements for a	piling exercise			LO-2, LO-3						
Assignments	C 1	· 1· · · ·	1 1 4 4 4			101101						
1. Identificati	on of enviro	number of a constant of a cons	nevelopment project	valorm	ant project	L0-1, L0-2						
∠. identificati	on or enviro	innentai legisiatio	in/ regulations for a de	velopme	ent project	L0-1, L0-2						
3. Tutorial (D	3. Tutorial (Discussion sessions) LO-1, LO-2 LO-3											

		Categor	y		T	ype			Assessed	LOs	Weig	ghtage		
	Γ		Rep	ort based	l on Prac	ctical 1 a	nd 2 [10	%]	LO-2	2				
			In-c ecol proj	lass assig ogical in ect [5%]	gnment of npacts of	on identif f a develo	fication of the second se	of	LO-1, L	O-2	30	%		
Assessme	ents	CA	Rep of n	ort based oise and	l on mea vibratio	suremen n [10%]	t and coi	ntrol	LO-2, L	0-3				
			In-c envi a de	lass assig ronment velopme	gnment o al legisla nt projec	on identif ation/ reg ct [5%]	fication of gulations	of for	LO-1, L	O-2				
		WE	End	Semeste	er Exami	nation			All 70%					
Recommo Textbook	ended s			1. Da Er 2. M (2)	avis, M. 2 ivironme iller, G. ' 0 th ed. or	L. and C ental Eng T. and Sj latest ve	orwnwel ineering poolman rsion). C	ll, D. A. (5 th ed. , S. (20 Cengage	(2012). l). Science 19). Livir Learning	Introduct Enginee ng in the I g, Inc.	ion to ering & N Environr	Iath. nent		
Names of	Lectur	ers	Pro Dr.	Prof. M. W. Jayaweera, Prof. J. M. A. Manatunge, Dr. (Ms.) W. B. Gunawardana										
Mapping	of Mod	lule Lear	ning Ou	tcomes	(MLO) 1	to the Pr	ogramn	ne Outo	comes (P	0)				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
LO-1						М	Н	М	L	L		L		
LO-2	L	L		М	Н	Н	М	М		L		L		
LO-3	L	L	М			М	М	М		L		L		
Module	L	L	L	М	Μ	H	Н	Μ	L	L		L		
S	cale:	H – Hig	h	M – 1	Medium		I	L – Low	7					

Module Code	CE3162	Module Title	itle Fundamentals of Transportation Engineering									
Credits	2.0		Lectures	1.5	D	N						
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisite	s None						
Module Type:	Core Mod	ule/Compulsory	▼ Electiv	ve 🗆	0]	ptional						
Learning Outco	omes (LOs) g this module.	students should b	e able to:									
LO-1: <i>express</i> b	asic traffic flo	ow theory to <i>descr</i>	<i>ibe</i> traffic flow conditions	ons and	recognize the a	ppropriateness of						
LO-2: <i>identify</i> b	asic elements	in highway planni mand based on giv	ing, <i>describe</i> transport	plannin	g process, <i>ident</i>	tify its importance						
LO-3: <i>discuss</i> th	e importance	of transportation s	systems management for	or vario	us modes of tra	nsport, and						
$I O_{-4}$: discuss the	e importance	of safety socio-ec	conomic environmenta	l consid	derations and su	ustainable						
developm	ents in transp	ortation systems.	cononne, environmenta	ii consid		istamable						
Module Outline	e					LOs Covered						
Introduction [1	.5 h]	stoms impacts de	sired features role of t	ranspor	*t	I O-3						
professionals	f transport sys	siems, impueis, ae	strea jeatures, rote of th	unspor	ı	LO-5						
Transport Fun	ction and Tra	ansportation Syst	em Management [3 h]]								
Need for transpo	ort, accessibil	ity and mobility, d	, and mobility, different transport modes and									
transportation s	ystems manag	ement										
Traffic Flow th	eory [1.5 h]	amanta data hand	lling anglugia and inter			LO-1						
Speed, flow & dd	ensily measur	Planning [6 h]	ung, analysis and inter	preiaii	on							
Planning proces	ses trin gene	ration & attraction	n trin distribution mod	del solit	trin	10-2						
assignment	ses, inp gene	anon a annaeno	i, inp distribution, mod	iei spiii	,	202						
Transport Safe	ty [3 h]											
Concept of safet	y and risk, saj	fety management,	driver behaviour and h	uman f	actors,	LO-3, LO-4						
human error, ov	erview of roa	d safety in Sri Lan	ka, risk mitigation									
Sustainable dev	elopment an	d environmental	considerations [3 h]	, ,• •,	• .1 .	102104						
Sustainable deve	elopment of tr	ansport infrastruc	tures, transport related	l activit	ies that	LO-3, LO-4						
Transport Infr	astructure [3	hl	e impucis una counierm	ieusure.	8							
Process of devel	opment, basic	elements of high	vav planning, airport a	nd rail	transport	LO-2						
infrastructure, n	ew transport	infrastructure dev	elopments		1							
Practical Work												
1. Debates of	on transport re	elated topics				LO-1 to LO-3						
2. Field visi	t to transport	development proje	ect(s)			LO-2 to LO-4						
Assignments												
1. Assignme	ent on traffic o	data analysis				LO-1						
2. Assignme	ent on Transp	ort Systems				LO-3						
3. Assignme	ent on Safety/	Environment				LO-4						
	Category		Туре	Α	ssessed LOs	Weightage						
		Report on Assig	nment 1 [6%]		LO-1							
		Report on Assig	nment 2 [6%]		LO-3							
		Report on Assig	nment 3 [6%]		LO-3							
Assessments	CA	Debates [10%]		I	.O-2 to LO-4	40%						
		Ouiz [6%]		1	0-1 to LO-3							
		Field visit report	[6%]	I	O-2 to LO-4							
	WE	End Semester Ex	kamination		All	60%						
	•	•			1							

Recomme Textbook	ended s		1. Ka De	 Kadiyali, R. L. (2007). Traffic Engineering and Transport Planning (7th ed.). Delhi: Khanna Publishers. 											
Names of Lecturers	5		Prof. J. Dr. G. 1	M. S. J. L. D. I. I	Bandara De Silva	, Dr. H.	L. K. Per	rera, Dr.	H. R. Pa	isindu,					
Mapping	of Mod	ule Lea	arning Ou	ing Outcomes (MLO) to the Programme Outcomes (PO)											
	PO1	PO2	PO3	D3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12											
LO-1	М	L	М												
LO-2		М			L	L	М								
LO-3						М	М	L	Н	Н		М			
LO-4						М	Н	L	L	М					
Module	L	Μ	L		L	Μ	Μ	L	М	Н		L			
S	cale:	H – Hi	I – High M – Medium L – Low												

Module Code	CE3912	Module Title	Survey Camp							
Credits	2.0	Harry (Waala	Lectures		-	Drug		Nama		
GPA/NGPA	NGPA	Hours/ week	Lab/Assignmen	ts	2 weeks	requis	ites	None		
Module Type:	Core Mod	ule/Compulsory	▼ E	Electi	ve 🗖	()ptioı	nal		
Learning Outcom	mes (LOs)	atudanta ahauld h	a abla tar							
LO-1: use of an	uns module,	veving instrument	e able to: s and surveying sc	oftwa	re					
LO-2: organize	and <i>execute</i>	surveying for a civ	vil engineering pro	oiect.	10,					
LO-3: demonstr	ate teamwor	k and nurture lead	ership qualities.	.jeet,						
LO-4: <i>apply</i> apr	propriate surv	veving principles a	and solve engineer	ing n	oroblems, and	l				
LO-5: demonstr	ate written a	nd oral communic	ation skills.	<i>0</i> r						
							-	0 0 1		
Module Outline							L	Os Covered		
Work schedule fo	ice work									
Preliminary site	nspection le	iayj vel traverse (usin	o Level instrument	E_{X}	istino level d	ata				
collection: cross	section (CS)	and longitudinal	section (LS), booki	ng oj	f data, error	circi	I	lo-1, lo-2,		
correction and di	stribution, of	fice work (design	of vertical alignm	ent, f	formation lev	el, cut	Ι	LO-3, LO-4		
and fill volume es	timation, LS	and CS drawings	, report preparatio	on)						
Site reconnaissan	i a Terrain	1 day] averse station ide	ntification travers	e 5111	wev error					
correction and di	stribution, ta	cheometric const	int validation, tack	heom	vey, error etric survey (using	Ι	lo-1, lo-2,		
Theodolite instru	ment), office	work (determinat	ion of drawing sca	le, p	lotting topogi	raphic	I	LO-3, LO-4		
<i>contour map)</i>	0 D 1	1 64 1 1								
Introduction to P	t a Benchma recise Level	irk [1 day]	recise levelling pro	ncedi	ure establish	ment of				
level of a benchm	ark using Pr	ecise Level, office	work (reduced lev	vel co	lculation)	mena oj		LO-1,LO-4		
Differential Glo	oal Positioni	ng System (DGP	S) and Drone sur	veyi	ng [0.5 days]					
Introduction to D	GPS and Re	al Time Kinematic	(RTK) surveying,	dem	onstration of	.f	I	LO-1, LO-4		
aerial manning n	eying proced rocedure usi	ng Unmanned Aer	io arone surveying ial Vehicle (UAV)	g, aei / Dro	monstration c me	Ŋ				
Group Project [6.5 days]			2.0						
Reconnaissance s	urvey, locati	ng topographic fe	atures, project for	mula	tion,establis	hment				
of benchmarks, co	ontrol traver	se survey (using T	otal Station (TS) i	nstru	ment and Lev	vel	T	0-1 L0-2		
(using TS instrument)	un aata coue vent)-office v	vork (project disci	g the contour map, ission alternative	setti anal	vsis nrelimir	n pian 1arv	-	02104		
feasibility studies	(technical, e	environmental, eco	onomic), traverse d	adjus	tment compu	tation,	L	20-3, L0-4,		
calculation of sta	tion coordin	ates, field data con	npilation, contour	· map	developmen	t using		LO-5		
computer aided a	esign (CAD)	software, design	drawings, report p	orepa	ration, prese	ntation				
preparation), jind	u presentatio	$\mathbf{D} = \mathbf{C}$	11							
Application of CA	Design (CA	AD) sontware [1.5 Autodesk Civil3D	daysj 9. Pythagoras, Sur	fer				LO-1		
Field Astronomy [0.5 days]										
Discussion on fie	ld astronomy	, use of software i	o observe celestia	l boa	lies, determin	ation	I	LO-1, LO-4		
of true north, idea	ntification of	constellations								
Practical Work							-			
1. De	sign of a Roa	ad profile					I I I	.0-1, LO-2, .0-3, LO-4		
	11.1	ст:					I	.0-1, LO-2,		
2. Est	ablishment o	or a Terrain					Ι	LO-3, LO-4		
3. Est	ablishment	of a Benchmark					I	LO-1, LO-4		
4. Gr		.U-1, LU-2,								
L							LU-	J, LO-4, LO-J		

		Categor	y		T	уре			Assessed	LOs	Weig	ghtage
			Des	ign repoi	t and LS	and CS	drawing	s on	LO-1, LO	D-2,		
			desi	gn of a r	oad prof	ile [10%]]		LO-3, L	0-4		
			Тор	ographic	contour	map fro	m		LO-1, LO	D-2,		
			esta	blishmen	it of a ter	rain [10	%]		LO-3, LO	0-4		
			Con	nputation	of redu	ced level	ofa		LO-1, LO	J-3,		
			ben	chmarkus	sing Prec	cise Leve	el [5%]		LO-4			
			Indi	ing up of vidual [5	surveyi [%]	ng instru	ments –		LO-1	-		
			Esta Indi	ıblishmeı vidual [5	nt of red	uced leve	els –		LO-1, L	O-4		
		CA	App [5%	lication	of Total	Station –	- Individ	ual	LO-1, L	O-4	100)%
Assessme	ents	en	Mea	suring a vidual [5	ngles usi [%]	ng Theo	dolite –		LO-1, L	0-4	100	//0
			Car	ry outa g	iven task	usingar and surv	propriate	e	LO-1, LO	D-2,		
			inst	ruments -	– Individ	lual [5%]]		LO-4	Ļ		
			Gro	up proiec	et report.	presenta	ation and	viva	LO-1, LO	D-2,		
			[509	~ %]	···· · · · · · · · · · · · · · · · · ·	F			LO-3, LO)-4,		
	-	WE	End	Semeste	r Evami	nation			LO-5)		
		WL.	Lind	1 Ban	nister A	A Ravm	ond S	and F	Baker R (1998)	Surveying	(7 th ed)
				Har	low: Ad	dison We	esley Lor	ngmar	1.	1770). (Surveying	(, ca.).
				2. Sch	ofield, V	V. and Bi	reach, M	. (200	7). Enginee	ering Su	rveying (6 th ed.).
Recomme	ended '	Textbooks	5	CRC Press.								,
				3. Grant S. (2019). Setting Out for Construction: A Practical Guide to								le to Site
				Sur	veying. (Costello	House P	ublish	ing.			
Names of	Lectu	rers	P	rof. U. C	G. A. Pu	swewala	, Dr. U. I	P. Nav	vagamuwa,	,		
			Ν	/Ir. T. D.	C. Pushj	pakumar	a					
Mapping	of Mo	dule Lear	ning Ou	tcomes	(MLO) 1	to the Pr	ogramn	ne Ou	tcomes (P	0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 PO9	PO10	PO11	PO12
LO-1	Н		L		Μ							М
LO-2	L	Н	М	L	М	М	М	Μ	М		М	Н
LO-3									Н			Н
LO-4	Н	М	М	М	Н		М	L				М
LO-5		М		М					М	Н		М
Module	Н	Н	Μ	Μ	Н	L	Μ	L	Η	Μ	Μ	Н
S	cale:	H – Higl	h	M - N	Medium		Ι	L – Lo	W			

Module Code	CE3992	Module Title	Industria	l Training								
Credits	6.0	Duration	Minimu	m of 16 weeks	Pre-re	anisites	None					
GPA/NGPA	NGPA	2 41 41 011	weeks)	tole up to 20		quisites						
Module Type:	Core Modu	ule/Compulsory	V	Elective		Op	tional					
 After completing this module, students should be able to: LO-1: study organization in which trainee is undergoing training with respect to the work carried out, organizational structure, stakeholders, past/ future changes, strategic planning, its business practices and financial management, economic viability and sustainability, LO-2: recognise the health, safety and environmental (HSE) polices adapted, HSE issues at the training place, risk management/ emergency response and best practices adopted at the training place, LO-3: demonstrate the technical, teamwork, and managerial skills developed through the training at the worksite or design office, and LO-4: reflect and report on the economic, environmental, social, and cultural impacts of the projects and project environment exposed to during the training. 												
				(Wee	ks)	LOs Covered						
		Areas of Exposur		Min	Max							
A. Study the deta Financial mar Project brief/I with safety of	ails of the Or agement pro Health and S ficer about s	ganization (SWO ocedure/Economic afety policy and p afety at work	T Analysis al viability ractices/Sa	/Annual reports)/ / and Sustainability/ ffety plan/Discussion	2	3	LO-1, LO-2, LO-4					
B. Study of Con documentatio statement/Eva project progre	tract/Tender n; tender pro luation of m ess monitorin	documents, prepa cedures and evalu ethod statement/P g method	ration of te ation/Prep reparation	echnical aration of method of BOQ/Study	2	3	LO-3					
C. Study of worl	k site proced	ures/Site planning	g/Safety pr	actices	1	2	LO-2, LO-3					
D. Surveying, le	velling, and	setting out /Desig	n office pr	actices	1	2	LO-3, LO4					
E. Study of cons building servi manuals	struction mat ces/Finishes	erials/Study of con /Familiarization of	nstruction f design so	equipment/Study of ftware and/or design	1 2	3	LO-3, LO-4					
F. Design office design engine	practices/As er	sist design engine	eers/Discus	ssion with a senior	2	3	LO-3, LO-4					
G. Assist in cons sub-contractor	truction supers payments,	ervision, Assist in assist in claims fo	interim va or variatior	luations: assist in	3	4	LO-3, LO-4					
H. Construction	Design of st	ructures or any civ	vil enginee	ring infrastructure	5	7	LO-2, LO-3, LO-4					

	C	ategory			T	ype		А	ssessed	LOs	Wei	ghtage
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				2. Roy, Hall	C. (2000	5). Adva	nced Coi	nstructio	n Techno	ology (4t	hed.). Pr	entice
				 Char deliv 	les, J. K. very (4the	(2016). ed.).Wile	Sustaina y.	ble Cons	struction	: green b	uilding d	lesign and
Recomme Textbooks	nded s			4. Man Engi	nering, F neering a	. L. and and Traff	Washbur fic Analy	rn, S.S. (vsis (5the	2013). P ed.).	rinciples	of High	way
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6. Thilakasiri, H. S. Construction and Testing of Piles.												
				7. CID.	A Public	ations.						
				8. ICE.	Civil En	gineerin	g Proced	lure (6th	ed.). Tho	mas Teli	ford.	
Names of	Lecture	ers]	Dr. K. Ba	ıskaran, I	Eng. T. A	A. Gamag	ge				
Mapping	of Mod	ule Lear	ning Ou	itcomes	(MLO) t	to the Pr	ogramn	ne Outco	omes (PO	D)		
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LO-2	L					Н	Н	М	L	L		М
LO-3	L	L	L		L	М	Μ	L		Μ	L	Н
LO-4							М	L	Н	L	L	Н
Module	L	L	L			Н	Η	Μ	Η	Η	Μ	Н
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Module Code CE4012 Module Title Design of Concrete Sururus II Credits 3.0 Hours/Week Lectures 2.0 Pre-requisites CE2122 GPA/NGPA GPA V Image: Second														
Credits 3.0 Hours/Week Lectures 2.0 Pre-requisites CE2122 Module Type: Core Module/Compulsory Image: Core Core Core Module/Compulsory I	Module Code	CE4012	Module Title	e Title Design of Concrete Structures II										
GPA/NGPA GPA Hours/Week Lab/Assignments 3/1 Pre-requisites CE2122 Module Type: Core Module/Compulsory Image: Core Core Core Core Module/Compulsory Image: Core Core Core Core Core Core Core Core	Credits	3.0		Lectures		2.0		000100						
Module Type: Core Module/Compulsory Image: Construction Optional Learning Outcomes (LOS) After completing this module, students should be able to: LO-1: analyse a reinforced concrete water tank by modelling and evaluate internal forces/moments in different structural elements, of a water retaining structure for serviceability limit state of crack control and ultimate limit state in accordance with BS and Euro Codes, LO-2: design structural elements of a water retaining structure for serviceability limit state of crack control and ultimate limit state in accordance with BS and Euro Codes, LO-3: specify suitable materials and appropriate construction methods for construction of water retaining structures to achieve the expected performance and durability during the lifespan of the structure, LO-4: reflect on basic design principles in designing pre-stressed concrete elements, and LO-5: apply theories to design of water retaining structures [2 h] Types of water retaining structures, available design codes, analyse different structural elements in a water tank LO-1, LO-2 Canching of concrete [2 h] Types of cracks, principles of crack formation, significance of crack width on water LO-2, LO-3 Tightness, controlling of crack widths due to structural effects [4 h] Calculation of crack widths due to structural effects [4 h] LO-2, LO-3 Calculation of crack widths due to structural effects [2 h] LO-2, LO-3 LO-2, LO-3 Tightness, controlling of crack spacing, sprinkinkage in inmature concrete, crack distrintunon, histo	GPA/NGPA	GPA	Hours/Week	Lab/Assignm	nents	3/1	Pre-requisites	CE2122						
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Joints in water retaining structures [2 h]LO-1, LO-3Expansion, contraction, hinged, sliding and construction joints, design of movement jointsLO-1, LO-3Basic principles and methods of pre-stressing, materials for pre-stressing [4 h]LO-4Introduction, historical development, basic concepts, types of prestressing, constructionLO-4methods, materials and equipment, applicationsLO-5Design of flexural members for serviceability and ultimate limit states [8 h]LO-5Design of prestress considering service and transfer conditions, checks for ultimate limitLO-5state requirements (flexural strength and shear resistance)LO-5Pre-stress losses [2 h]LO-5Estimation of prestress losses (short term and long term)LO-5Practical WorkAll1. Tutorial classesAllAssignmentsLO-1, LO-2, LO-32. Design of a water retaining structure (A group assignment, where students have to model a tank using a computer software, analyse and then design structural elements)LO-1, LO-2, LO-32. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam)LO-4, LO-5	distribution, critic	al steel ratio	o, crack spacing, c	crack width, res	traint fa	ictors								
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Design of flexural members for service ability and ultimate limit states [8 h] LO-5 Design of prestress considering service and transfer conditions, checks for ultimate limit states [8 h] LO-5 Pre-stress losses [2 h] LO-5 Estimation of prestress losses (short term and long term) LO-5 Practical Work All 1. Tutorial classes All Assignments LO-1, LO-2, LO-3 1. Design of a water retaining structure (A group assignment, where students have to model a tank using a computer software, analyse and then design structural elements) LO-4, LO-5	methods material	s and equin	pmeni, busic conc nent_applications	epis, types of p	restress	ing, co	nstruction	L0-4						
Design of inclution inclusion for set viccation of prestress considering service and transfer conditions, checks for ultimate limit LO-5 Pre-stress losses [2 h] LO-5 Practical Work All 1. Tutorial classes All Assignments LO-1, LO-2, LO-3 1. Design of a water retaining structure (A group assignment, where students have to model a tank using a computer software, analyse and then design structural elements) LO-1, LO-2, LO-3 2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam) LO-4, LO-5	Design of flexura	l members	for serviceability	and ultimate l	limit sta	tes [8]	hl							
State requirements (flexural strength and shear resistance) LO-5 Pre-stress losses [2 h] LO-5 Estimation of prestress losses (short term and long term) All Practical Work All 1. Tutorial classes All Assignments LO-1, LO-2, LO-3 elements) LO-3 2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam) LO-4, LO-5	Design of prestres	s considerin	o service and trai	sfer conditions	checks	for ult	imate limit	LO-5						
Pre-stress losses [2 h] LO-5 Estimation of prestress losses (short term and long term) LO-5 Practical Work All 1. Tutorial classes All Assignments LO-1, LO-2, LO-3 elements) LO-3 2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam) LO-4, LO-5	state requirements	s (flexural st	rength and shear	resistance)	, checks	<i>j</i> 0 <i>i u</i> 1 <i>i</i>		200						
Estimation of prestress losses (short term and long term) LO-5 Practical Work 1. Tutorial classes All Assignments Image: Comparison of a water retaining structure (A group assignment, where students have to model a tank using a computer software, analyse and then design structural elements) LO-1, LO-2, LO-3 2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam) LO-4, LO-5	Pre-stress losses		105											
Practical Work All 1. Tutorial classes All Assignments Image: Comparison of a water retaining structure (A group assignment, where students have to model a tank using a computer software, analyse and then design structural elements) LO-1, LO-2, LO-3 2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam) LO-4, LO-5	Estimation of pres	stress losses	(short term and la	ong term)				LO-5						
1. Tutorial classes All Assignments I. Design of a water retaining structure (A group assignment, where students have to model a tank using a computer software, analyse and then design structural elements) LO-1, LO-2, LO-3 2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam) LO-4, LO-5	Practical Work						•							
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elements)LO-32. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam)LO-4, LO-5	model a	tank using a	computer softwar	e, analyse and t	hen des	ign stru	ctural	LU-1, LU-2,						
2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam) LO-4, LO-5	elements)	_					LU-5						
	2. Design of a pre-stressed concrete beam (A group assignment, where students have to design a prestressed concrete beam)													

		Categor	y Ty	pe				A	ssessed	LOs	Weig	ghtage
			1.	Report or retaining	n design g structur	of a wat e [15%]	er		LO-1, L	D-3		
Assessme	ents	CA	2.	Report of concrete	n design beam [1	of a pre 5%]	-stressed		LO-4, L	0-5	40	0/2
		CA	3.	Best 2 or (each fro stressed)	ut of 4 in om water [10%]	retainin	izzes g and pro	è-	All		40	70
		WE	Enc	l Semest	er Exam	ination			All		60	%
Recomme Names of	ended T	'extbooks ers	1 2 3 4 5 6 0 Dr.	 Anch (2nd et Desig Forth struct Kong Conc Hurst Press Bhatt Lond K. Bask 	or, R. D. d.). McG ey, B., B gn for Eu , J. P. and ures (3 rd , F. K. a rete (3 rd , H. K. (, P. (201 on: E & aran, Dr	. (1992). Graw-Hill ungey, J ro Code d Martin ed.). Cai nd Evans ed.). Can 1998). Pi 1). Prestr FN Spon H. G. H	Design of Inc. and Hu 2 (7 th ed. A. J. (20 thness: V 6, R. H. (abridge: restresse ressed C Damru	of Liquic lse, R. (2). Red C 14). Des Whittles 1987). R E & FN d Concre oncrete l wan	l Retaini 2012). Re dobe Pre ign of liq Publishin einforce Spon. ete Desig Design to	ng Concr einforced ss. uid retain ng. d and Pro gn (2 nd ed) Eurocoo	rete Struc l Concret ning conc e-stressed .). Londo des (1 st ec	etures e crete d on: CRC d.).
Mapping	of Mod	lule Lear	ning Ou	itcomes	(MLO)	to the Pr	ogramn	ne Outco	omes (P	O)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	Н	М			М							М
LO-2	Н	М	М		L				L			М
LO-3	M	L										М
LO-4	M	М										L
LO-5	Н	М	М		L				L			М
Module	Н	Μ	Μ		L				L			Μ
S	cale:	H – High	1	M – 1	Medium		Ι	L – Low				

Module Code	CE4022 Module Title Hydraulic Design												
Credits	3.0		Lectures	2.5		G720010							
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre – requisit	es CE3012							
Module Type:	Core Modu	ule/Compulsory	Electiv	ve 🗖	Op	tional							
Learning Outcom After completing	mes (LOs) this module,	students should b	e able to:										
LO-1: <i>identify</i> hy	draulic struc	tures and <i>describe</i>	their components acco	ording t	o purpose.								
LO-2: demonstra	te how to de	lineate a watershe	d and <i>develop</i> the desig	n hvdr	ograph of the wa	atershed.							
LO-3: compute th	ne design car	acity yield and st	nillway capacity of a re-	servoir	and	,							
LO-3: compute u	inlet(s) out	et(s) and the energy	but way capacity of a re-	ulic str	ucture consider	ng hydrologic							
hydraulic,	economic an	d environmental f	actors.	une su	ucture, consider	ing nyurorogic,							
Module Outline						LOs Covered							
Introduction to	Hydraulic S	tructures [5 h]											
Different types of	hydraulic st	ructures, their con	nponents and purposes,	and er	nvironmental	LO-1							
considerations re	lated to hydr	aulic structures a	nd their design										
Computation of Catchment deline	dion concer	rograpn [10n]	Unit Hydrograph and	omput	ation of design	LO-2							
hydrograph using	g Synthetic U	Synthetic Unit Hydrograph											
Flood Frequency	y Studies [10) h]											
Application of pro	of probability and statistics in precipitation and flood frequency analysis, LO												
Reservoir capacit	ty and yield,	and spillway capa	city estimation										
Design of Hydra	ulic Structu	res [10 h] and auidalinas day	sion of transitions and	Fnorm	Dissinators	LO-4							
Practical Work	Design Clas	ana guiaennes, aes s)	sign of transitions and I	Litergy	Dissipulers								
1. Developm	ent of Synthe	etic Unit Hydrogra	aph			LO-1. LO-2							
2. Estimation	n of Reservoi	r Capacity and Yi	eld			LO-2, LO-3							
3. Design of	an Energy D	issipater				LO-3, LO-4							
Assignments					-								
1. Field visit	to a reservoi	r/ hydraulic struct	ure identified by individ	dual stu	idents	LO-1							
2. In-class as	signment on	Prequency studies	S/ Yield studies			LO-2, LO-3							
5. III-Class as			T			LO-3, LO-4							
	Category		Type	A	Assessed LOs	weightage							
		Report on indivi	dual field visit [10%]		LO-1								
		studies/ Yield stu	udies [2.5%]		LO-2, LO-3								
Assessments	CA	hydraulic structu	nment 3 on Design of ares [2.5%]		LO-3, LO-4	30%							
		Design Class 1 (Coursework) [5%]		LO-1, LO-2								
		Design Class 2 (Coursework) [5%]		LO-2, LO-3								
-	WE	Design Class 3 (Coursework) [5%]		LU-3, LU-4	700/							
	WE 1 Ch	End Semester Ex	fatt I and Porthuial	- M	All (2004) Hydroy	/0%							
	I. Cha Env	vironmental Engin	eering (4th ed.). CRC I	Press.	(2004). Hyurau	lics in Civil and							
	2. Sub	oramanya, K. (199	4). Engineering Hydrol	logy (2	nd ed.). Tata Mo	cGraw Hill.							
Recommended Textbooks	3. No (4tl	vak, P., Moffat, A n ed.). London: CI	. I. B., Nalluri, C. and N RC Press.	larayan	an R. (2007). H	draulic Structures							
	 United States Department of Interior, Bureau of Reclamation (1978). Design of Small Canal Structures, Revised reprint. Denver, Colarado: United States Government Print Office. 												

Names of Lecturers		Prof	N. T. S.	Wijesek	kera, Dr.	R. L. H.	L. Rajap	oakse				
Mapping	of Moo	lule Lear	ning Ou	itcomes	(MLO) (to the Pr	ogramn	ne Outco	omes (P	O)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М	М	М	L								
LO-2	М	М	М									
LO-3	Н	Н	Н	Н	Н	L	М				М	М
LO-4	Н	М	Н	Н	Н	L	М				М	L
Module	Н	Μ	Н	Н	Н	L	Μ				Μ	Μ
S	cale:	H – Hig	h	M - I	Medium		Ι	L – Low				

Module Code	CE4032	Module Title	e Title Geotechnical Design									
Credits	3.0		Lectures	2.5	_							
GPA/NGPA	GPA	- Hours/Week	Lab/Assignments	3/2	Pre – requisit	es CE3132						
Module Type:	Core Mo	dule/Compulsory	Electi	ve 🗖	Op	tional						
Learning Outo	comes (LOs)											
After completin	ng this modul	e, students should b	e able to:									
LO-1: <i>propose</i> could be	alternative so conducted for	lutions for earth ret or the selection of op	aining structures and for the ptimum solutions with	oundati a greate	ons so that preliner degree of susta	ninary designs iinability,						
LO-2: <i>compreh</i> to propo	<i>lend</i> the impose such measure	rtance of constructi ures for practical ap	on quality control and oplications,	quality	assurance measu	res and ability						
LO-3: <i>apply</i> cla structure	assical earth p es,	ressure theories to	evaluate the lateral ear	th press	ure behind earth	retaining						
LO-4: <i>design</i> g in Sri La	LO-4: <i>design</i> gravity type and embedded type retaining walls in accordance with standard design codes used in Sri Lanka, and											
LO-5: <i>perform</i> under va	idealization o rious loading	of the subsurface co and subsurface cor	nditions and design sha aditions.	allow ar	nd deep foundati	on systems						
Module Outlin	ie					LOs Covered						
Earth Retaining Structures [12 h]Introduction to different options of earth retaining systems, evaluation of earth pressures by Rankine's theory and by Coulomb's trial wedge approach considering the effects of wall roughness, pore water pressure and seepage, introduction to British code for the design of earth retaining structures, design of gravity retaining walls and embedded retaining wallsLO-1, LO-3, LO-4												
Shallow Found Introduction to understanding foundation op idealization of shallow founda of shallow found limitations, mod	Jations [12 h) the concept of the safety of tions, evalua the subsurfa- tions subject dations and e dulus of subg	b s of foundation d ind environmental d tion of material ice conditions, des ed to vertical and in extrapolation techni rade reaction and b	esign and alternative concerns related to con properties from in-si ign of centrally and a aclined loads, introduc ques for prototype four ceams on elastic founda	founda structio tu test eccentru tion of t ndation. utions	tion options, m of different results and ically loaded model testing s and their	LO-1, LO-2, LO-5						
Deep Foundat Introduction to axial carrying of of piles and pile	ions [11 h] construction capacity of sin e groups, neg	quality controlling 1gle pile and pile gr ative skin friction, t	and quality assurance coups subjected to verti esting of piles	of deep ical load	foundations, ls, settlement	LO-2, LO-5						
Assignments						101102						
1. Design of	of an earth ret	aining wall				LO-1, LO-3, LO-4						
2. Design of	of a shallow f	oundation				LO-1, LO-5						
3. Design of	of a deep four	idation		1		LO-1, LO-5						
	Category	,	Гуре	Ass	essed LOs	Weightage						
Assessments	СА	Report on design of wall [10%] Report on design of foundation [10%] Report on design of	of an earth retaining of a shallow of a deep foundation	LO-1	, LO-3, LO-4 D-1, LO-5 D-1, LO-5	30%						
-		[10%]										
	WE	End Semester Exa	mination		All	70%						

			1.	Bowles, J McGraw-	J. E. (199 -Hill.	96). Four	idation a	nalysis a	nd desig	n (5 th ed.). New Y	/ork:
Recomme	ended		2.	Das, B. M PWS.	A. (1998)). Princip	les of G	eotechni	cal Engi	neering (4 th ed.). I	Boston:
1 CAUDOON	5		3.	Poulos, H New Yor	I. G. and k: John V	Davis, E Wiley an	E. H. (19 d Sons.	80). Pile	foundat	ion analy	sis and c	lesign.
			4.	Tomlinso London a	on, M. J. and New	(1994). I York: Ta	Pile designylor & I	gn and co Francis.	onstructi	on practi	ce (4th e	d.).
Names o	f Lectu	rers	Prof. S. A	A. S. Kula	athilaka,	Dr. U. P	. Nawag	amuwa,	Dr. L. I.	N. de Sil	va	
Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L						L			L		L
LO-2	L									L		L
LO-3	М											
LO-4	Н	L	Н							Н		М
LO-5	Η	L	Н	Μ						Н		L
Module	Н	L	Н	Μ			L			Н		Μ
S	cale:	H – Hi	gh M – Medium L – Low									

Module Code	CE4042	2 Module Title Highway Engineering									
Credits	3.0		Lectures	2.5							
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisit	es C	CE3162				
Module Type:	Core Modu	ule/Compulsory	Electiv	ле 🗖	і С	ptional	1				
Learning Outco	mes (LOs)										
After completing	this module,	students should b	e able to:								
LO-1: discuss the	e highway pla	anning process and	the basic principles of	highw	vay design,						
LO-2: design the	geometrical	elements of a high	way in accordance with	h desig	n standards,						
LO-3: <i>apply</i> an a	ppropriate m	ethodology to des	ign the capacity of a hig	ghway,							
LO-4: analyse an	nd <i>design</i> pav	ements (following	an appropriate design	code),	and						
LO-5: <i>demonstra</i> and test m	<i>tte</i> an underst ethods relate	anding of the prop d to highway mate	perties of soil, aggregate rial design.	e and b	itumen, standa	rd specific	cations				
Module Outline						LOs C	Covered				
Highway Planni Functional class	ng [3 h] ification, prin	principle of highway location, factors influencing highway design									
Geometric Desig Sight distance, de elevation, pedest	gn [10 h] esign of align rian and bicy	ment, horizontal and vertical curves, cross sections, super LO-2									
Capacity Design Highway capacity	y, design of t	wo-lane roads, set	rvice flow rate, volume/	capaci	ty ratio, level	LO	D-3				
Pavement Analy <i>Types of paveme</i> <i>loads, Stresses</i> <i>pavement design,</i>	v sis and Mec ents, structur and strains concepts of s	hanistic Design [al components og in pavements, in mechanistic desig	10 h] f flexible pavements, e ttroduction of design n	stimati guidel	on of design ines, asphalt	LC	D-4				
Highway Mater Properties of soil specifications and acceptance criter	ials [6 h] ls, aggregate, d test method ria	and bitumen used s for road constru	l in highway construction materials, quality	on, Sta contro	ndard ol and	LC	D-5				
Practical Work											
1. California	Bearing Rati	io (CBR) and Dyn	amic Cone Penetromete	er (DC	P) Tests	LO	D-5				
Assignments				1.			10.0				
1. Highway the forecas	design projec	t – Carry out a hig ow, prevailing roa	shway design on selected d safety issues and align	ed trace	e considering	LO-1, LO-3.	LO-2, . LO-4				
2. Class Qui	Z		<u> </u>			LO-1, LO	, LO-2, D-3				
	Category		Туре	A	ssessed LOs	Weight	age				
		Report on CBR/	DCP Tests [2%]		LO-5						
Assessments	CA	Report on Highv	vay Design Project [339	%]	LO-1, LO-2, LO-3, LO-4	40)%				
		In-class Quiz [59	%]		LO-1, LO-2, LO-3						
	WE	End Semester Ex	kamination		All	60)%				
Recommended Textbooks		1. Wright, F Wiley &	P. H. and Dixon, K. (200 Sons, Inc.	03). Hi	ghway Engined	ering (7 th e	d.). John				
Names of Lecturers Prof. W. K. Mampearachchci, Dr. H. R. Pasindu											

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L		L			L	М		L		L	
LO-2	L	М	Н		Н				L			
LO-3	L	М	Н						L			
LO-4	L	М	Н		L				L			
LO-5	L		L									
Module	L	Μ	Н		Μ	L	L		Μ		L	
Scale: H – High M – Medium L – Low												

Γ

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Module Code	CE4052	Module Title	Title Environmental Engineering								
Credits	3.0		Lectures		2.5	_					
GPA/NGPA	GPA	Hours/Week	Lab/Assign	ments	3/2	Pre-requisit	es	CE3152			
Module Type:	Core Modu	ıle/Compulsory		Electiv	ve 🗆	()ption	al			
Learning Outcom	nes (LOs)										
After completing	this module,	students should b	e able to:								
LO-1: <i>demonstrat</i> engineering LO-2: <i>select</i> suital	e his/her abi g principles a ble unit oper	lity to plan a wate and <i>determine</i> the rations for treatme	r supply scher operating leve nt of the source	ne for a g els and siz	given co zes of a o achie	ommunity base all components	ed on : , 1 qual	sound			
drinking wa	ater standard	s and <i>provide</i> a co	onceptual desi	gn for a v	vater tr	eatment plant,					
LO-3: assess the r communitie	requirement ses, and	and <i>provide</i> detail	ed designs for	wastewa	ter col	lection systems	s for u	ırban			
LO-4: <i>explain</i> the processes taking place in biological and physicochemical wastewater treatment systems and <i>design</i> a septic tank system according to the Sri Lanka Standards.											
Module Outline							L	Os Covered			
Water Supply [10 h] Achieving SDGs related to water and sanitation, engineering decisions in planning of a water supply scheme, design principles for water supply schemes – Intake, Pumps, Transmission mains, Service reservoirs, Distribution systems											
Water Treatmen Introduction to co Coagulation, Floo	Water Treatment Principles [10 h] Introduction to conventional water treatment processes- Aeration, Plain sedimentation, LO-2 Coagulation Flocculation Sedimentation Filtration Disinfection Stabilization										
Wastewater Coll Sewerage systems Estimation of was	ection [7 h] , Layouts, Se tewater and	ewer appurtenance Stormwater flows	es and design Design of set	concepts,	Sewer	hydraulics,		LO-3			
Wastewater Trea Introduction to bio of a septic tank ac	atment Prin ological trea ecording to S	ciples [8 h] timent and physico ri Lanka Standard	ochemical trea	itment of	wastew	vater, Design		LO-4			
Practical Work											
1. Field samp Dissolved (oling and in-s Oxygen (DO	itu measurement), Turbidity]	of water quali	ty parame	eters [e	.g. pH,	Ι	LO-1, LO-2			
2. Laborator different n methods - 0 Fluoride, C	y experime nethods [Gra Colour, Higl hloride, Nitu	nts on measurer avimetric analysis n-end instruments rate, Phosphate, Su	nent of wate s - Total Sus (Ion Chromat ulphate]	er quality pended S tography)	/ parai Solids,)- Anio	neters using Colorimetric ns such as	Ι	LO-1, LO-2			
3. Determinat coliform le	tion of micro vels in water	biological contan using Multiple T	nination in war ubes Fermenta	ter (Total ation tech	and Fa	necal	Ι	LO-1, LO-2			
4. Jar test for	removal of	Furbidity (Water t	reatment)				Ι	.O-1, LO-2			
5. Break-poin	t Chlorinatio	on for disinfection	(Water treatn	nent)			I	LO-1, LO-2			
Assignments	C (C (1 1	1			т	01102			
1. Suitability	or a water so	burce for water su	pply with simp	pie treatm	toble re	untor.		LO-1, LO-2			
2. Design of a treatment	t plant	ry scheme with the	e incorporatio	n or a suf	table w	ater	I	LO-1, LO-2			
3. Design of a	a septic tank	and its associated	effluent dispo	osal system	m			LO-4			
4. Take-home	e tutorial						Ι	.0-1, LO-3			

	Category	Туре	Assessed LOs	Weightage			
		Assignment 1- [10%] Report on selecting a suitable water source for water supply with simple treatment based on ambient water quality (Practicals 1–3)	LO-1, LO-2				
Assessments	CA	Assignment 2- [20%] Report on design of a water supply scheme and application of concepts of unit processes for water treatment	LO-1, LO-2	40%			
		Assignment 3- [10%] Report based on design of a septic tank and its associated effluent disposal system	LO-4				
		Assignment 4- [0%] Take-home assignments	LO-1, LO-3				
	WE	End Semester Examination	All	60%			
		 Davis, M. L. (2015). Water an principles and Practice (2nd ed.). N 	d Wastewater E New York: McGra	Ingineering: Design aw-Hill Education.			
Recommended		2. Hammer, M. J. and Hammer, M. Technology (5 th ed.). Upper Sadd	J., Jr. (2001). Wa le River: Prentice	ater and Wastewater Hall.			
Textbooks		 Metcalf & Eddy Inc., Tchobano, H. D. (2002). Wastewater Engine New York: McGraw Hill Higher 	glous, G., Burton eering: Treatment Education.	, F. L. and Stensel, and Reuse (4 th ed.).			
		4. WHO (2011). Guidelines for Drinking Water Quality (4 th ed.).					
Names of Lectu	irers	Prof. M. W. Jayaweera, Prof. J. M. A. Manatunge, Dr. (Ms.) W. B. Gunawardana					

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L	L	Н	Н		L	Н			L		
LO-2		М	М	М		М		L				L
LO-3	L	М	Н			М						
LO-4	L	L	М			L	М	L				L
Module	L	Μ	Н	Н		Μ	Н	L		L		L
S	cale:	H – Hig	h	M - N	Medium		L	L – Low				

Module C	Code	CE4112	Mo	dule Title	Ma	Management Skill Development								
Credits		2.0	ILa		Le	ctures		2.0	Due	• • • • • • • •	N			
GPA/NG	PA	GPA	ПО	urs/ week	La	b/Assign	ments	-	- Pre-re	equisites	IN	one		
Module T	ype:	Core Mo	dule/C	ompulsory	~		Elect	ive 🗖		Opt	tional 🗖			
Learning After com	Outcor pleting	nes (LOs) this modul	e, stud	ents should	be ab	le to:								
LO-1: disc	<i>cuss</i> ess	ential pers	onal, in	terpersonal	l and g	group ski	lls necess	ary for	engineer	s,				
LO-2: <i>ider</i> you	<i>ntify</i> the	e skills nec ineers.	essary	to manage t	the hu	man reso	urce that	they wi	ill be inte	eracting a	and deali	ng with as		
Module O	Outline										LOs Co	overed		
Personal s Developin orientation stress, tem	skills [8 g self-a n; Man porary	h] wareness - aging Stre stress redu	- value ess – n uction t	s, cognitive najor elem echniques	e style, ents o	attitude f stress,	towards managir	change, 1g stres	interper s, elimir	rsonal nating	LO-1,	LO-2		
Interpersonal skills [10 h] Supportive communication – definition, principles of supportive communication, principles of supportive listening; Motivating employees – performance, diagnosing work performance problems, enhancing ability, creating a motivating environment; Managing conflicts – interpersonal conflict management, conflict response alternatives, collaborative approach for conflict resolution Crown skills [10 h]														
Group ski Leadership variables; delegate e stages of t	p – cl Delego ffective eam de	hj haracterist ation – ad ly; Teamw velopment	ics, st <u></u> vantage ork – e	yles of le es of delega leveloping	adersi ation, teams	hip, con when an and teat	tingency ad whom mwork, a	appro to dele idvanta	ach ana gate, ho ges of teo	l its w to ams,	LO-1,	LO-2		
		Category			Т	ype		A	ssessed	LOs	Weig	ntage		
			Qui	z on end of	6 th , 7	th, 8th and	9 th week	CS	A 11					
Assessme	nts	CA	Atte	%] endance and cussions [10	d activ)%]	e partici	pation at	class	All		30	%		
		WE	End	Semester 1	Exami	nation			All		70	%		
Recomme Textbook	ended s		1.	Whetten, Skills (5th	D. A.	. and Ca 1.). New	imeroon, Jersey: P	K. S. rentice-	(2003). Hall Inte	Develop ernationa	ing Mar l	agement		
Names of	Lectur	ers	Pro	f. K.A.M.K	. Ran	asinghe,	Dr. L.L. 1	Ekanay	ake					
Mapping	of Mod	lule Learn	ing Ou	itcomes (M	ILO) 1	to the Pr	ogramm	e Outc	omes (P	0)				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
LO-1					<u> </u>			М	Н		М	М		
LO-2		\downarrow						L	L	L	М	М		
Module								Μ	M	L	M	М		
S	cale:	H – High		$M - M\epsilon$	edium		L	- Low						

Module C	ode	CE4123	Mo	dule Title	En	gineering	g Econor	nics				
Credits		2.0		/11/	Le	ectures		2.0	D	•••		T
GPA/NGI	PA	GPA	- Ho	urs/Week	La	ab/Assign	ments	-	- Pre-r	equisites		lone
Module T	ype:	Core Mo	dule/C	ompulsory	V		Elect	tive 🗆]	0p	tional	
Learning	Outcon	nes (LOs)	a stud	onte chould	be ab	la to:						
I O_1: ern	lain fun	damental (oncent	ts of engine	oering	economi	<u>ee</u>					
LO-1: expl LO-2: sele base	<i>ct</i> the b ed on th	est course eir costs, b	of actionent of action	on for an er and return	nginee ns, and	ering prob	olem, by	compa	ring a ran	ge of alt	ernative	actions
LO-3: app	<i>ly</i> risk r	esponse st	rategie	s to manag	e the s	selected a	lternativ	es.				
Module O	utline										LOs C	overed
Fundame	ntals ar	nd discour	ted ca	sh flow [8	h]							
Fundamen flow: time examples,	tals: tir value cash flo	ne value e equivalenc ws and co	quival e of n mpoun	ence of mo toney, sing ding	oney, o le pay	cash flow yment an	[,] diagrai d annuit	ms; Di ty facto	scounted ors, nume	cash rical	LO	D-1
Comparison methods [10 h] <i>Comparison methods: assumptions, net present value, annual worth, equivalent annual</i> <i>cost with/without salvage value, equivalent annual worth of fixed asset lives and perpetual</i> <i>lives, internal rate of return (IRR), minimum acceptable rate of return, benefit cost (B/C)</i> <i>analysis, IRR and B/C irregularities, numerical examples; Analysis of alternatives:</i> <i>classification, mutually exclusive alternatives, incremental analysis, preferred method for</i> <i>decision-making</i>												
Risk resp Economic measures, analysis, r	onse str analys total ec isk iden	tis: marke conomic va tification,	mana price lue, ex risk an	ge selected e and eco tended ber alysis, risk	alter nomic vefit co respo	natives [price, s ost analys nse, risk	10 hj shadow sis, interj control	pricing pretatio	g, perfori on of sens	nance sitivity	LO-1, L(D-2, LO-3
		Category			T	ype			Assessed	LOs	Weig	htage
Assessme	nts	СА	Qui [209	z on end o %]	f 6 th , 8	th , 9 th and	l 10 th we	eks	LO-1, L	.O-2	3()%
		0.11	disc	sussions [1]	0 activ 0%]	e partici	pation at	class	All			,,,,
		WE	End	l Semester	Exami	ination			All		70)%
Recomme Textbooks	ended s		1.	Riggs, . Engineer	l. L., ring E	Bedwo conomi	orth, D. cs (4 th e	D. a. d,). No	and Rar ew York	idhawa, : McGra	S. U. aw-Hill.	(1998).
Names of	Lectur	ers	Pro	f. K.A.M.F	K. Ran	asinghe,	Dr. L.L.	Ekana	yake			
Mapping	of Mod	ule Learn	ing Ot	itcomes (N	ILO)	to the Pr	ogramn	ne Out	comes (P	0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L						L	L			М	L
LO-2	L	L		L			M	M		L	H	L
LO-3	T	L					M	M	+		H	M
wiodule	L	L					IVI	IVI			H	L
So	cale:	H – High		M – M	edium		Ι	L – Lov	V			

Module Code	CE4312	Module Title	Building H	Engineering	5				
Credits	3.0	Here (Week	Lectures		2.0	Dere ere ereisie		CE1112	
GPA/NGPA	GPA	Hours/ week	Lab/Assig	gnments	3/1	- Pre-requisi	les	CEIII2	
Module Type:	Core Mod	ule/Compulsory		Electiv	ve	V (Option	al	
Learning Outco After completing	mes (LOs) g this module,	, students should b	e able to:						
LO-1: recognize	the different	types of services t	hat have to	be included	in a b	ouilding,			
LO-2: analyse an	nd design the	building services	needed for e	ffective fur	nctioni	ng,			
LO-3: implement	t passive and	green concepts for	r houses and	l buildings,					
LO-4: recognize	the way the s	services can be int	egrated with	in a buildir	ng, and	1			
LO-5: <i>design</i> for	mwork and f	acade systems nee	ded for cons	struction of	buildi	ngs.			
Module Outline	•						L	Os Covered	
Introduction to Highlight differed buildings	building ser ent types of	vices [2 h] building services	and the n	eed for pro	oper i	ntegration in		LO-1	
Design of differ Design of buildin various peculiar	ent types of l 1g services ba ities and then	building services used on data perta the integration	[12 h] ining to a po	articular bı	uilding	incorporating	LO-	1, LO-2, LO-4	
Passive concept	s applicable	to buildings [6 h]	o and onora	v officionev			L	.O-2, LO-3	
Design of formy	vork systems	[4 h]	e una energ.	y ejjiciene y				105	
Formwork system	ns and the de	sign aspects						LO-5	
Design of facad Facade systems	es of building and the desig	gs [4 h] n aspects						LO-5	
Assignments	0	I I I I I I I I I I I I I I I I I I I							
1. Indivi	dual Design	Assignment 1 - De	esign of buil	ding servic	es for	a three-storey	LO-	1, LO-2, LO-3	
2. Indivi	dual Design	Assignment 2 - I	Design of bu	uilding serv	vices f	for a 20 to 30-	LO-1	, LO-2, LO-3, LO-4	
	Category		Туре		1	Assessed LOs	١	Veightage	
Assessments	CA	Report on Indivi [15%] Report on Indivi	dual Design	Assignmer	nt 1	LO-1, LO-2, LO-3		40%	
		[10%]		rissigniner	11 2	LO-3, LO-4			
	WE	End Semester Ex	xamination			All		60%	
Textbooks		 Hall, F. an Burlingtor David, V. York: Tay Roger, G. ed) Long 	a Green, R n: Elsevier. C. (2007). lor & Frand (1997). B man	Building cis Group. uilding So	Servi Servi	ng services h ces Engineeri s Technology	andbo ng (5 7 and	th ed.). New Design (1st	
Names of Lectu	turers Prof. M. T. R. Jayasinghe, Dr. (Mrs) J. C. P. H. Gamage, Dr. H. G. H. Damruwar								

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1			М				L					
LO-2	М	L	Н				М			Н		L
LO-3	М		М				Н			М		L
LO-4	М	L	М									
LO-5	L	L	М									
Module	М	L	Μ				Μ			Μ		L
Scale: H – High M – Medium L – Low												

Module Code	CE4322	Module Title	Irrigation Engineering						
Credits	3.0		Lectures	2.5	_				
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisit	es CE3012			
Module Type:	Core Mod	lule/Compulsory	Electiv	ve 🔽	(Optional			
Learning Outco	omes (LOs)	students should b	e able to:						
	<i>1</i> :				. 1				
LO-1: <i>plan</i> and	<i>design</i> an irrig					·····			
rehabilit	rrigation rese	struction, and	d water management sc	neaum	ng to plan alter	natives for reservoir			
LO-3: <i>demonstru</i> and <i>perf</i>	ate an underst	anding of the hydr mic feasibility stu	ro-economic concepts (dy.	e.g. tin	ne value of mo	ney, rate of return)			
Module Outline	2					LOs Covered			
Irrigation Prine	ciples [4 h]								
Soil-plant-water available to the introduction and	relationship, plant, field measuremen	soil moisture stor capacity, permane ts	age, reservoir analogy, ent wilting point, root	evalua zone,	ation of water infiltration –	LO-2			
Evaluation of I	rrigation Rec	uirement [4 h]							
Evapotranspirat	ion, referend	ce crop evapotr	apotranspiration, crop growth stages, crop						
coefficient, crop	evapotranspi	ration, effective ra	infall, efficiency concep	ots in w	ater use, field	L0-2			
irrigation requir	ement								
Common irrigat	ion practices	surface irrigation	wetting nattern hasin	horde	pr and furrow	LO-1			
irrigation, sub-it	rrigation, Ove	erhead irrigation,	Drip irrigation, Lift irr	igation	ana jarrow	LOI			
Planning and D	esign of Irrig	gation Systems [4	h]	0					
Availability of la	ind and water	resources, soil su	rveys, climatologic sur	veys re	elated to crop	LO-1			
<i>water use, site</i>	investigation. ures for plann	s, command area aing and design	, canal layout conside	eration	s and major				
Irrigation Syste	m Managem	ent [6 h]							
Reservoir opera	tion, reservoii	r operation schedu	lles, reservoir operation	n and n	nanagement	LO-2			
options, estimati	on of reservo	ir yield							
Types of irrigati	I Lanka [3 h]	pas of water sour	oos tank irrigation rig	o oultin	ation	101			
environmental c	on systems, ty onsiderations	in the design and	rehabilitation of irriga	tion sv:	stems	L0-1			
Irrigation Wate	er Manageme	ent [4 h]	j						
Objectives of wa	ter managem	ent, methods of dis	stributing irrigation wa	ter, pre	eparation of	LO-1. LO-2			
irrigation sched	ules, advantag s	ges and disadvante	ages of each method, w	ater ma	anagement				
Feasibility Ana	s Ivsis [6 h]								
Financial, econo	omic and envi	ronmental feasibil	ity of irrigation project	s, inter	est	LO-3			
calculations, cas	sh-flow diagra	ums, discount facto	ors and discounting tech	hnique	5				
Assignments									
1. Determin	ation of the Ir	rigation Demand	tems			L0-1			
3. Irrigation	Reservoir Or	beration	tems			LO-1, LO-3 LO-2			
0	Category		Туре	A	ssessed LOs	Weightage			
		Report on Determi Demand [10%]	nation of the Irrigation		LO-1				
Assessments	CA	Report on Planning Irrigation Systems	g and Designing of [10%]		LO-1, LO-3	30%			
		Report on Irrigatio	n reservoir operation [109	6]	LO-2				
	WE	End Semester Ex	xamination		All	70%			

Recommended Textbooks				 Withers, B. and Vipond, S. (1974). Irrigation: Design and Practice. London: Batsford Academic and Educational Limited. Garg, S. K. and Garg, R. (2010). Elementary Irrigation Engineering (3rd ed.). Delhi: Khanna Publishers. Ponrajah, A. J. P. (1988). Technical Guidelines for Irrigation Works. Colombo: Department of Irrigation of Sri Lanka. 									
Names of Lecturers				Prof. N. T. S. Wijesekera, Dr. P. K. C. De Silva									
Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	М	М	Н			L	М			L		L	
LO-2	М	М	М	М	L		М			L		L	
LO-3	М	М	М	L						L	Н	L	
Module	М	Μ	М	L	L	L	Μ			L	L	L	

Scale: H – High

M-Medium

L-Low

Module Code	CE4332	Module Title	Remote Sensing and GIS											
Credits	3.0	1	Lectures											
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es CE214	42							
Module Type:	Core Mo	dule/Compulsory	Elective			Optional								
Learning Outco	omes (LOs)	e students should h	e ableto:											
Arter completing this module, students should be able to:														
LO-1: <i>articulate</i> the fundamentals of Remote Sensing (RS) and Geographic Information Systems (GIS),														
LO-2: interpret a	aeriai photo	graphs and estimate	neights,											
LO-3: analyse re	emote sensir	ig data visually and	digitally,											
LO-4: use GIS fo	or data analy	sis and presentation	n for engineering appli	cations,	and									
LO-5: <i>apply</i> dron	ne technolog	gy in engineering ap	oplications.											
Module Outline		LOs Covered												
Aerial Photogra	ammetry ar	d its applications	[8 h]											
Introduction to a distortions, stere	LO-1, LO-2													
plotting from aer	rial photogr	aphs; Air photo inte	erpretation											
Introduction to	Remote Se	nsing [6 h]												
Spectral reflecte	sfer through	LO-1, LO-2, LO-3												
hands: analysis	s ana energy for different													
purposes: produ	ction of cold	our composites: Inte	rpretation of satellite i	mages	jor aijjereni									
GIS techniques	[10 h]	1	1 J	0										
Introduction to C	GIS, vector d	und raster features,	relationship between f	eatures	and attribute	LO-1, LO-4								
data, introductio	n to develop	ment of feature map	os; Use of GIS software	in data	analysis and									
presentation	D (1													
Introduction to	Drone tech	nology [4 h]		a and a		LO-5								
Practical Work	ne use oj ar	one lechnology in el	ngineering application.	s ana si	irveying									
1. Aerial ph	otograph int	erpretation				LO-2								
2. Image and	alysis using	RS images				LO-2, LO-3								
3. Data anal	ysis using G	IS software				LO-1, LO-	-4							
Assignments														
1. Assignme	ent on Aeria	photogrammetry				LO-1, LO-3	·2,							
2. Assignme	ent on GIS s	oftware				LO-1. LO-	-4							
3. Assignme	LO-1, LO-2	2,												
	Category	,	Гуре	Assessed LOs		Weighta	ige							
		In class practical v software [10%]	vork using GIS	LO	D-1, LO-4									
		Report on Aerial p	hotogrammetry	LC)-1, LO-2,	1								
Assessments	CA	assignment [10%]	6	LO-3		50%	50%							
	CA	Presentation on us [20%]	e of GIS software	LO	D-1, LO-4									
		Report on the use Surveying [10%]	of RS images in	LC	D-1, LO-2, LO-3									
	WE	End Semester Exa	mination	All										
Decommendad		1. Mesev, V. (2	007). Integration of GI	S and R	emote Sensing	. Wiley.	_							
Recommended Textbooks		 Harder, C. (2015). The ArcGIS Book: 10 Big Ideas about Applying Geograp to Your World (1st ed.). California: Esri Press. 												
Names of	Lecture	ers	Mr. 7	T. D. C. I	Pushpaku	ımara								
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Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
LO-1										M				
LO-2	L	L			L					L				
LO-3	L	L			Н	L			L	L				
LO-4	L	L	Н		Н	М	L		М	Н	L	L		
LO-5			L		Н	L	L		М	L		L		
Module	L	L	Μ		Н	Μ	L		Μ	Μ		L		
Scale: H – High M – Medium L – Low														

			constructi	on reenne	105y					
Credits	3.0		Lectures		2.0	D	•••			
GPA/NGPA	GPA	- Hours/Week	Lab/Assig	nments	3/1	Pre-re	quisites	N	one	
Module Type:	Core Mod	ule/Compulsory		Elect	ive 🔽		Opt	ional 🗖		
Learning Outcom	nes (LOs)	students should b	able to:							
I O-1: evaluate fu	ndamentals	of planning civil e	engineering (constructio	on with t	he know	ledge of	current		
technology, constr	uction equ	ipment, new engine	eering produ	cts and me	ethods, a	and	leage of	current		
LO-2: <i>identify</i> range	ge of skills	including ability to	o organize, t	eamwork,	problen	ı solving	and com	nmunica	tion.	
Module Outline								LOs Co	overed	
Construction equipment, ground water pumping and cofferdams [8 h]										
Classification of classificati	LO-1,	LO-2								
Construction of t	unnels, roa	ads, bridges, and	high-rise bu	ildings [1	0 h]			101		
rise building construction LO-1, LO-2										
Formwork, concr	eting, wat	erproofing and cr	ack repair	[6 h]				10.1	10.2	
Mixing, transporti crack repair	ing and pla	cing concrete, Fo	rmwork and	falsework	, Water	proofing	and	LO-1,	LO-2	
Productivity and Health and safety.	safety [4 h] on productivity						LO-1,	LO-2	
Assignments	commun	en producent ny								
1. Class assign	nment on n	nethod statement for	or a given civ	il enginee	ering pro	oblem		LO-1,	LO-2	
2. Field visits	to selected	construction sites			1			LO-1,	LO-2	
С	ategory		Туре		Ass	essed L	Os	Weig	ghtage	
		Report on Assignr Statement [10%]	nent on Met	nod	LC	D-1, LO-	2			
	CA -	Report and presen	tation on fie	d visits	LO	D-1, LO-	2	40	%	
Assessments	WE	End Semester Exa	mination		LC	D-1, LO-	2	60	%	
Recommended		1. Robert Peurit	foy, Clifford	Schexnay	der, Av	iad Shap	ira Robe	rt, Schm	itt (2010).	
Textbooks		(8th ed.)	n pianning, e	quipment	and me	thous , r	vicoraw-	пш са	ucation;	
Names of Lecture	ers	Prof. A. A. D. A.	J. Perera, Di	. L. L. Ek	anayake	, Dr. C.	S.A. Siriv	wardene		
Mapping of Mod	ule Learni	ng Outcomes (MI	LO) to the P	rogramm	e Outco	omes (PO))			
PO1	PO2	PO3 PO4 P	O5 PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1		M	M H	L		М	L	Н	L	
LO-2]	M H	L	M	M	L	H	L	
Module		L	M H	L	L	IVI	L	п	L	
Scale:	H – High	M-Med	lium	L	-Low					

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Module Code	CE4352	Module Title	ule Title Traffic Engineering and Planning							
Credits	3.0		Lectures	2.5	_					
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisite	es CE3162				
Module Type:	Core Mod	ule/Compulsory	Electiv	ve 🔽	0	ptional				
Learning Outco After completing	mes (LOs) this module.	students should b	e able to:							
I O-1: solve prob	lems related	to traffic engineer	ing and planning							
LO-2: <i>choose</i> and condition LO-3: <i>conduct</i> a LO-4: <i>identify</i> ac	l <i>design</i> an aj s, basic Traffic cident risk ai	ppropriate intersec Impact Assessme ad <i>propose</i> suitabl	tion control mechanisn (TIA), and e remedial measures.	n based	l on traffic flow	and geometric				
Module Outline						LOs Covered				
Traffic Flow Models and Flow Analysis [6 h] Basic car following models, different traffic flow models, use of traffic flow models, one- way roads, lane reversal, bus only lanes LO-1										
Traffic Impact Assessments (TIA) [3 h] Methodology of conducting TIAsLO-1, LO-3										
Road safety and Accident data con audits	Accident A	nalysis [3 h] analysis, accident	investigations, conflict	studies	, road safety	LO-1, LO-4				
Transport Plann Advanced trip as	ning: Trip A signment mod	ssignments and T dels and traffic ca	Traffic Calming [5 h] Iming measures			LO-1				
Un-signalized In <i>Types of control a</i> <i>arrangements, ba</i>	itersections and selection usic interchar	and Interchanges criteria, overpass nge types	s [3 h] ses vs. underpasses, difj	ferent r	camp	LO-1, LO-2				
Design of Round Design of rounda	labouts and bouts, capac	Traffic Circles [3 ity, weaving section	bh]			LO-1, LO-2				
Traffic Signals [Signal technolog calculations, ped	6 h] y, warrants fa estrian signa	or traffic signals, j ls	phasing arrangements,	signal	timing	LO-1, LO-2				
Traffic Microsin Traffic microsim	nulation [6 l	1] iques and introduc	ction to simulation softw	vare (V	VISSIM)	LO-1, LO-2				
Practical Work					·					
1. Traffic Su	rvey					LO-1				
2. Introduction	on to VISSIN	A Software				LO-1, LO-2				
Assignments	. T. CC	וידו דיו								
1. Assignme	nt on Traffic	Flow Theory				LO-1				
3 Assignme	nt on Signal	Design				10-110-2				
4. Assignme	nt on Traffic	Simulation using	VISSIM			LO-1, LO-2				
	Category	0	Туре	A	ssessed LOs	Weightage				
		Report on Traffi	c Flow Theory [5%]		LO-1					
		Report on TIA [5%]		LO-3					
Assessments	CA	Signal Design R	eport [15%]		LO-1, LO-2	40%				
		Traffic Simulation output and report	on using VISSIM result t [15%]	S	LO-1, LO-2					
[[WE	End Semester Ex	amination		All	60%				
Recommended Textbooks		1. Kadiyali, R. L. Delhi: Khanna	(2007). Traffic Engine Publishers.	ering a	nd Transport Pl	lanning (7 th ed.).				
Names of Lectur	Names of LecturersProf. J. M. S. J. Bandara, Dr. H. L. K. Perera, Dr. H. R. Pasindu, Dr. G. L. D. I. De Silva									

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	Н	Н	М	М	Н							L	
LO-2	М		Н	L	Н								
LO-3	L	L		М		L							
LO-4	М				М	М							
Module	Н	М	Н	Μ	Н	L						L	
S	cale:	H – Hig	h	M – N	Medium		Ι	L – Low					

Module Code	CE4412	Module Title	Bridge Engineering							
Credits	3.0		Lectures	2.0	-		070440			
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es	CE3112			
Module Type:	Core Mod	ule/Compulsory	Electiv	ve 🗆	()ptior	nal 🔽			
Learning Outco	mes (LOs)	students should b	e able to:							
	·									
LO-1: <i>identify</i> a	suitable bridg	ge considering the	need and resources,	_						
LO-2: idealise, a	<i>nalyse</i> and <i>de</i>	esign bridges mad	e of various materials, a	and						
LO-3: <i>apply</i> theo	ries to assess	the load carrying	capacity of reinforced	concre	te bridge decks					
Module Outline						L	Os Covered			
Classification of	bridges [2 h	ı]					LO-1			
Introduction, cla	ssification of	bridges, Three ma	oments theorem				LO-I			
Bridge loading [4 h]						01100			
Bridge loading, I	Aacaulay's n	iethod (revision),	reciprocal theorem and	Influe	nce lines	I	LO-1, LO-2			
(<i>Tevision</i>)	r hridges [2]	h]								
Investigate the ne	ed, location,	future traffic, cos	t and other engineering	g aspec	ts for bridges		LO-1			
Steel bridges [4 h]										
Steel bridges (inc	luding thin w	valled structures l	ike box girders)				202			
Reinforced conc	rete bridges	and prestressed	concrete bridges [6 h]	huida			102			
hridaes	ele briages, a	inalysis and desigr	i oj presiressea concrete	e briage	es, composite		LO-2			
Analysis of arch	es, design of	masonry arch b	ridges [2 h]							
Elastic and plast	ic analysis of	arches, prelimina	ry aspects involved in r	masonr	y arch bridge	Ι	LO-1, LO-2			
design										
Suspension brid	ges [1 h]	. 1				Ι	LO-1, LO-2			
Introduction to s	heridages [4 h	ages								
Maintenance asp	ects of bridge] es. strength assess	ment of bridge decks u	sing vie	eld line theory		LO-3			
Design of substr	uctures and	foundations [1 h]				100			
Fundamentals of	bridge subst	ructures	-				LO-2			
Construction te	chniques of l	bridges [2 h]					LO-1			
Details of constru	uction techni	ques of bridges								
1 Testing th	o physical m	odel in laboratory					102			
Assignments	e physical m	odel ill laboratory					LO-2			
1. Group ass	ignment (nur	merical modelling,	physical modelling, te	sting a	nd		LO-2			
	Category		Туре	A	ssessed LOs		Weightage			
		Quiz 1 on section	ns covered up to week :	5	LO-1, LO-2					
Assessments	CA	Quiz 2 on mater	ials covered between				40%			
		weeks 5 to 10 [1	0%]		LO-2, LO-3					
		Group assignme	nt [20%]		LO-2					
	WE	End Semester Ex	xamination		All		60%			
		1. BS 540	0: (1988). Steel, concre	ete and	composite brid	lges.				
		2. Euro co	odes relevant to bridge of	design.						
Recommended		3. Leonho	Leonhordt, F. (1984). Bridges: Aesthetics and Design. MIT Press.							
Textbooks		4. Beckett	t, D. (1969). Bridges. Lo	ondon:	The Hamlyn P	ublis	ning Group			
		Limited	1.							
		1								

				5. Sir Edv	Pugley, ward Arn	A. (196 old.	58). The	theory	of Susp	ension H	Bridges	(2 nd ed.).	
				 Victor, D. J. (2017). Essentials of Bridge Engineering (6th ed.). C Publishers. 									
Recomme Textbook	ended s			7. Zha reha Mc	io, J. ai abilitatio Graw-Hi	nd Tonia n, and n ill Educa	as, D. 1 naintena tion.	E. (2017 nce of n	7). Brid nodern h	ge Engin ighway	neering: bridges	Design, (4 th ed.).	
				8. Waddell, J. A. L. (1916). Bridge Engineering. New York: Wiley.									
				9. Ryall, M.J., Nigel Hewson, Parke, G.A.R. and Harding, J.E. (2000									
				The Manual of bridge engineering. Thomas Telford.									
				10. 0'0	Connor, (C. and Sh	naw, P. (2	2000). B	ridge loa	ads: an in	ternatio	nal	
				per	spective	$(1^{st} ed.).$	CRC Pre	ss.					
Names of	Lecture	ers	Dr.	Dr. K. Baskaran									
Mapping	of Mod	ule Lear	ning Ou	tcomes	(MLO) 1	to the Pr	ogramn	ne Outco	omes (PO	D)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	М	L	Н		L							М	
LO-2	Н	М	Н		М							М	
LO-3	М	М	L						М				
Module	Η	Μ	Η		Μ							Μ	

Scale: H	– High M –	Medium	L – Low
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Module Code	CE4432	Module Title	Design of Large Structures							
Credits	3.0	Hours/Wook	Lectures	2.5	Dro roquisitos	CE2112				
GPA/NGPA	GPA	Hours/ week	Lab/Assignments	3/2	Pre-requisites	CE3112				
Module Type:	Core Mod	ule/Compulsory	Electiv	ve 🔽	Opt	ional				
Learning Outco	mes (LOs)	students should b	e able to:							
I O-1: analyse ar	d design larg	re structures such	as huildings large span	bridge	s towers snace t	riisses				
LO-2: perform d	vnamic analy	sis and <i>design</i> for	medium rise buildings	and	s, towers, space (103503,				
LO-3: <i>prepare</i> st disaster re	ructural detai sistant featur	iling for reinforced es.	d concrete, steel and pre	e-stress	ed concrete elem	ents with				
Module Outline						LOs Covered				
Analysis and dealize Structural idealize with pile foundat	sign of tall b ation, use of ions, 3D mod	uildings [7.5 h] Strong elements, of lelling techniques,	coupled shear walls, tra interpretation of result	insfer p ts	lates, dealing	LO-1				
Analysis and dea Structural idealiz interpretation of	Analysis and design of large span brides and culverts [5 h] Image: Structural idealizations, dealing with highway loads, 2D and 3D modelling and interpretation of results LO-1									
Analysis and des Structural idealiz	Analysis and design of towers [2.5 h] LO-1 Structural idealization, interpretation and checking of results LO-1									
Analysis and des Structural idealiz	sign of space ation, 3D me	e trusses [2.5 h] odelling, interprete	ation of results			LO-1				
Earthquake and Modelling of dyn	wind analy amic systems	sis of structures [s, vibration isolation	15 h] on, analysis and design	using o	codes	LO-2				
Structural detai Special detailing	ling [2.5 h] for enhanced	d earthquake resis	tance			LO-3				
Assignments										
1. Analysis a	ind design of	a tall building	1 11 / /			LO-1				
2. Analysis a	e analysis vi	a tower/ bridge/ s	d detailing of a reinford	red con	crete	LO-I				
medium	rise building					LO-2, LO-3				
	Category		Туре	А	ssessed LOs	Weightage				
		Report on Assign [15%]	nment 1 on a tall buildi	ng	LO-1					
Assessments	CA	Report on Assigned tower/ space trus	nment 2 on a bridge/ ss structure [5%]		LO-1	40%				
		Report on Earthore building [20%]	quake analysis of a]	LO-2, LO-3					
	WE	End Semester Ex	kamination		All	60%				
		1. Hosur, V. (20 India (Pvt) Lu	012). Earthquake resistat	int desi	gn of building str	ructures. Wiley				
		2. Smith, B. S. a Design (1 st ed	and Coull, A. (1991). T l., 552 p.). Wiley.	all buil	ding structures: A	Analysis and				
Recommended		3. Hambly, E. C. and Hambly E. A. (1992). Bridge deck behaviour. E & F N Spon.								
TEALDOOKS		4. Standards Au Part 2: Wind	lards Australia (1989). AS 1170.2: Minimum design loads on structure: 2: Wind loads, New South Wales.							
		5. Standards Au Part 4: earthq	ustralia (2007). AS 1170 Juake loads, New South).4: Mi Wales	nimum design los	ads on structures-				
		6. BS EN codes	/ Design guidelines.							
Names of Lecturers Prof. M. T. R. Jayasinghe, Dr. C. S. Lewangamage										

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М	М	Н		Н					М		М
LO-2	Н	Н	Н		Н					М		М
LO-3	М		М			М				М		L
Module	Μ	Μ	Н		М	L				Μ		М
Scale: H – High M – Medium L – Low												

Module Code	CE4442	Module Title	Computational Mecha	anics								
Cuedita	2.0		Lootunog	2.5								
Creatis	5.0	Hours/Week	Lectures	2.5	Pre-requisit	es	CE3112					
GPA/NGPA	GPA		Lab/Assignments	3/2								
Module Type:	Core Mod	ule/Compulsory	Electiv	ve 🔽	(Option	al					
Learning Outco	mes (LOs)		11 /									
After completing	this module,	, students should b	e able to:									
LO-1: <i>discretise</i>	2D, 3D, and	curved structures,										
LO-2: <i>identify</i> su	itable finite e	element(s) for stru	ctural idealization,									
LO-3: model geo	metrical and	material variation	s and inconsistencies,									
LO-4: <i>select</i> suit methods, a	LO-4: <i>select</i> suitable numerical techniques such as finite elements, finite difference and boundary element methods, and											
LO-5: use advanced finite element modelling software to model complex structures.												
Module Outline	1					L	Os Covered					
Introduction to computational mechanics [2 h]												
Introduction to d	ifferent comp	outational techniqi	ies, basics of idealizatio	on and	discretization							
Introduction to d	ormulation [lisplacement_	<mark>д П]</mark> hased shane funct	ions assemblage of glo	hal stit	fness matrix		1.0-2					
and consistent lo	ad vector	buseu snape junei	ions, assemblage of gio	vui siij	Juess mainix		LO-2					
Geometrical mo	delling and	material variation	ns [10 h]									
Geometric ideali	zation, mode	lling material beh	aviour, numerical integ	ration	schemes,		LO-3					
convergence, con	npatibility an	d completeness										
Different numer	difference in	traduction to hour	ons [15 h]	introdu	ction to		104					
fracture mechan	ics and nano-	mechanics	iaary element methoa, t	тгоаи			LO-4					
Application of c	omputationa	al techniques (Pra	actical) [20 h]									
Introduction to a	dvanced finit	e element with Ab	aqus FEA package, the	rmo-m	echanical		105					
modelling, mesh	sensitivity an	d discretization; I	Programme basic finite	elemer	its with		LO-J					
MATLAB												
Assignments	nt on odvono	ad modalling with				1	105					
1. Assignme	nt on advanc	ed modelling with	FEA lement using MATLAF	2		I	0-2 1 0-5					
2. Assignme	Catagoria		T-ma	, ,		1	Wainkton					
	Category			A	Issessed LOS		weightage					
		modelling with I	FEA [10%]		LO-5							
Assessments	CA	Report on Assignation Report on Assignation Report on Assignation (10%)	nment 2 on Formulating]	g	LO-2, LO-5		400/					
115555555555555555555555555555555555555	CA	Quiz 1 on finite [10%]	element formulation		LO-2		40%					
		Quiz 2 on geome material behavio	etrical modelling and our [10%]		LO-3							
	WE	End Semester Ex	xamination		All		60%					
Recommended Textbooks	 Recommended Textbooks 1. Ghali, A., Neville, A. M. and Brown, T. G. (2009). Structural Analysis: Unified Classical and Matrix Approach (6th ed.). Tayler & Francis. [624.04:519.6] 2. Zienkiewicz, O. C. and Taylor, R. L. (1989). The Finite Element Method: Volume 1 (4th ed.). New York: McGraw-Hill. [624.04:Z5] 											
Names of Lectu	Volume I (4 ^w ed.). New York: McGraw-Hill. [624.04:25] Names of Lecturers Prof. I. R. A. Weerasekera, Dr. H. M. Y. C. Mallikarachchi											

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
LO-1	М													
LO-2	Н				М							М		
LO-3	Н				М									
LO-4	Н	М		М	Н									
LO-5	Н	Н		М	Н					L		Н		
Module	Н	Μ		Μ	Н					L		Μ		
Scale: H – High M – Medium L – Low														

Module Code	CE4452	Module Title	Costal and Po	ort Engir	neering				
Credits	3.0		Lectures	C	2.5				
GPA/NGPA	GPA	Hours/Week	Lab/Assignm	nents	3/2	Pre-requisit	es	CE3012	
Module Type:	Core Mod	ule/Compulsory		Electiv	ve 🔽	С)ptior	nal	
Learning Outcom After completing	mes (LOs) this module,	students should b	e able to:						
LO-1: <i>articulate</i> management fram	the importante	ce of coast conserv	vation and prote	ection m	nethods	within an integ	grated	d coastal zone	
LO-2: apply the p	orinciples of	coastal and estuary	y hydraulics in	analysir	ng the in	npacts of coas	tal pr	ocesses,	
LO-3: <i>articulate</i> and <i>apply</i> the theories to assess various coastal processes to identify alternative coast protection methods leading to the preferred option, and LO-4: <i>identify</i> appropriate layouts for small craft harbours and design breakwaters and supporting structures a necessary.									
Module Outline							L	Os Covered	
Coastal environment and Coastal Zone Management in Sri Lanka [5 h] Shoreline of Sri Lanka: Regulatory mechanism and management framework of the coastal zone									
Coastal and Estu Waves and nears	iary hydrau hore hydrody	lics [12.5 h] mamics, estuary h	ydrodynamics					LO-2	
Coastal processe Coastal sediment	s and Coast transport, co	al protection [7.5 pastal cell concept	h] t, coast protecti	on syste	ems		LO-3		
Port and Harbo Harbour planning	ur engineeri g, design of b	ng [10 h] preakwaters and o	ther harbour st	ructures	Ĩ			LO-4	
Assignments									
1. Assignmer	it on integrat	ed coastal zone de	evelopment	action s	vetome		I	LU-1	
3. Assignmen	nt on design	of breakwaters	and coast prot		ystems			LO-4	
	Category		Туре		Α	ssessed LOs		Weightage	
-	0 0	Report on Assign	nment 1 [10%]			LO 1		8 8	
Assessments	CA	Report on Assign	nment 2 [10%]		<u> </u>			30%	
	011	Report on Assign	nment 3 [10%]			LO-2, LO-5		2070	
-	WE	End Semester Ex	amination			All		70%	
Recommended Textbooks		 End Semester Examination All 70% Sorensen, R.M. (1978). Basic Coastal Engineering. New York: Joh Wiley & Sons. Burcharth, H. F. and Hughes S. A. (2002). Coastal Engineerin Manual, Part VI, Fundamentals of Design, Chapter VI-5, Engineer Manual 1110-2-1100, U.S. Army Corps of Engineers. Washington DC: CEM Dean, R. G. and Dalrymple R. A. (1991). Water Wave Mechanics for Engineers and Scientists. Singapore: Advanced Series on Ocea Engineering Vol. 2 World Scientific 							
Names of Lectur	ers	Mr. A. H. R. Ratnasooriya, Dr. T. M. N. Wijayaratna							

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М	М	L	L			L					
LO-2	М	М	М	L					Μ	М		L
LO-3	М	М	Н	L	L				М	М		М
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Module	Μ	Μ	Μ	L					Μ	Μ		L
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Credits 3.0 Hours/Week Lectures 2.0 Pre-requisites CE3132 Module Type: Core Module/Compulsory □ Elective ✓ Optional □ Learning Outcomes (LOS) After completing this module, students should be able to: Optional □ Lo-1: appraise the role of geotechnics in the design of sanitary landfills and the current design methods and technologies. LO-2: predict the likely interactions between waste and soil and estimate the pollutant movement in the ground. LO-3: determine the mechanical aspects and stability of waste containment facilities. LO-4: evaluate strategies for the containment of different types of wastes in sanitary landfills, and LO-3: determine the mechanical aspects and stability of waste containment facilities. LO-4: evaluate strategies for the containment of different types of wastes in sanitary landfills, and LO-3: determine the mechanical aspects of minerology and chemicals on soil LO-1, LO-2 Landfill design (B h] Landfill design (B h] LO-1, LO-2 LO-1, LO-2 LO-3: determine through membranes, effect of punctures, composite liners, mechanisms of mass transport, diffusion, dispersion, advective transport, sorption, predicting transport time, solutions to advection-dispersion equation, infiltration rates LO-2, LO-5 Solutors to advecti	Module Code	CE4472	Module Title	Title Environmental Geotechnics									
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Sri Lankan/ International guidelines for the establishment of waste disposal systems including site selection LO-4 Study of success stories [4 h] LO-1, LO-4 Case studies on waste containment systems under different environment conditions LO-1, LO-4 Practical Work LO-1, LO-2 1. Air permeability test LO-1, LO-2 2. Composition of Municipal Solid Waste (MSW) LO-2 Assignments LO-1, LO-4 1. Presentation on case studies LO-1, LO-2 2. Design of a natural attenuation landfill LO-1, LO-2 3. Design of an engineered landfill LO-1, LO-2, LO-3, LO-5 Assessments Report on Practical work [10%] LO-1, LO-2 Presentation on case studies [10%] LO-1, LO-2, LO-3, LO-5 30%	Establishment	t of waste dis	posal systems [6 h]										
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Study of success stories [4 h]LO-1, LO-4Case studies on waste containment systems under different environment conditionsLO-1, LO-4Practical WorkLO-1, LO-21. Air permeability testLO-1, LO-22. Composition of Municipal Solid Waste (MSW)LO-2Assignments1. Presentation on case studiesLO-1, LO-42. Design of a natural attenuation landfillLO-1, LO-23. Design of an engineered landfillLO-1, LO-2, LO-3, LO-5CategoryTypeAssessed LOsWeightageAssessmentsCategoryTypeAssessed LOsReport on Practical work [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-23. Design of an engineered landfillLO-1, LO-2, LO-3, LO-5CategoryTypeAssessed LOsWeightageAssessmentsCategoryTypeAssessed LOsReport on Practical work [10%]LO-1, LO-2Design of no case studies [10%]LO-1, LO-2CAReport on Design of landfills [10%]LO-1, LO-2Assessed LOsWeightage	including site s	election	_										
Case studies on wase containment systems under apperent environment conditions Practical Work 1. Air permeability test LO-1, LO-2 2. Composition of Municipal Solid Waste (MSW) LO-2 Assignments 1. Presentation on case studies LO-1, LO-4 2. Design of a natural attenuation landfill LO-1, LO-2 3. Design of an engineered landfill LO-1, LO-2, LO-3, LO-5 Assessments Category Type Assessed LOs Weightage Assessments Category Type Assessed LOs Presentation on case studies [10%] LO-1, LO-2 Presentation on case studies [10%] LO-1, LO-2 Assessments CA Report on Practical work [10%] LO-1, LO-2 30%	Study of succe	ess stories [4]	h] immont sustams und	on different empirement	t condi	tions	LO-1, LO-4						
Tractical Work1. Air permeability testLO-1, LO-22. Composition of Municipal Solid Waste (MSW)LO-2Assignments1. Presentation on case studiesLO-1, LO-42. Design of a natural attenuation landfillLO-1, LO-23. Design of an engineered landfillLO-1, LO-2, LO-3, LO-5CategoryTypeAssessed LOsWeightageReport on Practical work [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-230%	Case stuates of	n wasie contai	nmeni systems una	er allferent environmen	u conai	lions							
1. An perintal pe		neghility test					10-110-2						
Assignments I. Presentation on case studies I.O-1, I.O-4 2. Design of a natural attenuation landfill I.O-1, I.O-2 3. Design of an engineered landfill I.O-1, I.O-2, I.O-3, I.O-5 Keeport on Practical work [10%] I. Presentation on case studies I.O-1, I.O-2 3. Design of an engineered landfill I.O-1, I.O-2, I.O-3, I.O-5 Assessments CA Report on Practical work [10%] I.O-1, I.O-2, I.O-3, I.O-5 Assessments CA Report on Design of landfills [10%] I.O-1, I.O-2, I.O-3, I.O-5	2 Compos	sition of Muni	cinal Solid Waste (MSW)			LO-1, LO-2						
Assignments1. Presentation on case studiesLO-1, LO-42. Design of a natural attenuation landfillLO-1, LO-23. Design of an engineered landfillLO-1, LO-2, LO-3, LO-5CategoryTypeAssessed LOsWeightagePresentation on case studies [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-2Assessed LOsWeightageAssessmentsCAReport on Practical work [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-2Assessments	Assignments	sition of multi	eipai bolia waste ((115 (1))			202						
2. Design of a natural attenuation landfillLO-1, LO-23. Design of an engineered landfillLO-1, LO-2, LO-3, LO-5CategoryTypeAssessed LOsWeightageAssessmentsCategoryTypeAssessed LOsWeightagePresentation on case studies [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-2Report on Design of landfills [10%]LO-1, LO-2Assessed LOs	1. Presenta	ation on case s	studies				LO-1. LO-4						
Contraction of an engineered landfillLO-1, LO-2, LO-3, LO-5CategoryTypeAssessed LOsWeightageAssessmentsCAReport on Practical work [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-430%Report on Design of landfills [10%]LO-1, LO-2, LO-3, LO-530%	2. Design of	of a natural at	tenuation landfill				LO-1, LO-2						
Category Type Assessed LOs Weightage Assessments CA Report on Practical work [10%] LO-1, LO-2 Presentation on case studies [10%] LO-1, LO-4 30% Report on Design of landfills [10%] LO-3, LO-5	2 Design	of on oneinee	ad landfill				LO-1, LO-2,						
CategoryTypeAssessed LOsWeightageAssessmentsReport on Practical work [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-4Report on Design of landfills [10%]LO-1, LO-2, LO-3, LO-530%	5. Design (of all engineer			-		LO-3, LO-5						
AssessmentsCAReport on Practical work [10%]LO-1, LO-2Presentation on case studies [10%]LO-1, LO-4Report on Design of landfills [10%]LO-1, LO-2, LO-3, LO-530%		Category Type Assessed LOs Weightage											
Assessments CA Presentation on case studies [10%] LO-1, LO-4 Report on Design of landfills [10%] LO-1, LO-2, LO-3, LO-5 30%			Report on Practica	ll work [10%]	LC	D-1, LO-2							
Report on Design of landfills [10%] LO-1, LO-2, LO-3, LO-5	Assessments	C۵	Presentation on ca	se studies [10%]	LC	D-1, LO-4	30%						
			Report on Design	of landfills [10%]	LC LC	D-1, LO-2, D-3, LO-5	5070						
WE End Semester Examination All 70%	[WE	End Semester Exa	mination		All	70%						

	 Davis, M. L. (2015). Water and Wastewater Engineering: I principles and Practice (2nd ed.). New York: McGraw-Hill Educat Chen, Y., Zhan, L. and Tang, X. (2009). Advances in Environ 	Design tion. mental
Recommended Textbooks	 Geotechnics. Springer. Sharma, H. D. and Reddy, K. R. (2004). Geoenviron Engineering: Site Remediation, Waste Containment, and Err Waste Management Technologies. Wiley. 	mental terging
	 Reddy, K. R. (2013). Evolution of Geoenvironmental engineerin publishing. 	ig. ICE
	 Sarsby, R. W. (2019). Environmental Geotechnics in Pr Introduction and case studies. ICE publishing. 	actice:
Names of Lecturers	Dr. U. P. Nawagamuwa	

I	Mapping	of Modu	ule Lear	ning Ou	tcomes	(MLO) t	to the Pr	ogramn	e Outco	omes (PC))	
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
	LO-1	L	Н				Н	Н			L	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L	Н				Н	Н			L		М
LO-2	Н											
LO-3	Н						Н			L		
LO-4	L	М	М	L		Н				L		Н
LO-5	М		Н			М	Н		L	L		
Module	М	L	Μ	L		Н	Н		L	L		Μ
S	cale:	H – Hig	h	M – N	Medium		L	L-Low				

Module Code	CE4482	Module Title	Computational Geotec	hnical	Engineering							
Credits	3.0		Lectures	2.0	_							
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisites	S CE3132						
Module Type:	Core Modu	ile/Compulsory	Elective	e 🔽	Op	tional						
Learning Outcom After completing	mes (LOs) this module,	students should b	e able to:									
LO-1: <i>apply</i> the f engineerin	s to solve complex											
LO-2: <i>simulate</i> ea	arth slope sta y using comp	bility problems, se uter software,	eepage in soils, earth ret	aınıng	structures and f	oundations in soil						
LO-3: <i>interpret</i> computer generated results in the proper context of geotechnical engineering, and LO-4: <i>interpret</i> high strain load testing and low strain integrity testing of piles.												
Module Outline						LOs Covered						
Finite element formulation [20 h] Los covered Boundary value problems and Indicial notation, the finite element method under small displacement and infinitesimal strain theory, stress and strain analysis in a continuum, constitutive relations for geo-materials LO-1												
Analysis of dyna High strain dynar	mic test rest mic load testi	<pre>ilts of piles [8 h] ing, and low strain</pre>	n integrity testing of pile	found	ations	LO-4						
Practical Work	t to observe a	n application of a	actachnical design			102103						
2. Modelling	of geotechni	cal problems (see	page, earth retaining sys	tems,	slopes and	LO-2, LO-3						
Assignments)										
1. Finite elen	nent (FE) ana	lysis of a propped	excavation			LO-1, LO-2, LO-3						
2. FE analysi	is of a raft fou	indation				LO-1, LO-2, LO-3						
3. FE analysi	is of the stabi	lity of a cut slope				LO-1, LO-2, LO-3						
	Category		Туре	Α	ssessed LOs	Weightage						
		Design report on excavation [20%	FE analysis of propped	Ι	LO-1, LO-2, LO-3							
Assessments	CA	Design report on foundation [15%	FE analysis of a raft]	Ι	LO-1, LO-2, LO-3	50%						
		Design report on stability of a cut	FE analysis of the slope [15%]	Ι	LO-1, LO-2, LO-3							
	WE	End Semester Ex	amination		All	50%						
Recommended 7	ſextbooks	1. V Zienk Elemen Heinem	kiewicz, O. C., Taylor, F t Method: Its Basis and ann.	R. L. aı Funda	nd Zhu, J.Z. (20 mentals (6 th ed.)	05). The Finite . Butterworth-						
		2. Huebne The Fin	r, K. H., Dewhirst, D. L ite Element Method for	., Smit Engin	h, D. E. and By eers (4 th ed.).Wi	rom, T. G. (2001). iley-Interscience.						
Names of Lectur	rers	Dr. L. I. N. I	De Silva									

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	Н				Н							
LO-2	Н		Н		Н	Н				Н		М
LO-3	М		Н		Н	Н	L	L		Н		Н
LO-4	Н				Н	L						М
Module	Н		Н		Н	Н	L	L		Н		Μ
S	cale:	H – Hig	h	M - I	Medium		Ι	L – Low				

Module Code	CE4492	Module Title	Project Managem	ent						
Credits	3.0		Lectures		2.0					
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	s	3/1	Pre-requisites	s CE3142			
Module Type:	Core Modu	le/Compulsory	Ele Ele	ective	e 🔽	Op	otional			
Learning Outcom	mes (LOs) this module,	students should b	e able to:							
LO-1 <i>plan</i> and <i>ex</i>	<i>ecute</i> a proje	ct using project m	anagement tools an	nd tec	hnique	2.				
LO-2 produce pro	piect progress	s reports, and	0		1	,				
LO-3 use of leadi systems.	ng project m	anagement softwa	re MS Project, MS	Proje	ect Sev	ver and Primave	era and ERP			
Module Outline							LOs Covered			
Section 1 Project Project Initiation and project mana	t Manageme – Introducti gement fram	nt Framework [9 ion to project ma ework	h] nagement, Project	man	ageme	nt framework	LO-1			
Section 2 Project Project Manager management, Co Communication of Professional cond	t Manageme nent knowled ost managem nanagement, luct	nt Body of Know dge areas – Inte ent, Quality mai Risk managemer	l edge [10 h] gration manageme nagement, Human nt, Procurement ma	ent, F reso anag	Project ource ement	scope, Time management, and Code of	LO-1, LO-2			
Section 3 IT Too Project Managen and Primavera. N	ls and Mode tent compute lew project m	ern Project Mana rbased tools and panagement techni	gement Methods [techniques – MS P iques such as Agile	[9 h] Projec Proj	ct, MS ject Ma	Project Sever inagement	LO-2, LO-3			
Practical Work	n of construc	tion project using	MS Project and Pr	imav	era		LO-3			
2 Setting up	a project	tion project using			oru		203			
Assignments	a project						LO-1			
1. Assignm	ent on Earne	d Value Method					LO-2			
2. Assignm	ent on Projec	ct Cost Monitoring	5				LO-2			
3. Assignm	ent on Projec	t Risk and Qualit	y Management				LO-2			
4. Assignm	ent on Projec	et Modern ICT me	thods for Project N	/Ianag	gement	t	LO-3			
	Category		Туре		A	ssessed LOs	Weightage			
		Report on Assign	nment 1 [5 %]			LO-2				
		Report on Assign	nment 2 [5 %]			LO-2	2004			
Assessments	CA	Report on Assign	nment 3 [10 %]			LO-2	30%			
		Report on Assign	nment 4 [5 %]			LO-2				
		Coursework on I	Lab Class 1 [3%]			LO-3				
		Coursework on I	Lab Class 2 [2%]			LO-1				
	WE	End Semester Ex	amination			All	50%			
Recommended Textbooks1. Project Management Institute USA, Project Management Body of Knowledge, Version 62. Andrew Stellman, Head First PMP, O'Reilly, New York.										
Names of Lectur	ers	Prof. A. A. I	D. A. J. Perera, Dr.	C. S.	. A. Sii	riwardena				

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
LO-1	L			М	М	М		Η	Н	М	М	М		
LO-2					М	Н		М	Н	Н	М			
LO-3				М	Н				М	Н	М	Н		
Module	L			Μ	Н	М		Μ	H	Н	М	Н		
S	Scale: H – High M – Medium L – Low													

Module Code	CE4522	34522 Module Title Sustainable Design and Construction										
Credits	3.0	TT /TT /	Lectures	2.0	D		OF1122					
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es	CE1132					
Module Type:	Core Mod	ule/Compulsory	Electiv	7e 🔽	0	ptiona	al					
Learning Outco	omes (LOs)											
After completing	g this module,	students should b	e able to:									
LO-1: demonstr	ate skills requ	ired to incorporate	e sustainable design cor	ncepts i	nto engineering	g proje	ects,					
LO-2: select ma	terials for civi	il engineering proj	ects using a life cycle a	pproac	h,							
LO-3: apply sus												
LO-4: perform e	ilding certificat	tion pr	otocols									
Module Outline		LO	s Covered									
Concepts of sus Environmental d	ive actions		LO-1									
Life cycle appr	oach to select	building materia	als [4 h]									
Efficient use of l	ouilding mater	rials in developme	nt projects, energy cons	umptic 	on in material		LO-2					
manufacturing,	transporting a	and during operat	ional cycle of the build	ings, e	mbodied and							
Sustainable cor	struction tec	hniques [4 h]										
Efficient structu	ptimization	L	0-1, LO-2									
techniques			_									
Thermal comfo	rt and Indoo	r air quality [4 h]]				103					
Indoor environn	iental quality	of buildings inclu	ding thermal comfort ar	ıd inde	oor air quality		LO-3					
Natural and ar	tificial ventila	ation designs of b	uildings [2 h]			I	0-1. LO-3					
Building ventila	tion systems a	nd occupant comf	ort levels			_						
Energy efficien	cy and the bl	ant environment	[4 n] huildings_energy_model	llina us	ing standard		I O-3					
software by vary	ving building i	naterials and vent	ilation systems	ung us	ing sianaara		LO-3					
The current tre	ends in renew	able energy sour	ces and applications [2	2 h]			102					
Renewable ener	gy sources us	ed in the built envi	ronment				LO-3					
Sustainable site	e selection, he	eat island effect, u	I tilization of daylight [Including heat island eff	2 h]			LO-1					
Rainwater Har	vesting [2 h]	the building sile i	πεταατής πεαί τετάπα εjj	cci								
Water efficiency	of developme	ent projects giving	emphasis to the rainwa	ter ha	rvesting	L	.O-1, LO-3					
Green building	certification	protocols [2 h]										
Reputed green b	uilding certifi 	cation protocols (e.g. SLGBC, LEED, BR	EAM)	and their		LO-4					
Practical Work	п Lапка											
1. A field vi	isit to green-ra	ated projects				L	D-3, LO-4					
Assignments												
1 A review	on Green cer	tification systems	(I FED /BREEAM/SI (CBC)		L	0-1, LO-2,					
1. A leview				JBC)		L	.0-3, LO-4					
2. Assessme	L	O-1, LO-2, LO-3										
3. Building	energy model	ling using the late	st software				LO-2, LO-3					
	Category		Туре	A	ssessed LOs		Weightage					
Assessments		Report on a Gree LEED / BREEA	en building certified by M/ SLGBC [20%]		LO-1, LO-2 LO-3, LO-4							
	CA	A report on the g a detailed analys incorporated [10	green projects visited wa is of sustainable concer %]	ith ots	LO-1, LO-2 LO-3		40%					

Assignments	СА	A report on embodied e building materials and s based on the green score	nergy of different electing materials e [10%]	LO-2, LO-3				
	WE	End Semester Examinat	ion	All	60 %			
		1. Yudelson, J. (2008). The Green Building Revolution. Washington Island Press.						
		 Kibert, C. J. (2016). Sustainable Construction: Green Building design and delivery (4th ed.). John Wiley. 						
Recommended	Textbooks	 Sarte, S. B. (2010). Sustainable Infrastructure: the guide to green engineering and design (1st ed.). John Wiley. 						
		4. Malina, M. (20 insider's	13). Delivering sust	ainable buildings	: an industry			
			view. Wiley-B	lackwell.				
Names of Lecturers		Prof. (Mrs.) C. Jaya	singhe, Prof. M. T.	R. Jayasinghe, V	isiting Lecturers			
Mapping of Mo	odule Learnir	g Outcomes (MLO) to t	he Programme Ou	tcomes (PO)				

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1		М	М	L		М	Н			М	М	М
LO-2	М	Н	М	L	М		Н			М		
LO-3	Н	Н	М		Н		Н			М		
LO-4		Н	М	L	М	М	Н		М	М		М
Module	Μ	Н	Μ	L	Μ	Μ	Н		Μ	Μ	L	Μ
S	M - N	Medium		Ι	L – Low							

Module Code	CE4532	Module Title Highway Construction and Maintenance Management										
Credits	3.0		Lectures	2.5	-							
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/2	Pre-requisit	es CE3162						
Module Type:	Core Mod	ule/Compulsory	Electiv	ve 🔽	C	ptional						
Learning Outco	omes (LOs)		a abla day									
After completing	g uns module,	students should b										
LO-1: <i>select</i> suit	able material	s for subgrade, sub	base and base construct	ction,								
LO-2: <i>design</i> ho	t mix asphalt	for a given design	specification,									
LO-3: <i>identify</i> su	itable road co	onstruction metho	dology for a given desig	gn and	site conditions	,						
LO-4: demonstra	ate an underst	anding of road ma	intenance management	t, surfa	cing and repair	methods, and						
LO-5: examine a	road constru	ction environment	and review the road co	onstruct	tion methods.							
Module Outline)					LOs Covered						
Pavement struc	ture [2.5 h]	o base and surfac	e laver			LO-1, LO-2						
Pavement mate	rials – Soil a	nd Aggregate [2.4	h]									
Material selection	n for paveme	nt lavers. compac	tion of soil lavers. aual	itv con	trol and	LO-1. LO-3						
assurance tests f	or soil, grave	l and aggregate la	ivers			- ,						
Asphalt Mix De	sign [7.5 h]		•									
Types and uses a	of asphalt mix	es, bitumen specif	ication, bitumen tests, c	aggrega	ate tests,	LO-2						
volumetric desig	n, Marshal m	ix design										
Road construct	ion [12.5 h]			c i								
Asphalt surfacin	g – productio	n, transportation,	laying and compaction	of aspl	ialt concrete,	LO-3						
of construction	ni constructio	on, low cosi consil	fuction methods, tests jo	or quai	liy assurance							
Highway maint	enance [10 h	1										
Pavement distres	sses, periodic	and routine main	tenance of roads - singl	le and r	nultiple							
surface dressing	for periodic i	naintenance, sand	l seals, fog seals, and si	lurry se	eals, pothole	LO-4, LO-5						
repair and sealir	ng cracks, ma	intenance of road	markings and road sig	ns, asp	halt concrete							
overlay, mainten	ance of struc	tures										
Practical Work												
1. Bitumen a	and Aggregat	e Tests relevant fo	r Asphalt Mix Design			LO-1						
2. Marshall	Mix Design	· · · · · · · · · · · · · · · · · · ·	• .			LO-2						
3. Field Visit	to road cons	truction project, D	istress survey			LO-4, LO-5						
Assignments						101102						
1. Preparatio	on of Method	Statement for a R	oad Construction Activ	ity		LO-1, LO-2, LO-3, LO-4						
	Category		Туре	А	ssessed LOs	Weightage						
		Method Stateme Construction Ac	nt for a Road tivity [5%]]	LO-4, LO-5							
Assessments	CA	Report on Aspha	lt Mix Design [20%]		LO-2	40%						
		Report(s) on Roa Distress survey	ad construction method	./	LO-4, LO-5							
	WE	End Semester Ex	amination		All	60%						
Recommended	Textbooks	1. Wright, F Wiley &	P. H. and Dixon, K. (20 Sons, Inc.	03). Hi	ghway Enginee	ering (7 th ed.). John						
Names of Lecturers Prof. W. K. Mampearachchci, Dr. H. R. Pasindu												
Names of Lecturers Prof. W. K. Mampearachchci, Dr. H. R. Pasindu												

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1		L		М								
LO-2	L		М									
LO-3			L	L	Н	L		L	L	L		L
LO-4				L	L	L						
LO-5				М	М	L						
Module	L	L	М	М	Н	L		L	L	L		L
S	Scale: H – High M – Medium L – Low											

I

Module Code	CE4542	542 Module Title Analysis and Design of Transportation Systems									
Credits	3.0		Lectures	25							
	GDA	Hours/Week	Leb/Assignments	2/2	Pre-requisit	es	CE3162				
Modulo Trmos	Com Mad			5/2		Intior					
Module Type:	Core Mod	ule/Compulsory	Electr	ve 💌	(ptior					
Learning Outco	mes (LOs) this module.	students should h	be able to:								
I O 1. i doutifu or	d formulator	nuchlanna valatad t	a transmostation avatam		ing and design						
LO-1: <i>identify</i> af	ia <i>formulate</i>	problems related t	o transportation system	s plann	ing and design	,					
LO-2: <i>identify</i> ap	opropriate too	ols for solving form	nulated problems mathe	ematica	ully,						
LO-3: <i>design</i> a tr	ransportation	system based on u	user requirements, and								
LO-4: analyse a	given transpo	ortation system usi	ng various tools.								
Module Outline						\mathbf{L}	Os Covered				
Introduction to	transportati	on systems [3 h]					101				
Context, concept	s and charac	terization					LO-I				
Highway netwo	rks [3 h]					I	0-2. L0-3.				
Connectivity and	accessibility	, inventory data c	ollection and routine, o	ptimal	paths, link	-	LO-4				
independent/nod	e independen	t alternate paths,	traffic assignment mode	els		T	0.1.1.0.0				
Urban transpor	t systems [3	hj aluaia traffic flou	and and a		***	L	0-1, L0-2, 0.2, L0.4				
Queuing models	ana aelay an	alysis, traffic flow	synchronization and co	ooraina	uion	1	LO-3, LO-4				
Selection of alter	res for transport	feasibility assess	re [5 II] nent_comparison of alt	ornativ	es project	L	.O-1, LO-2,				
evaluations. con	cepts of disas	ter resilience	ieni, comparison of an	crnaiiv	es, projeci	Ι	LO-3, LO-4				
Facility location	problem [3	h]									
E.g. fire and pole	ice stations, e	mergency medical	l services, emergency re	epair se	ervices, etc.,		LO-3				
optimum routing	mechanisms,	transport hubs, r	eliability analysis								
Mass transit sys	stems [6 h]						LO-3				
Optimum networ	k, terminal lo	ocation and route	arrangement, feeder sys	stems							
Mode choice beh	aviour and s	tochastic choice m	ns [9 n] nodelling techniques				LO-2				
Integrated Lane Use of integrated	l use - Trans l land use - tr	port Modelling [ansport modelling	5 h] g techniques for transpo	ort plan	ning	Ι	LO-2, LO-4				
Practical Work		1 0		1	0						
1 Troffic M	a dallin a with	CUDE Voyager	Coffmon			I	.O-1, LO-2,				
	odennig with	COBE VOyager	Software			Ι	LO-3, LO-4				
Assignments											
1. Assignme	ent on Transp	ort networks				I	LO-1, LO-2				
2. Assignme	ent on Feasibi	lity studies				1	LO-3, LO-4				
3. Assignme	ent on Logit e	stimations				L	LO-1, LO-2, LO-4				
	Category		Туре	A	ssessed LOs		Weightage				
		Report on Assig	nment 1 [10%]		LO-1, LO-2						
Assessments	CA	Report on Assig	nment 2 [15%]		LO-3, LO-4		400/				
Assessments	CA		(2 [150/]]	LO-1, LO-2,		40%				
		Report on Assig	nment 3 [15%]		LO-4						
[WE	End Semester E	xamination		All		60%				
		1. Banks,	J. H. (2001). Introducti	ion to T	Transportation	Engin	eering (2 nd				
Recommended	Textbooks	ed.). M	cGraw-Hill.		_						
		2. Haefne	r, L. E. (1986). Introdu	ction to	Transportatio	n Sys	tems. CBS				
		College	e publishing.								
Names of LecturersProf. J. M. S. J. Bandara, Dr. H. L. K. Perera, Dr. H. R. Pasindu, Dr. G. L. D. I. De Silva											

Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1		Н	М	М	Н							L
LO-2	Н				Н							
LO-3		L	М	L		L						
LO-4	Н				Н							
Module	Η	М	Μ	Μ	Н	L						L
S	cale:	H – Hig	h	M – N	Medium		Ι	L – Low				

Credits 3.0 GPA/NCPA Hours/Week Lectures 2.5 Lab/Assignments Pre-requisites CE3152 CE4052 Module Type: Core Module/Compulsory Elective Ø Optional Learning Outcomes (LOS) After completing this module, students should be able to: Image: Core Module/Computing and processes, including mass balances, reactor hydraulics, mass transfer, water chemistry, and wastewater microbiology in conceptual and detailed designs. Image: Core Module/Computing microbiology in conceptual and detailed designs. LO-1: apply the basic scientific principles of common water and wastewater treatment processes. Image: Core Module designs of water and wastewater treatment processes. Image: Core Module designs of water and wastewater treatment processes. LO-2: analyse a given scenario and evaluate the situation, select unit operation and produce creative, cost- effective conceptual designs of water and wastewater treatment options and produce creative, cost- effective conceptual designs of water and wastewater itreatment processes. LO-4: perform detailed calculations of reach unit operation/ process and devise solutions and stipulate technical specifications and cost calculations. Module outline LO-1: LO-2: LO-1: LO-2: LO-1: LO-2: LO-1: LO-2: LO-1: LO-2: LO-3: LO-4 Water treatment design [15 h] Importance design [15 h] Lo-1: LO-2: LO-3: LO-4 LO-1: LO-2: LO-3: LO-4 Preliminary treatment (screening, grit removal, dour control, flow equalization); Primary treatme	Module Code	CE4552	Module Title	Title Water and Wastewater Treatment								
Order Order Hours/Week Inducts Inducts <thinducts< th=""> Inducts <th< td=""><td>Credits</td><td>3.0</td><td></td><td>Lectures</td><td>2.5</td><td></td><td>CE2152</td></th<></thinducts<>	Credits	3.0		Lectures	2.5		CE2152					
Module Type: Ore Module/Compulsory Elective Øptional Learning Outcomes (LOs) After completing this module, students should be able to: LOo-1: apply the basic scientific principles underlying environmental systems used in water and wastewater treatment unit operations and processes, including mass balances, reactor hydraulies, mass transfer, water chemistry, and wastewater microbiology in conceptual and detailed designs. LOo-1: apply the basic scientific principles of common water and wastewater treatment potions and <i>describe</i> underlying mechanisms of basic design principles of common water and wastewater treatment potions and <i>describe</i> underlying mechanisms of basic design principles of common water and wastewater treatment potions and <i>describe</i> creative, cost-effective conceptual designs of water and wastewater treatment options and <i>describe</i> underlying systems, and LO-3: apply these principles to select conventional and advanced treatment options and <i>stipulate</i> technical specifications and cost calculations. KOs Covered Module Outline LOs Covered Vater treatment design [15 h] LOs Covered Mater treatment design [15 h] Importance of good quality water. Water quality guidelines and standards. Selection of water sources and intake structures, Design of conventional and sinflection. plant sizing and layout; Examining the feasibility of site locations, provision for expansion, connection to the water distribution system. Residuals handling system LO-1, LO-2, LO-3, LO-4 Veater treatment design [15 h] Preliminary treatment discreation, distribution system for a selected location for virus reamoval, dasorprion); Nutrient re		GPA	Hours/Week	Lob/Assignments	3/2	Pre-requisite	cE3152 CE4052					
Module Type: Core Module/Compulsory □ Elective Image: Computer Structure S	GIAMGIA	UIA		Lab/Assignments	3/2							
Learning Outcomes (LOS) After completing this module, students should be able to: LO-1: apply the basic scientific principles underlying environmental systems used in water and wastewater treatment unit operations and processes, including mass balances, reactor hydraulics, mass transfer, water chemistry, and wastewater microbiology in conceptual and detailed designs. LO-2: analyse a given scenario and evaluate the situation, select unit operations and produce creative, cost-effective conceptual designs of water and wastewater treatment options and produce creative, cost-effective conceptual designs of water and wastewater treatment options and stipulate technical specifications and cost calculations. Module Outline LO3: apply these principles to select conventional and advanced treatment options and stipulate technical specifications and cost calculations. Module Outline LO3: Covered Water treatment design [15 h] LO3: Covered Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes: scing acration, coagulation, floculation, sedimentation, filtration, disinfection, plant isring and layout: Examining the feasibility of site locaris, provision for expansion, comorcises (latched growth and suspended growth processes, sudge handling, treatment, filtration and chlorination for virus removal, adsorption; Nutrient removal (biological and chemical phosphorous removal, biological antification and amonia stripping): Reduction of dissolved salts (distillation, reverse osmosis, electrodialysis); Use of nanotechnology LO-1, LO-2, LO-3, LO-4, LO-3, LO-4	Module Type:	Core Mod	ule/Compulsory	Electiv	7e 🔽	Ol	ptional 🗖					
LO-1: apply the basic scientific principles underlying environmental systems used in water and wastewater treatment unit operations and processes, including mass balances, reactor hydraulics, mass transfer, water chemistry, and wastewater microbiology in conceptual and detailed designs. LO-2: analyse a given scenario and evaluate the situation, select unit operations and describe underlying mechanisms of basic design principles of common water and wastewater treatment processes, LO-2: analyse a given scenario and evaluate the situation, select unit operations and describe underlying mechanisms of basic design of water and wastewater treatment engineering systems, and LO-4: perform detailed calculations for each unit operation/ process and devise solutions and stipulate technical specifications and cost calculations. LOs Covered Module Outline LOs Covered LOs Covered Mater treatment design [15 h] Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes; screening, aeration, coagulation, floculation, sedimentation, filtration, disinfection, plant stign and layout; Examining the fassibility of site locations, provision for expansion, comection to the water distribution system; Residuals handling system LO-1, LO-2, LO-3, LO-4 Preliminary treatment (screening, grit removal, doour control, flow equalization); Primary treatment (screening, grit removal, doour control, flow equalization); Primary treatment (screening, grit removal, doour control, flow equalization for virus removal, dological processes, shudge handling, treatment fightration, diltration and on-site treatment proceses, shudge handling, treatment fightration, d	Learning Outco After completing	omes (LOs) g this module.	, students should b	e able to:								
LO-2: analyse a given scenario and evaluate the situation, select unit operations and describe underlying mechanisms of basic design principles of common water and wastewater treatment processes, state treatment produce creative, cost-effective conceptual designs of water and wastewater treatment options and produce creative, cost-effective conceptual designs of water and wastewater treatment options and produce creative, cost-effective conceptual designs of a water and wastewater treatment options and produce creative, cost-effective conceptual designs of water and wastewater treatment options and produce creative, cost-effective conceptual designs of a water and wastewater treatment options and stipulate technical specifications and cost calculations. Module Outline LOs Covered Water treatment design [15 h] Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes; sciencening, congulation, flocculation, sedimentation, filtration, disinfection, plant sizing and layout; Examining the feasibility of site locations, provision for expansion, connection to the water distribution system; Residuals handling system LO-1, LO-2, LO-3, LO-4, LO-1, LO-2, LO-3, LO-4, LO-1, LO-2, LO-3, LO-4 Preliminary treatment design [15 h] Suspended growth and suspended growth processes, anaerobic processes, sludge handling, treatment, disposal; Land-based and on-site treatment facilities LO-1, LO-2, LO-3, LO-4, LO-3, LO-4, LO-1, LO-2, LO-3, LO-4, LO-1, LO-2, LO-3, LO-4 Introduction to advanced water and wastewater treatment [5 h] Suspended solids removal (biological and chemical phosphorous removal, biological nitrification, and annmonia stripping); Reduction of dissolved salt	LO-1: <i>apply</i> the treatment chemistry	e basic scient t unit operatio y, and wastew	ific principles un ns and processes, rater microbiology	derlying environmental including mass balance in conceptual and detai	syster s, react iled dea	ns used in wat or hydraulics, n signs,	er and wastewater nass transfer, water					
LO-3: apply these principles to select conventional and advanced treatment options and produce creative, cost-effective conceptual designs of water and wastewater treatment engineering systems, and LO-4: perform detailed calculations for each unit operation/ process and devise solutions and stipulate technical specifications and cost calculations. Module Outline LOs Covered Water treatment design [15 h] Innortance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes: screening, aeration, coagulation, flocaulation, selimentation, flitration, disinfection, plant sizing and layout; Examining the feasibility of site locations, provision for expansion, connection to the water distribution system; Residuals handling system LO-1, LO-2, LO-3, LO-4 Wastewater treatment design [15 h] Preliminary treatment (screening, grit removal, odour control, flow equalization); Primary treatment; Biological processes (attached growth and suspended growth processes, anaerobic processes, sludge handling, treatment [5 h] LO-1, LO-2, LO-3, LO-4 Suspended solids removal (granular media filtration, filtration and chlorination for virus removal, absorption); Nutrient removal (biological and chemical phosphorous removal, biological nitrification and ammonia stripping); Reduction of dissolved salts (distillation, reverse osmosis, electrodialysis); Use of nanotechnology LO-1, LO-2, LO-3, LO-4 Assignments Category Type Assessed LOs Weightage Assignments CA Assignment 1- [20%] Report on design of a water tre	LO-2: <i>analyse</i> mechanis	a given scen sms of basic d	ario and <i>evaluate</i> esign principles of	the situation, <i>select</i> uf common water and wa	anit op astewat	erations and <i>de</i> er treatment pro	escribe underlying ocesses,					
LO-4: perform detailed calculations for each unit operation/ process and devise solutions and stipulate technical specifications and cost calculations. LOs Covered Module Outline LOs Covered Water treatment design [15 h] Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes; screening, aceration, coagulation, floculation, selimentation, filtration, disinfection, plant sizing and layout; Examining the feasibility of site locations, provision for expansion, connection to the water distribution system; Residuals handling system LO-1, LO-2, LO-3, LO-4 Wastewater treatment design [15 h] Preliminary treatment (screening, grit removal, odour control, flow equalization); Primary treatment; Biological processes (attached growth and suspended growth processes, anaerobic processes, sludge handling, treatment, disposal; Land-based and on-site treatment facilities LO-1, LO-2, LO-3, LO-4 Introduction to advanced water and wastewater treatment [5 h] Suspended solids removal (gramular media filtration, filtration and chlorination for virus removal, adsorption); Nutrient removal (biological and chenical phosphorous removal, biological nitrification, denitrification and ammonia stripping); Reduction of dissolved salts (distillation, reverse osmosis, electrodialysis); Use of nanotechnology LO-1, LO-2, LO-3, LO-4 Assignments LO-1, LO-2, LO-3, LO-4 LO-1, LO-2, LO-3, LO-4 LO-1, LO-2, LO-3, LO-4 4. Assignment 1- [20%] Report on design of a waster treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4	LO-3: <i>apply</i> the effective	se principles conceptual de	to select convention esigns of water and	onal and advanced treat d wastewater treatment	ment o engine	ptions and <i>proc</i> ering systems, a	<i>duce</i> creative, cost- and					
Module Outline LOs Covered Water treatment design [15 h] Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes: screening, aeration, coagulation, flocculation, sedimentation, filtration, disinfection, plant sizing and layout; Examining the feasibility of sile locations, provision for expansion, connection to the water distribution system; Residuals handling system LO-1, LO-2, LO-3, LO-4 Wastewater treatment design [15 h] Preliminary treatment (screening, grit removal, odour control, flow equalization); Primary treatment; Biological processes (attached growth and suspended growth processes, anaerobic processes, sludge handling, treatment, disposal; Land-based and on-site treatment facilities LO-1, LO-2, LO-3, LO-4 Introduction to advanced water and wastewater treatment [5 h] Suspended solids removal (granular media filtration, filtration and chlorination for virus removal, adsorption); Nutrient removal (biological and chemical phosphorous removal, biological nitrification, denitrification and ammonia stripping); Reduction of dissolved salts (distillation, reverse osmosis, electrodialysis); Use of nanotechnology LO-1, LO-2, LO-3, LO-4 Assignments Category Type Assessed LOS Weightage Assignment 1- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 40% Assignment 2- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 40% WE End Semester Exami	LO-4: <i>perform</i> of specifica	detailed calcul tions and cost	ations for each un calculations.	it operation/ process an	d <i>devis</i>	se solutions and	stipulate technical					
Water treatment design [15 h] Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes: screening, aeration, coagulation, flocculation, sedimentation, filtration, disinfection, plant sizing and layout; Examining the feasibility of site locations, provision for expansion, connection to the water distribution system; Residuals handling system LO-1, LO-2, LO-3, LO-4 Wastewater treatment design [15 h] Preliminary treatment (screening, grit removal, odour control, flow equalization); Primary treatment; Biological processes (attached growth and suspended growth processes, anaerobic processes, sludge handling, treatment, disposal; Land-based and on-site LO-1, LO-2, LO-3, LO-4 Introduction to advanced water and wastewater treatment [5 h] Suspended solids removal (granular media filtration, filtration and chlorination for virus removal, adsorption); Nutrient removal (biological and chemical phosphorous removal, biological nitrification, denitrification and ammonia stripping); Reduction of dissolved salts (distillation, reverse osmosis, electrodialysis); Use of nanotechnology LO-1, LO-2, LO-3, LO-4 1. Design of a water treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 LO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project Assignment 1- [20%] Report on design of a water treatment system for a selected location/project	Module Outline	e					LOs Covered					
Wastewater treatment design [15 h] Image: Constraint of the system for a selected location / project LO-1, LO-2, LO-3, LO-4 Preliminary treatment (screening, grit removal, odour control, flow equalization); Primary treatment; Biological processes (attached growth and suspended growth processes, anaerobic processes, sludge handling, treatment, disposal; Land-based and on-site treatment facilities LO-1, LO-2, LO-3, LO-4 Introduction to advanced water and wastewater treatment [5 h] Suspended solids removal (granular media filtration, filtration and chlorination for virus removal, adsorption); Nutrient removal (biological and chemical phosphorous removal, biological nitrification and ammonia stripping); Reduction of dissolved salts (distillation, reverse osmosis, electrodialysis); Use of nanotechnology LO-2, LO-3 Assignments Image: Constraint of the system for a selected location / project LO-1, LO-2, LO-3, LO-4 2. Design of a water treatment system for a selected location / project LO-1, LO-2, LO-3, LO-4 LO-1, LO-2, LO-3, LO-4 Assessments Category Type Assessed LOS Weightage Assignment 1- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 40% Assignment 2- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 40% WE End Semester Examination All 60% 60% 60% <td colspan="11">Water treatment design [15 h] Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes: screening, aeration, coagulation, flocculation, sedimentation, filtration, disinfection, plant sizing and layout; Examining the feasibility of site locations, provision for expansion, connection to the water distribution system: Residuals handling system</td>	Water treatment design [15 h] Importance of good quality water, Water quality guidelines and standards, Selection of water sources and intake structures, Design of conventional treatment processes: screening, aeration, coagulation, flocculation, sedimentation, filtration, disinfection, plant sizing and layout; Examining the feasibility of site locations, provision for expansion, connection to the water distribution system: Residuals handling system											
Introduction to advanced water and wastewater treatment [5 h] Suspended solids removal (granular media filtration, filtration and chlorination for virus removal, adsorption); Nutrient removal (biological and chemical phosphorous removal, biological nitrification and ammonia stripping); Reduction of dissolved salts (distillation, reverse osmosis, electrodialysis); Use of nanotechnology LO-2, LO-3 Assignments I. Design of a water treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 4 Category Type Assessed LOs Weightage Assignment 1- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 4 CA Assignment 1- [20%] 40% Report on design of a water treatment system for a selected location/project Mo% 40% WE End Semester Examination All 60%	Wastewater tree Preliminary tree treatment; Biolo anaerobic proce treatment facilit	atment desig utment (screer ogical process osses, sludge h ies	n [15 h] hing, grit removal, es (attached grown handling, treatmen	odour control, flow equ th and suspended growt t, disposal; Land-based	ualizati th proc l and oi	ion); Primary esses, n-site	LO-1, LO-2, LO-3, LO-4					
Assignments 1. Design of a water treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 Assessments Category Type Assessed LOs Weightage Assignment 1- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 40% Assignment 2- [20%] Report on design of a wastewater treatment system for a selected location/ LO-1, LO-2, LO-3, LO-4 40% WE End Semester Examination All 60%	Introduction to Suspended solid removal, adsorp biological nitrifi (distillation, rev	advanced was s removal (gr tion); Nutrien cation, denitr erse osmosis,	ater and wastewa anular media filtra at removal (biologi fication and amma electrodialysis); U	ter treatment [5 h] ation, filtration and chlo ical and chemical phosponia stripping); Reduction Use of nanotechnology	orinatio ohorou on of di	on for virus s removal, issolved salts	LO-2, LO-3					
1. Design of a water treatment system for a selected location/ project 1. DO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 2. Design of a wastewater treatment system for a selected location/ project Assessed LOs Weightage Assessments Category Type Assessed LOs Weightage Assessments CA Assignment 1- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 40% Verify the project WE End Semester Examination All 60%	Assignments						10-110-2					
2. Design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 Assessments Category Type Assessed LOs Weightage Assessments Assignment 1- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 40% Assignment 2- [20%] Report on design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 40% WE End Semester Examination All 60%	1. Design of	f a water treat	ment system for a	selected location/ proje	ct		LO-3, LO-4					
AssessmentsCategoryTypeAssessed LOsWeightageAssignment 1- [20%] Report on design of a water treatment system for a selected location/projectLO-1, LO-2, LO-3, LO-440%Assignment 2- [20%] Report on design of a wastewater treatment system for a selected location/ projectLO-1, LO-2, LO-3, LO-440%WEEnd Semester ExaminationAll60%	2. Design of	f a wastewate	r treatment system	for a selected location/	projec	t	LO-1, LO-2, LO-3, LO-4					
Assignments Assignment 1- [20%] Report on design of a water treatment system for a selected location/project LO-1, LO-2, LO-3, LO-4 Assignment 2- [20%] Report on design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 WE End Semester Examination All		Category	Туре		А	ssessed LOs	Weightage					
Assessments CA Assignment 2- [20%] 40% Report on design of a wastewater treatment system for a selected location/ project LO-1, LO-2, LO-3, LO-4 40% WE End Semester Examination All 60%	Assessments		Assignment 1- [Report on design system for a sele	20%] n of a water treatment ccted location/project		LO-1, LO-2, LO-3, LO-4	40%					
WE End Semester Examination All 60%	ASSESSMENTS	CA	Assignment 2- [2 Report on design treatment system project	20%] 1 of a wastewater 1 for a selected location	/	LO-1, LO-2, LO-3, LO-4	40%					
		WE	End Semester Ex	xamination		All	60%					

			1.	Davis, M and Prac	M. L. (20 ctice (2 nd	015). Wa ed.). Ne	ter and V w York:	Wastewa McGraw	ter Engi 7-Hill Ec	neering:	Design p	orinciples	
Recomme Books	ended T	exts	2.	Metcalf (2002). McGrav	& Eddy Wastewa v Hill Hi	Inc., To ater Engi gher Edu	chobanog neering: ication.	glous, G. Treatme	, Burton ent and I	, F. L. a Reuse (4 ^t	nd Stens ^h ed.). No	el, H. D. ew York:	
			3.	Ambien Quality:	t water o WHO; S	uality st SLS; EP.	andards, A standa	Guidelin rds.	nes/ Star	ndards fo	r Drinki	ng Water	
			4.	Wastew	ater disc	harge sta	indards (CEA).					
Names of	Lectur	ers	Prof. M.	W. Jayav	veera, Pr	of. J. M.	A. Mana	atunge, I	Dr. (Ms.)	W. B. G	unaward	lana	
Mapping	Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	Н	Μ	М		L	L		М	L	М		L	
LO-2	Н		М	М	М	М	М		L				
LO-3	Н	Μ	М		L	L	L				L		
LO-4	Н	Н	Н		М	L	М	М	L	М		L	
Module	Н	Μ	Н	H M M L M M L L L									
S	cale:	H – H	igh M – Medium L – Low										

Module Code	CE4562	Module Title	itle Environmental Impact Assessment									
Credits	3.0		Lectures	2.0								
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/1	Pre-requisit	es	CE3152					
Module Type:	Core Mod	ule/Compulsory	Electi	ve 🔽	0	ption	al					
Learning Outco	omes (LOs) this module.	students should h	e able to:									
LO-1: <i>participat</i> Sri Lanka environm	te in discussio s commitment,	ons on and express nt to sustainable d	opinions about global evelopment, internatio	enviror nal trea	nmental issues, ties and conver	globa ntions	al trends and on					
LO-2: <i>explain</i> th process,	e purpose and	l role of Environm	nental Impact Assessme	ent (EIA	A) in the decision	on-ma	aking					
LO-3: serve as a	member of a	team of consultan	ts who undertake an E	nvironn	nental Impact A	Assess	sment study,					
LO-4: <i>prepare</i> the Project A	he Terms of R pproving Age	Reference and to even over a concerned and the second seco	valuate an EIA report s	ubmitte	ed by a client as	s an o	fficer in a					
LO-5: <i>quantify</i> t in engine	he impacts an ering projects.	d <i>recommend</i> mea	asures to avoid or mini	mise so	cial and enviro	nmen	tal concerns					
Module Outline	e		LOs Covered									
Development an Environmental i	nd the enviro ssues related	nment [8 h] to development pr	projects, global environmental issues LO-1, L									
The EIA proces EIA regulations assessment (SEA measures into p organizations	Environmental issues Environmental issues The EIA process [10 h] EIA regulations, the EIA process in Sri Lanka, project EIA and strategic environmental assessment (SEA) – EIA as a planning and management tool, incorporation of remedial measures into project documentation, EIA process adopted by multilateral/ bilateral LO-2, LO-3											
Conducting an Terms of Refer quantification, mitigation	EIA [8 h] rence (TOR) EIA techniqu	preparation, bas es and methodol	seline studies, impact ogies, evaluation of	t identi alterna	ification and tives, impact	L	.O-3, LO-4, LO-5					
Introduction to Concept of value environmental c	environmen ution of enviro	tal cost – benefit conmental costs, dis	analysis [4 h] scounting rates, interna	alization	n of	L	.O-1, LO-2, LO-4					
Environmental Preparation of E Plan (EMoP) for	Managemen Environmental r development	t and Environme Management Pla projects	ntal Monitoring Plan m (EMP) and Environn	s [4 h] nental 1	Monitoring	I	.O-3, LO-5					
Assignments												
1. Case Si Assessme details pro Project A	tudy – Initia ent of a prop povided by the pproving Age	al Environmental osed developmen proponent and Ter ncy	Examination or En t project in Sri Lank ms of Reference provid	vironm a, using led by t	ental Impact g the project he relevant	L L	.0-2, LO-3, .0-4, LO-5					
2. Field Vis residents	it – Reconnais and officials o	ssance visit to the of the project prop	Project Site, interviews onent.	s with l	ocal	L	.O-3, LO-5					
	Category		Туре	А	ssessed LOs	We	eightage (%)					
Assessments	CA	Assignment 1- [4 Report based on given case study steps involved ir exercise for scop Impact Matrix P. Assessment, Qua mitigation of Im EMP and EMOP	40%] an EIA carried out for , including the importa an EIA (role-play bing, TOR preparation, reparation and antification and pacts, preparation of)	a int I	LO-1, LO-2, LO-3, LO-4, LO-5		40%					
	WE	End Semester Ex	xamination		All		60%					

Recomme Textbook	ended s			1. Ca M Er 2. Pr	anter, L. cGraw- l ngineerin inciples	W. (1995 Hill Serie g. of Envire	5). Envir es in Wat	onmenta ter Resou Impact	l Impact irces & l Assessm	Assessm Environn ent (199	nent (2 nd nental 8). USEI	ed.). PA.	
				3. Ot	fficial we	ebsite of	the Cent	ral Envir	onmenta	l Author	ity of Sr	i Lanka -	
Names of Mapping	Lecture	ers ule Lear	Pro Dr. ning Ou	Prof. M. W. Jayaweera, Prof. J. M. A. Manatunge, Dr. (Ms.) W. B. Gunawardana Outcomes (MLO) to the Programme Outcomes (PO)									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1		L				М	Н	Н	М	Н	L	М	
LO-2						М	Н	Н	L	Н	L	М	
LO-3		L				Н	М	Н	Н	Н	L	М	
LO-4		L				Н	Н	Н		Н			
LO-5						Н			М	Н	М	М	
Module		L		H H H M H L M									
S	Scale: H – High M – Medium L – Low												

Module Code	CE4902	Module Title	Communication Skill	s for P	rojects								
Credits	2.0	Hours/Week	Lectures	1.0	Pre – requisite	FI 1012							
GPA/NGPA	NGPA	Hours/ Week	Lab/Assignments	3/1	Tre – requisite	5 EE1012							
Module Type:	Core Module	e/Compulsory	✓ Elective		Optio	nal							
Learning Outcom	nes (LOs)												
After completing	this module,	students should t	be able to:										
LO-1: demonstrat	te skills to w	rite professional p	project proposals, report	ts and l	iterature reviews,								
LO-2: <i>write</i> research reports, minutes of meetings, memos, emails and letters, and													
LO-3: <i>conduct</i> oral presentations and meetings.													
Module Outline						LOs Covered							
Project Proposal		I O-1											
Writing project pr		LO-1											
Literature Revie Familiarize with s related to the su databases such as techniques, use of	w [2 h] standard men bject, use o Scopus/Scie Freference m	thods of searching of online method enceDirect, perfor anagement system	g reputed literature usin s for the literature se ming literature review ns and plagiarism tools	ng vario arch u using s	ous keywords sing reputed tandard	LO-1, LO-2							
Project Reports Writing reports fo following standar	[2 h] or various ty _] d formats for	pes of technical pr r different types o	rojects: preparation of [f projects, writing styles	project s, etc.	reports	LO-1, LO-2							
Research Papers Writing research	[2 h] papers targe	eting various repu	ted journals and confer	rences		LO-1, LO-2							
Minutes, Memos	, Emails and	d Letters [2 h]				LO-2							
Writing minutes of	f meetings, n	nemos, letters, an	d other relevant office o	commu	nications	202							
Presentation Tec	niques [2]	n] kills for effective	oral presentation			LO-3							
Participation at a	meetings. To	elephone convers	ations [2 h]										
Effective techniqu maintaining comm	es to conduc nunication el	ct and participate thics	in meetings, effective te	lephon	e skills and	LO-3							
Practical Work													
1. Writing Pro	oject/ Resear	rch proposals				LO-1							
2. Databases,	Literature si	urvey, Referencin	g and Plagiarism			LO-1, LO-2							
3. Project rep	orts					LO-1, LO-2							
4. Writing res	search paper	S 1 1				LO-1, LO-2							
5. Business le	etter writing	and e-mails	versations			L0-2							
7 Propering 1		LO-3											
Assignments	I	LO-3											
1 Writing Ru	isiness letter	s			I	L O-1							
2. Writing a F	Project propert	osal				LO-1. LO-2							
3. A detailed	Literature re	view				LO-1, LO-2							
4. Writing a I	Project repor	t				LO-1, LO-2							
5. Project pre	sentation					LO-3							
					1								

		Categor	y		T	ype		A	ssessed	LOs	Weig	ghtage
			Bus	iness lett	er writin	g [10%]			LO-1			
			Proj	ect/ rese	arch proj	posal [10)%]		LO-1, L0	D-2	Weightage 100% 100% at the Computer 10 PO11 PO12 10 PO11 10 M 1 M 1 M 1 M	
			Rep	ort on lit	erature r	eview [2	0%]		LO-1, L0	D-2		
Assessme	ents	CA	A de	etailed p	roject rep	ort [20%	6]		LO-1, L0	D-2	100	1%
			Ora	l present	ation [20	%]			LO-3			
			Wri	ting a pr	oject arti	cle [10%]		LO-2	,		
			Tak	e home a	issignme	nt [10%]			LO-2, LO)-3		
		WE	End	Semeste	er Exami	nation			N/A		0%	6
Recomme	ended		1.	Colle	ction of e	e-learnin	g materia	al availa	ble on M	oodle at	the Com	puter
Textbook	S			Resou	irces Uni	ts of the	Departn	ient.				
Names of	Lectu	rers	Pr Di	of. (Mrs. r. (Mrs.)	.) C. Jaya M. T. P.	asinghe, Hettiara	Dr. (Mrs chchi	.) A. S.	Ranathur	ıga,		
Mapping	of Mo	dule Lear	ning Ou	tcomes	(MLO) (to the Pr	ogramn	ne Outc	omes (PO	D)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1								L		Н		М
LO-2								М	L	Н		М
LO-3								L	М	Н		М
Module								L	Μ	H		Μ
S	cale:	H – Higl	1	M - I	Medium		Ι	L – Low				

Module Code	CE4912	Module Title	e Title Comprehensive Design Project										
Credits	5.0	/	Lectures	-	-								
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	-	Pre-requisites	None							
Module Type:	Core Modu	ule/Compulsory	Electi	ve 🗖	Optio	onal							
Learning Outcom	nes (LOs) this module,	students should b	e able to:										
LO-1: <i>propose</i> de alternatives	sign alternat	ives and master pl	an for a given project	brief an	d <i>analyse</i> feasibili	ty of those							
LO-2: <i>apply</i> stand Financial/E	lard methods Economic and	s to carry out Envi d Technical feasib	ronmental and social a bility,	ppraisa	l, Traffic Impact A	ssessments,							
LO-3: conduct pre	eliminary an	alyses using site in	nvestigation data,										
LO-4: perform de	tailed analys	is and designs for	the selected solution u	sing sit	e related data,								
LO-5: <i>estimate</i> the	e project cos	t by preparing the	bills of quantities and	necessa	arv tender docume	nts. and							
LO-6: <i>demonstrate</i> necessary skills to undertake design projects, work in a team and complete the design													
LO-6: <i>demonstrate</i> necessary skills to undertake design projects, work in a team and complete the design phase and deliver the outcome in the form of reports and drawings to the satisfaction of all stakehol													
Module Outline		LOs Covered											
Terms of Referen	nce [2 weeks	s]											
Identification of o	bjectives, re	quirements and no	ature of the project; Pr	oject or	ganization	LO-1, LO-6							
and feam building		~1											
Formulation of co	vsis [4 weeks	sj sign alternatives o	and analysis of feasibili	ity of th	050	LO-1, LO-2,							
alternatives consi	dering envir	onmental, social,	economic and financia	l aspeci	ts	LO-6							
Development of	oreliminary	designs [2 weeks	s]		~	100100							
Development of p	reliminary d	esign for the selec	ted alternative using s	ite inve	stigation data	LO-2, LO-3,							
and also with suff	icient attenti	ion to principles o	f sustainability			LO-0							
Performing detai	iled designs	[8 weeks]				LO-2, LO-4,							
Detailed designs i	ncluding sup	per structure, sub	structure, building ser	vices, ei	tc.	LO-6							
Cost Studies and	Financial p	proposals [3 week	s]		. (
Preparation of ter	ider docume Ethe project	nts and other wor	k associated with proc	uremen	t/	LO-5, LO-6							
Preparation of w	ritten comn	nunication of the	project outputs [3 wa	eksl									
Detailed drawings	s and reports	s	project outputs [5 w	CK 5]		All							
Assignments	1												
1. Conceptual	l design with	alternatives for the	he major development	envisag	ed	LO-1							
2. Feasibility alternatives	study to ind	icate the environm	nental, social and finan	cial via	bility of	LO-1, LO-2							
3. Developme layouts)	ent of prelim	inary designs for	the selected alternative	(both c	concepts and	LO-2, LO-3							
4. Detailed ar	nalyses of the	e super-structure u	using site specific data			LO-4							
5. Detailed de	esign of the s	super structure and	d building services (if a	applicab	ole)	LO-4							
6. Detailed lo	ad evaluatio	n and structural ar	nalysis of sub-structure	•		LO-4							
7. Detailed de	esign of sub-	structure				LO-4							
8. Preparation	n of detailed	drawings and wri	ting a comprehensive r	eport		LO-6							
9. Detailed co	ost evaluation	n and preparation	or tender documents			LU-5							

		Categor	y Typ	e				A	ssessed	LOs	Weig	ghtage
	Γ		Terr	ns of Re	ference [5%]			LO-1			
			Prog	gress rev	iews [10	%]			LO-1, L0	D-2		
			Indi	vidual h	andwritte	en report	[20%]		LO-1, LO LO-3	D-2,		
Assessm	ents	CA	Inte	rim pres	entation	[15%]			LO-1, LO LO-3, LO	D-2 D-4	100)%
			Viv	a [20%]					LO-1, LO LO-3, LO	D-2 D-4		
			Fina	l presen	tation [1:	5%]			All			
			Fina	l group	report [1]	5%]			All			
Recomme	ended [Fextbook	s Rel	evant ref	erences	will be re	ecommer	nded bas	ed on the	e selecte	d project	
Names of	Lectu	rers	Pro: supe	f. (Mrs.) ervise the	C. Jayas e project	inghe, Pi s	rof. M. T	. R. Jay	asinghe,	Other le	cturers w	ho
Mapping	of Mo	dule Lear	ning Ou	tcomes	(MLO) t	to the Pr	ogramn	ne Outco	omes (PO))		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L	М	М	Н		М	L		Н	Н		М
LO-2	L	М		М		М	Н	М	Н	Н	М	М
LO-3	Н	Н	Н		М	М	Н	М	Н	Н		М
LO-4	Н	Н	Н	М	Н	М	Н	М	Н	Н	L	Н
LO-5						М			Н	Н	Н	М
LO-6									Н	Н		Н
Module	Н	Н	Н	Μ	Н	Μ	Н	Н	н	H	Μ	Н
S	cale:	H – Hig	h	M - 1	Medium		Ι	L – Low				

Module Code	CE4922	Module Title	Research Project							
Credits	4.0		Lectures	-						
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	-	Pre-requisite	es	None			
Module Type:	Core Modu	ule/Compulsory	Electiv	ve 🗖	0	Optional 🗖				
Learning Outco	mes (LOs)									
After completing this module, students should be able to:										
LO-1: <i>identify</i> the problem and research need, overall and specific objectives, and <i>prepare</i> the research proposal,										
LO-2: <i>conduct</i> a comprehensive literature review,										
LO-3: investigate using research-based knowledge and research methods										
LO-4: <i>apply</i> the underlying engineering fundamentals related to the research and <i>analyse</i> , <i>verify</i> and <i>interpret</i> the results, and										
LO-5: <i>derive</i> conclusions and <i>communicate</i> in oral and written form.										
Module Outline	LOs Covered									
Problem Identif <i>Identification of</i> <i>the society, scope</i>	LO-1, LO-2									
Research Projec Preparation of w data collection a	LO-1, LO-2									
Conducting Res Literature survey methods, parama statistical technic	LO-2, LO-3, LO-4									
Research Report Reporting forma compilation of the tools, organisation outputs	LO-5									
*	Category	Type Assessed LO		ssessed LOs	Weightage					
		Research Propos	al Submission [0%]		LO-1					
Assessments		Literature Revie	w Submission [0%]		LO-2					
	CA	Proposal present	ation [5%]	1	LO-1, LO-2, LO-5					
		Progress present								
		Submission of in 4-page summary	nitial draft report & drat [0%]	ît 🔤	LO-3, LO-4	100%				
		Final 4-page sun								
		Submission of presentation and								
		Final Report eva [40%]	luated by supervisor		All					
[Ī	WE	End Semester Ex	kamination		-		-			
Recommended '	Textbooks	As directed by supervisor								
Names of Lecturers		Prof. J. M. S. J. Bandara, Dr. H. L. K. Perera and all senior academic staff								

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М	М		М	L	L	L	L		М	L	Η
LO-2	L	Н		Н	L							Н
LO-3	Н	Н		Н	Н			Н			L	Н
LO-4	Н	Н	М	Н	Н			М				Н
LO-5	Н	Н	М					Н		Н		Н
Module	н	Н	Μ	Н	Н			Н		н	L	Н
Scale: H – High M – Medium L – Low												

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4.3 DESCRIPTION OF HUMANITIES MODULES

Credits 2.0 Hours/Week Lectures 2.0 Pre-requisites None GPA/NGPA GPA GPA Hours/Week Lectures 2.0 Pre-requisites None Module Type: Core Module/Compulsory Elective Ø Optional Learning Outcomes (LOS) After completing this module, students should be able to: Octoinal control of the completing development, that the de to a quantum shift in advancement of engineering and technological development, that bee or originated without the existence of a clear social need for them, but have had an immense impact on society, and LO3: appreciate the importance of innovations in engineering and its development. LOA Covered Module Outline Lock Covered Locient engineering practice: invention of wheel, structures in ancient Greece and Egypt, ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, and advancement in iron making: Invention of internal combustion engine and electrical power generator LO-1, LO-2, LO-3, LO-3, LO-3 Effects of wars [4 h] Industrial revolution [4 h] LO-1, LO-2, LO-3, submarines and advancement in iron making: Invention of synthetic rubber, Radar, nuclear power and synthetic rubber, Radar, nuclear power and synthetic rubors, and technology, GPS LO-1, LO-2, LO-3, L	Module Code	DE2230	Module Title	History and Develop	ment of	Engineering					
GPA/NGPA GPA Hours/Week Lab/Assignments Pre-requisites None Module Type: Core Module/Compulsory Elective Øptional Learning Outcomes (LOS) After completing this module, students should be able to: 0ptional LO-1: appreciate key historical events that led to a quantum shift in advancement of engineering and technological development. LO-2: discuss how some engineering developments have been a direct result of social needs and how other engineering developments that have originated without the existence of a clear social need for them, but have had an immense impact on society, and LO-3: appreciate the importance of innovations in engineering and its development. Module Outline LOs Covered Ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, ancient engineering practice: invention of the steam engine, cotton appreciate the importance of energy: invention of the steam engine, cotton appreciate development and influence of energy: invention of internal combustion engine and electrical power generator LO-1, LO-2, LO-3 Effects of wars [4 h] Industrial revolution [4 h] Lo1, LO-2, LO-3 LO-1, LO-2, LO-3 Synthetic fuel Aucomated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Rapid advancement with new innovations for the existence of mankind LO-1, LO-2, LO-3	Credits	2.0		Lectures	2.0						
Module Type: Core Module/Compulsory Elective Optional Learning Outcomes (LOs) After completing this module, students should be able to: LO-1: LO-2: discussion After completing this module, students should be able to: LO-2: discuss how some engineering developments have been a direct result of social needs and how other engineering developments that have originated without the existence of a clear social need for them, but have had an immense impact on society, and LO-3: appreciate the importance of innovations in engineering and its development. Module Outline LOS Covered LO-1: LO-3: LO-1: LO-3: LO-1: LO-1: LO-2: LO-3: LO-1: LO-2: LO-3: LO-3: LO-1: LO-3: LO-3: <t< td=""><td>GPA/NGPA</td><td>GPA</td><td>Hours/Week</td><td>Lab/Assignments</td><td>-</td><td>Pre-requisite</td><td>es None</td></t<>	GPA/NGPA	GPA	Hours/Week	Lab/Assignments	-	Pre-requisite	es None				
Learning Outcomes (LOs) After completing this module, students should be able to: LO-1: appreciate key historical events that led to a quantum shift in advancement of engineering and technological development, LO-2: discuss how some engineering developments hat hey originated without the existence of a clear social needs and how other engineering developments that hey originated without the existence of a clear social need for them, but have had an immense impact on society, and LO-3: appreciate the importance of innovations in engineering and its development. Module Outline LOs Covered Ancient engineering practice [6 h] LO-1, LO-2 Roman road network, Sri Lankan stupas and extensive irrigation network LO-1, LO-2, IO-3 Industrial revolution [4 h] LO-1, LO-2, LO-3 Industrial revolution and influence of energy: invention of the steam engine, cotton spinning and advancement in irron making; Invention of ateroplanes, airships, LO-1, LO-2, LO-3 LO-3 synthetic fuel Space age [4 h] Regind advancements in rockerry; material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, solar energy LO-1, LO-2, LO-3 Influence of computer technology [4 h] Automated control systems, rapid advancement in complex engineering designs, virtual protorpte testing LO-1, LO-2, LO-3 Individual report and presentation on selected historical engine	Module Type:	Core Mod	ule/Compulsory	Electi	ve 🔽	0	ptional				
After completing this module, students should be able to: LO-1: appreciate key historical events that led to a quantum shift in advancement of engineering and technological development. LO-2: discuss how some engineering developments have been a direct result of social needs and how other engineering developments that have originated without the existence of a clear social need for them, but have had an immense impact on society, and LO-3: appreciate the importance of innovations in engineering and its development. Module Outline LOS Covered Ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, Roman road network, ST Lankan stupas and extensive irrigation network LO-1, LO-2 Industrial revolution [4 b] Industrial revolution and influence of energy: invention of the steam engine, cotton spinning and advancement in iron making; Invention of internal combustion engine and electrical power generator LO-1, LO-2, LO-3 Effects of the First and Second World Wars; Development of aeroplanes, airships, supthetic fiel LO-1, LO-2, LO-3 Space age [4 h] Rapid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS LO-1, LO-2, LO-3 Influence of computer technology [4 h] Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing	Learning Outco	omes (LOs)									
LO-1: appreciate key historical events that led to a quantum shift in advancement of engineering and technological development, LO-2: discuss how some engineering developments have been a direct result of social needs and how other engineering developments that have originated without the existence of a clear social need for them, but have had an immense impact on society, and LO-3: appreciate the importance of innovations in engineering and its development. LOs Covered Ancient engineering practice [6 h] LOs Covered Ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, LO-1, LO-2 Roman road network, Sri Lankan stupas and extensive irrigation network LO-1, LO-2 Industrial revolution (at h] Industrial revolution and influence of energy: invention of the steam engine, cotton spinning and advancement in iron making; Invention of internal combustion engine and electrical power generator LO-1, LO-2, LO-3 Effects of wars [4 h] The effects of the First and Second World Wars; Development of aeroplanes, airships, submarines and automobiles; Invention of synthetic rubber, Radar, nuclear power and synthetic fuel LO-1, LO-2, LO-3 Space age [4 h] Rapid advancements in rocketry, material science, electronics and computers, including lipt-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, solar energy LO-1, LO-2, LO-3 Industrial feelouter technology [4 h] LO-1, LO-2, LO-3 LO-2, LO-3 Automated control sys	After completing	g this module,	students should b	be able to:							
LO-2: discuss how some engineering developments have been a direct result of social needs and how other engineering developments that have originated without the existence of a clear social need for them, but have had an immense impact on society, and LO-3: appreciate the importance of innovations in engineering and its development. LOs Covered Ancient engineering practice: [6 h] LOs Covered Ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, LO-1, LO-2 Roman road network, Sri Lankan stupas and extensive irrigation network LO-1, LO-2 Industrial revolution and influence of energy: invention of the steam engine, cotton LO-1, LO-2, spinning and advancement in iron making; Invention of internal combustion engine and electrical power generator LO-1, LO-2, Effects of wars [4 h] The effects of the First and Second World Wars: Development of aeroplanes, airships, submarines and automobiles; Invention of synthetic rubber, Radar, nuclear power and synthetic fiel LO-1, LO-2, Space age [4 h] Rapid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS LO-3 Influence of computer technology [4 h] Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Influence of computer technology [4 h] Assignments LO-1, LO-2, LO-3	LO-1: appreciat technolog	e key historic ical developn	al events that led t nent,	to a quantum shift in ad	lvancen	nent of engineer	ring and				
LO-3: appreciate the importance of innovations in engineering and its development. Module Outline LOs Covered Ancient engineering practice [6 h] I.O-1, LO-2 Ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, Roman road network, Sri Lankan stupas and extensive irrigation network LO-1, LO-2 Industrial revolution [4 h] Industrial revolution and influence of energy: invention of the steam engine, cotton spinning and advancement in iron making; Invention of internal combustion engine and electrical power generator LO-1, LO-2, LO-3 Effects of wars [4 h] The effects of the First and Second World Wars; Development of aeroplanes, airships, submarines and automobiles; Invention of synthetic rubber, Radar, nuclear power and synthetic fuel LO-1, LO-2, LO-3 Space age [4 h] Rapid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Future scenario [4 h] Type Assessed LOs Weightage Assignments CA Individual Assignment [50 %] LO-1, LO-2, LO-3 100% Assessments CA Individual Assignment [50 %] LO-1, LO-2, LO-3 100% Mee End Semester Examination - -	LO-2: <i>discuss</i> ho engineerin but have	ow some engi ng developme had an immer	neering developm ents that have originate impact on soci	ents have been a direct inated without the exist ety, and	result of	of social needs a f a clear social n	and how other need for them,				
Module Outline LOs Covered Ancient engineering practice [6 h] LO-1, LO-2 Ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, LO-1, LO-2 Roman road network, Sri Lankan stupas and extensive irrigation network LO-1, LO-2, Industrial revolution [4 h] Industrial revolution and influence of energy: invention of the steam engine, cotton spinning and advancement in iron making: Invention of internal combustion engine and electrical power generator LO-1, LO-2, Effects of wars [4 h] The effects of the First and Second World Wars; Development of aeroplanes, airships, submarines and automobiles; Invention of synthetic rubber, Radar, nuclear power and synthetic fuel LO-1, LO-2, Space age [4 h] Ragid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, solar energy LO-1, LO-2, Influence of computer technology [4 h] LO-1, LO-2, LO-3 Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Future scenario [4 h] Assessments LO-1, LO-2, LO-3 Assignments Individual Assignment [50 %] LO-1, LO-2, LO-3 Assessements Category T	LO-3: appreciat	e the importai	nce of innovations	in engineering and its	develo	pment.					
Ancient engineering practice [6 h] ID-1, LO-2 Ancient engineering practice: invention of wheel, structures in ancient Greece and Egypt, LO-1, LO-2 Roman road network, Sri Lankan stupas and extensive irrigation network LO-1, LO-2, Industrial revolution (4 h] Industrial revolution and influence of energy: invention of the steam engine, cotton spinning and advancement in iron making; Invention of internal combustion engine and electrical power generator LO-1, LO-2, Effects of wars [4 h] The effects of the First and Second World Wars; Development of aeroplanes, airships, submarines and automobiles; Invention of synthetic rubber, Radar, nuclear power and synthetic fuel LO-1, LO-2, Space age [4 h] Ragid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, solar energy LO-1, LO-2, Influence of computer technology [4 h] LO-1, LO-2, LO-3 Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Future scenario [4 h] Assessments LO-1, LO-2, LO-3 Assignments Individual Assignment [50 %] LO-1, LO-2, LO-3 Individual report and presentation on selected historical engineering achievements 100% LO-3, Assessments Ca	Module Outline	9					LOs Covered				
Industrial revolution [4 h] Industrial revolution and influence of energy: invention of the steam engine, cotton spinning and advancement in iron making; Invention of internal combustion engine and electrical power generator LO-1, LO-2, LO-3 Effects of wars [4 h] Industrial revolution and influence of synthetic rubber, Radar, nuclear power and synthetic fuel LO-1, LO-2, LO-3 Space age [4 h] Industrial revolution given the result of synthetic rubber, Radar, nuclear power and synthetic fuel LO-1, LO-2, LO-3 Space age [4 h] Rapid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, solar energy LO-1, LO-2, LO-3 Influence of computer technoly [4 h] LO-1, LO-2, LO-3 LO-1, LO-2, LO-3 Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Future scenario [4 h] Individual Assignment [50 %] LO-1, LO-2, LO-3 Assignments Individual Assignment [50 %] LO-1, LO-2, LO-3 Actegory Type Assessed LOs Weightage Weightage Individual Assignment [50 %] LO-1, LO-2, LO-3 100% Actegory Type Assessed LOs Weightage Weightage Individual Assignment [50 %] LO-1, LO-2	Ancient enginee Ancient enginee Roman road net	ering practice ring practice: work, Sri Lan	e [6 h] invention of whee kan stupas and ex	el, structures in ancient tensive irrigation netwo	Greece ork	e and Egypt,	LO-1, LO-2				
Effects of wars [4 h] The effects of the First and Second World Wars; Development of aeroplanes, airships, submarines and automobiles; Invention of synthetic rubber, Radar, nuclear power and synthetic fuel LO-1, LO-2, LO-3 Space age [4 h] Rapid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, solar energy LO-1, LO-2, LO-3 Influence of computer technology [4 h] LO-1, LO-2, LO-3 Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Future scenario [4 h] LO-1, LO-2, LO-3 Assignments LO-1, LO-2, LO-3 1. Individual report and presentation on selected historical engineering achievements LO-1, LO-2, LO-3 Assessments Category Type Assessed LOs Weightage CA Individual Assignment [50 %] LO-1, LO-2, LO-3 100% WE End Semester Examination - - - WE End Semester Examination - - - Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa - -	Industrial revolution [4 h]LO-1, LO-2,Industrial revolution and influence of energy: invention of the steam engine, cottonLO-1, LO-2,spinning and advancement in iron making; Invention of internal combustion engine andLO-3electrical power generatorEffects of wars [4 h]										
Space age [4 h] Rapid advancements in rocketry, material science, electronics and computers, including light-weight materials, satellite radio and television, mobile phone technology, GPS navigation systems, solar energy LO-1, LO-2, LO-3 Influence of computer technology [4 h] LO-1, LO-2, LO-3 Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Future scenario [4 h] LO-2, LO-3 Artificial intelligence, renewable energy and future inventions; Need to appreciate sustainable development with new innovations for the existence of mankind LO-1, LO-2, LO-3 Assignments Individual report and presentation on selected historical engineering achievements LO-1, LO-2, LO-3 Assessments Category Type Assessed LOs Weightage Recommended Textbooks End Semester Examination - - - Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	Effects of wars The effects of th submarines and synthetic fuel	Effects of wars [4 h] The effects of the First and Second World Wars; Development of aeroplanes, airships, submarines and automobiles; Invention of synthetic rubber, Radar, nuclear power and synthetic fuel									
Influence of computer technology [4 h] LO-1, LO-2, LO-3 Automated control systems, rapid advancement in complex engineering designs, virtual prototype testing LO-1, LO-2, LO-3 Future scenario [4 h] Artificial intelligence, renewable energy and future inventions; Need to appreciate sustainable development with new innovations for the existence of mankind LO-2, LO-3 Assignments I. Individual report and presentation on selected historical engineering achievements LO-1, LO-2, LO-3 Assessments Category Type Assessed LOs Weightage CA Individual Assignment [50 %] LO-1, LO-2, LO-3 100% WE End Semester Examination - - Recommended Textbooks Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka.	Space age [4 h] Rapid advancem light-weight mat navigation system	eents in rocket erials, satellit ms, solar ener	try, material scien te radio and televi rgy	ce, electronics and con sion, mobile phone tech	iputers hnology	, including v, GPS	LO-1, LO-2, LO-3				
Future scenario [4 h] Artificial intelligence, renewable energy and future inventions; Need to appreciate sustainable development with new innovations for the existence of mankind LO-2, LO-3 Assignments 1. Individual report and preventation on selected historical engineering achievements LO-1, LO-2, LO-3 Assessments Category Type Assessments LO-1, LO-2, LO-3 CAtegory Individual Assignment [50 %] LO-1, LO-2, LO-3 Assessments CA Category Individual Assignment [50 %] LO-1, LO-2, LO-3 Assessments CA Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	Influence of con Automated cont prototype testing	nputer techn rol systems, 1 g	ology [4 h] rapid advancemer	nt in complex engineer	ring de	signs, virtual	LO-1, LO-2, LO-3				
Assignments 1. Individual report and presentation on selected historical engineering achievements LO-1, LO-2, LO-3 Assessments Category Type Assessed LOs Weightage Assessments Individual Assignment [50 %] LO-1, LO-2, LO-3 100% CA Individual Assignment [50 %] LO-1, LO-2, LO-3 100% WE End Semester Examination - - WE End Semester Examination - - Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. - Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	Future scenario Artificial intelli sustainable deve	9 [4 h] gence, renew clopment with	vable energy and new innovations f	d future inventions; i for the existence of man	Need t kind	o appreciate	LO-2, LO-3				
1. Individual report and presentation on selected historical engineering achievements LO-1, LO-2, LO-3 Assessments Category Type Assessed LOs Weightage Assessments CA Individual Assignment [50 %] LO-1, LO-2, LO-3 100% CA Class Presentation [50%] LO-1, LO-2, LO-3 100% WE End Semester Examination - - Recommended Textbooks Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	Assignments										
Category Type Assessed LOs Weightage Assessments Individual Assignment [50 %] LO-1, LO-2, LO-3 CA Individual Assignment [50 %] LO-1, LO-2, LO-3 CA Class Presentation [50%] LO-1, LO-2, LO-3 WE End Semester Examination - WE End Semester Examination - Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	1. Individual 1	report and pre	sentation on selec	ted historical engineeri	ng achi	evements	LO-1, LO-2, LO-3				
Assessments Individual Assignment [50 %] LO-1, LO-2, LO-3 CA Individual Assignment [50 %] LO-1, LO-2, LO-3 WE End Semester Examination - WE End Semester Examination - Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa		Category	Туре		A	ssessed LOs	Weightage				
CA Class Presentation [50%] LO-1, LO-2, LO-3 100% WE End Semester Examination - - Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	Assossments		Individual Assig	nment [50 %]]	LO-1, LO-2, LO-3					
WE End Semester Examination - Recommended Textbooks Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	Assessments	CA	Class Presentation	on [50%]]	LO-1, LO-2, LO-3	100%				
Recommended Textbooks Sivasegaram, P. S. (2006).History of Engineering in Sri Lanka – A Brief Overview, Centenary Commemoration Publications 1906 – 2006. Institution of Engineers Sri Lanka. Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa		WE	End Semester Ex	xamination		-	-				
Names of Lecturers Dr. L. L. Ekanayake, Prof. W. P. S. Dias, Dr. U. P. Nawagamuwa	Recommended	Textbooks	Sivasegaran Overview, C of Engineer	n, P. S. (2006).History Centenary Commemora s Sri Lanka.	of Eng tion Pu	ineering in Sri I Iblications 1906	Lanka – A Brief 5 – 2006. Institution				
	Names of Lectu	rers	Dr. L. L. Ek	anayake, Prof. W. P. S	S. Dias,	Dr. U. P. Nawa	agamuwa				

Mapping	of Mod	ule Lear	ning Ou	tcomes	(MLO) t	to the Pr	ogramn	ne Outco	omes (PO	O)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1						L	L	М	L	М		L
LO-2						L	L		М	М		
LO-3								L	М	М		L
Module						L	L	L	Μ	Μ		L
S	cale:	H – Hig	h	M – 1	Medium		Ι	L – Low				

Module Code	DE2480	Module Title	Human	Rights							
Credits	2.0	Hound	Lectur	es	2.0	Duo w	anicita		None		
GPA/NGPA	GPA	nours/week	Lab/A	ssignments	-	- Fre-re	equisite	5	None		
Module Type:	Core Mod	ule/Compulsory		Elect	ive 🔽		0	ptional 🗌			
Learning Outc	omes (LOs)	studente should l	a abla ta								
I Q-1: explain the	e basic conce	ents and theories of	f human	rights							
LO-2: <i>discuss</i> thengineeri	ne relevance a ng, and	nd theories in the	applicatio	on of human	rights c	oncepts i	n the fie	ld of			
LO-3: <i>apply</i> cor evaluate	those activitie	an rights law in re s from a human ri	lation to ghts pers	engineering/ pective.	infrastr	ucture de	velopm	ent projec	ets and		
Module Outline	e							LOs C	overed		
Introduction [4 Introduction to and HR mechan	h] Human Rights ism, engineer	s (HR), internation ing ethics and Hu	ıal humaı man Righ	ı rights instru ts	uments,	internati	onal	L	D-1		
Legal system in Sri Lanka [4 h] Introduction to the legal system, the constitution and Fundamental Rights, Right to LO-1 Introduction to the legal system, the constitution and Fundamental Rights, Right to LO-1 Remedy and Remedial Mechanism Human Rights and Engineering [6 h]											
Human Rights Human rights a	and Enginee	ring [6 h] eering, engineerir	ng for hur	nan rights				LO-2			
Human Rights, Engineering and Sustainable Development [6 h] LO-2, LO-3 Rights based approach, Gender and Engineering, HR and Disaster Management, HR and LO-2, LO-3											
Rights Based A	pproach [4 h	als 1]		.,. ,. ,				L	D-3		
Application of	Right Based A Human Righ	<i>ts</i> in Engineering	(BA as m [HRE]	[4 h]	tegy						
HRE in Disas	ter Manager	nent, HRE in 1	Post con	flict Era, l	HRE in	ı Sustai	nable	LO	D-3		
Assignments											
1. Group	project on	identifying Huma	an Right	s related is	sues in	infrastr	ucture	LO-1.	LO-2		
develop	ment projects	3						L	D-3		
	Category	Туре			4	Assessed	LOs	Wei	ghtage		
Assessments	CA	Group project re	eport			All		100	%		
	WE	End Semester E	xaminatio	on		-		-	-		
Recommended	Textbooks	Selected UI	N Human	Rights Conv	rentions						
Names of Lectu	irers	Dr. S. D. B.	Dissana	yake, Dr. H.F	R.Pasino	lu					
Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)											
PO	PO2 1	PO3 PO4 P	O5 PO	D6 PO7	PO8	PO9	PO10	PO11	PO12		
LO-1			Ν	Λ							
LO-2			Ν	Л				_			
LO-3				H H		M	H		H		
				1 M		L	н		Н		
Scale: H – High M – Medium L – Low											

Module Code	DE2510	Module Title	Responsible Citizensh	nip							
Credits	2.0	TT (TT)	Lectures	2.0	D		N				
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	-	Pre-requisit	es	None				
Module Type:	Core Mode	ule/Compulsory	Electiv	ve 🔽		Optio	nal				
Learning Outco	mes (LOs)										
After completing	this module,	students should b	e able to:								
LO-1: express t	hemselves, th	ieir surrounding ai	nd their connection to th	ie soci	ety at large,						
LO-2: acknowl	edge, respect	and <i>engage</i> with o	communities and their c	ulture	for long term v	vellbe	eing,				
LO-3: apprecia	te local action	ns of an individua	l which can have a big i	mpact	on the lives of	peop	le,				
LO-4: demonst	-4: demonstrate awareness of the consequences of the actions of an individual, and										
LO-5: accept in	0-5: <i>accept</i> interdependencies and be socially responsible.										
Module Outline	Iodule Outline										
Me: Identity an Self-confidence, expressed/change	Me: Identity and community in the Cultural Space [4 h] Self-confidence, self-awareness, understand how identities and cultures are formed/ expressed/changed and connected, value different perspectives										
Me and You: C	ommunity co	onversations [6 h]									
Understand diffe	rent compone	ents of the convers	ation, how and when it	can be	used, ability]	LO-1, LO-2,				
to support, learn	and share th	rough dialogue, ir	ntercultural communica	tion an	d tolerance,		LO-3				
ability to suppor	t, learn and s	hare									
We: Local and	global comm	itments [6 h]	· · · · · · · · · · · · · · · · · · ·	1 1							
Unaerstana the	concept of ility to ident	community and	connections between	local ability	ana global]	LO-2, LO-3,				
social developm	ties, ability to identify key stakeholders in the community, ability to identify a evolopment issue to address in the community motivation to act towards										
sustainable deve	lopment	address in inc	community, montant		uer romanas						
Planning social Skills in project	action [6 h]	management				Ι	LO-3, LO-4				
Delivering socia	l action [6 h]]					104105				
Experience impl	ementing soci	al action					LO-4, LO-5				
Application of I	Human Righ	ts in Engineering	[HRE] [4 h]								
HRE in Disast Development	ter Manager	nent, HRE in I	Post conflict Era, Hl	RE in	Sustainable		LO-3				
Assignments											
1. My Ider	ntity – A grap	hical illustration					LO-1				
2. Commu	nity Project -	Proposal Present	ation				All				
3. Debate	on a topic rela	ated to a current is	sue faced by the youth				All				
	Category	Туре		А	ssessed LOs		Weightage				
		My Identity – A [10%]	graphical illustration		LO-1						
Community Project – Proposal Presentation [10%]											
		Debate [20%]									
Assessments	CA	Community Proj [10%]	ect – Progress Evaluati	on	All		100%				
		Community Proj Viva [20%]	ect – Final Evaluation a	and							
		Attendance and class activities [3	active participation in 30%]]	LO-1, LO-4, LO-5						
	WE	End Semester Ex	xamination		-		-				

Recommo Names of	ended To Lecture	extbooks ers	5	1. Wh <i>skil</i> 2. Brit Dr. C. S	etten, D. ls. Hobol ish Cour . A. Siriv	A., & C ken, NJ: ncil. (201 wardana	ameron, Pearson 7). <i>Activ</i>	K. S. (20 Education <i>e Citizer</i>)20). De on. 1s facilit	veloping ator's too	manage olkit.	ment
Mapping	of Modu	ule Lear	ning Ou	tcomes	(MLO) t	to the Pr	ogramn	ne Outco	omes (PO	D)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1						L	L	L	М	М		L
LO-2						L	М	L	М	М		М
LO-3				L		М	М	М	Н	М	L	М
LO-4			L	L		М	М	L	Н	Н	М	М
LO-5			L	L		М	М	М	Н	Н	М	М
Module			L	L		Μ	Μ	Μ	Н	Μ	Μ	Μ
S	Scale: $H - High$ $M - Medium$ $L - Low$											

4.4 DESCRIPTION OF MODULES – OTHER DEPARTMENTS

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Module Co	ode	CS1032	Mod	ule Title	Pro	ogrammi	ng Funda	amentals				
Credits		3.0		/***	Le	ctures		2.0	D /G		•.	
GPA/NGP	A	GPA	- Hou	rs/Week	La	b/Assign	ments	3/4	Pre/C	o- requis	sites	None
Module Ty	pe:	Core Mo	dule/C	ompulsory			Electi	ive 🗖	1	Opt	ional 🗖	
Learning (After comp	Dutcon leting	nes (LOs) this modu	le, stude	ents should	be ab	le to:						
LO-1: devid	<i>ce</i> algo	rithms to	solve si	mple comp	outatio	nal probl	ems,					
LO-2: <i>deve</i> LO-3: <i>deve</i>	<i>lop</i> pro <i>lop</i> pro	ograms fro ograms for	m algor simple	rithms usin control ap	g a hig plicati	gh level p ons using	orogramr g embedo	ning lang ded hard	guage (e ware pla	g. Pythoi tforms	n) and	
Module Ou	ıtline											
Admin mat Python Data repres Problem so Computer s Practical V	ters, In entatio lving system Vork	troduction on & hardwa	n to con re	nputing								
1. Prog	rammi	ng labora	tory cla	sses								
	C	ategory				Ту	pe				Wei	ghtage
			Six e	evaluated p	rogran	nming la	b classes	[6%]				
Assessmen	ts	CA	Prog	ramming p	orobler	n 1 [7 %]					20	%
		Ch	Prog	ramming p	orobler	n 2 [7 %]						
		WE	End	Semester I	Examir	nation					80	%
Recommen Textbooks	ded			 Pyth Pyth Pyth Pyth Intro Dev Ardu http http 	ion Tu ion Tu ion doo oductic elopmuino ://ardu	torial at h torial at h cumentat on to Con ent Focus Tutor ino.cc/en v.ladyada	nttps://w nttps://dc ion at htt nputing 1 s by Ljub ials /Tutorial n.net/lear	ww.tutor ocs.pytho tps://doc Using Py oomir Pe (e.g., //HomeP n/arduin	ialspoin on.org/3/ s.python rthon: Ar rkovic dage, o/)	t.com/py tutorial/ .org/3.6/ n Applic:	thon3/ ation	
Names of I	ectur	ers]	Prof. S. Jay	/asena	, Dr. C. I	De Silva,	Dr S. Pe	erera, Dr	. C. Gam	lage	
Mapping o	f Mod	ule Learr	ing Ou	tcomes (N	1LO) 1	to the Pr	ogramn	ne Outco	omes (PO	O)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	Н	Н	Н		М				Н	М		М
LO-2	М	Н	Н		Н				Н	Н		Н
LO-3	М	М	М		Η				Н	М		Н
Module	Μ	Н	Н		Н				Н	М		Н
Sca	ale:	H – High		M – M	edium		Ι	L – Low				

Module Code	CS2850	Module Title	Visual Programming							
Credits	2.0	TT /TT 1	Lectures	1.0	D	N				
GPA/NGPA	NGPA	Hours/ week	Lab/Assignments	3/1	Pre-requisit	ies None				
Module Type:	Core Mode	ule/Compulsory	Electiv	re 🔽		Optional 🗖				
Learning Outcome After completing	mes (LOs) this module,	students should b	e able to:							
LO1 - apprecia	te the differ	ence between st	ructured and visual p	rograi	nming approa	aches, and				
LO2 - <i>develop</i> s environm	software for ent.	engineering and	d other applications u	sing a	visual progra	amming				
Module Outline						LOs Covered				
Introduction [4] Overview of the	h] NET Framew	vork, Objects, Pro	perties & Methods, VB	Interfa	ice & GUIs	LO-1, LO-2				
Variables, Data Introduction to th	Types & Fo he concept of	rmats [4 h] variables, data ty	pes and data conversior	ı		LO-1, LO-2				
Program Flow [Selection and ite structure, For-Ne	8 h] eration struct ext loops, Do	tures – IF structu loops	vre, IF operator, IFF f	unctio	n, Select-Case	LO-2				
Procedures & Functions [4 h] LO-2 Use of sub procedures and function procedures LO-2										
Debugging [04 h Debugging pract	Debugging [04 hrs] LO-2									
Arrays [4 h] Use of single di arrays, string ma	mension arr	ays, sorting, intro	oduction to multi-dimen	nsiona	l and jagged	LO-2				
Additional Data Enumerations, St	Types [4 h] atic data typ	es, Type inference	, Nullable data types, Si	tructur	·es	LO-2				
File Handling [4 Use of files in Vis	h] sual Basic					LO-2				
Databases [4 h] Introduction to da	atabases in V	visual Basic, Use o	of SQL			LO-2				
Classes [4 h] Introduction to V	isual Basic c	lasses				LO-2				
Practical Work										
Laboratory sess	sions on eac	h of the units				LO-1, LO-2				
Assignments (In	-Class)									
1. Design of	of Interface a	nd simple progran	nme			LO-1, LO-2				
2. Use of m	natters covere	ed up to Unit 5				LO-1, LO-2				
3. Use of m	natters covere	ed up to Unit 10				LO-1, LO-2				
	Category	Туре		A	ssessed LOs	Weightage				
Assessments	СА	Laboratory Sess 2 & 5 [25%]	ions for all except Units	1,	LO-1, LO-2	100%				
A350351101105		In-Class Assign	ments [75%]		LO-1, LO-2	20070				
	WE	End Semester Ex	xamination		-	-				
Recommended 7	Recommended Textbooks Programming Visual Basic 2008 by Tim Patrick, O'Reilly publishers.									
Names of Lectur	rers	Eng SN Nile	es							

Mapping	of Mod	ule Lear	ning Ou	tcomes	(MLO) (to the Pr	ogramn	ne Outco	omes (PO	0)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	L				L							М
LO-2	М	L	М		Μ			L		М		М
Module	М	L	Μ		Μ			L	L	Μ		Μ
S	cale:	H – Hig	h	M - I	Medium		Ι	L – Low				

Module C	Code	EE	21012	Mod	lule Title	Ele	ctrical Er	igineerin	g			_		
Credits		2	2.0	Hou	na/Woolz	Leo	ctures		1.5	Dro/C	o roquic	itor		Jona
GPA/NG	PA	C	βPA	поu	rs/ week	Lal	o/Assign	ments	3/2	Pre/C	o- requis	sites	Г	None
Module T	ype:	Со	re Mo	dule/C	ompulsor	у 🔽		Electi	ive 🗆		Op	otiona	ıl 🗖	
Learning	Outcon	nes (LOs)	4 1	. 1		ч.,							
After com LO-1: use	correct	this n SI ui	nodui nits.	e, stua	ents shou	ld be ab	ole to:							
LO-2: pro	<i>ject</i> an o	overa	ll pic	ture of	Electrical	l Engine	eering,							
LO-3: per	form D0	C, AC	C and	transie	nt calcula	tions,	0,							
LO-4: and	<i>ilyse</i> coi	nplex	x alte	rnating	current c	ircuits a	and give s	solutions						
LO-5: app	ly diffe	rent t	ypes	of mate	ers for ele	ctrical 1	neasuren	nents and	l					
LO-6: dra	w up co	mple	te wi	ring cir	cuit of a l	nouseho	old and ap	opreciate	the im	portance	of differ	ent pi	rotect	tion.
			1.	SI Un	its									
			2. 3	Basic	DC circu	it analy	sis: Circi	ring iit eleme	nts cir	cuit law	eircuit :	soluti	ons	
			4.	Trans	ient sol	ution	of simp	le RLC	circi	uits AC	Theor	y: P	haso	r
Module				repres	entation,	comple	ex repres	entation,	impe	lance, a	dmittance	e, cor	npley	κ.
Outline			5	power Flectr	and ener	gy, pov	ver factor	r, AC ciro	cuit cal	culation	s and rec	tifier	type	a.
			5.	meter	s, bridge	method	s, power	and ener	gy met	ers, wor	king prine	ciples	, ij pi	0
			6.	Electr wiring	ical Insta g circuit	llations	: Fuses,	MCBs, I	ELCBs	, wires,	complete	hous	eholo	1
Method o	f		Cor	tinuou	s assessm	ents (20)%)							
Assessme	nt		Fina	al writte	en exams	(80%)								
Recomme	nded		1.	Electi	rical Engi	neering	Fundam	entals, V	incent	Del Tor	o, Prentic	e Hal	l of I	ndia,
Textbook	S		2	New I	Deini Illustrat	ad Guid	e to The	Wiring F	Pogulat	ions IIE	E July 1	002		
			2. 3.	Schau	m's 3000) solved	l problem	is in Elec	tric Ci	rcuits. N	cGraw-F	JJ∠ Hill B	ook (Co
				Syed	A. Nasse	r	- prooren						0011	
Names of	Lectur	ers		Prof. S	. Kumara	wadu,	Dr. S. K.	Abeygu	naward	ana, Dr.	W. D. Pr	asad		
Linkage l	hetween	1	Ass	essmen	t				L	.01 LO	2 LO3	LO4	LO	5 LO6
LOs and	Jetween	L		CA	La	borator	y Experii	nents 1, 2	2, 3		-			\checkmark
Assessme	nts		End	Semes	ter Exam	ination				$\sqrt{-\sqrt{-1}}$	\checkmark			\checkmark
Mapping	of Mod	ule I	learn	ing Ou	tcomes (MLO)	to the Pr	ogramn	ne Out	comes (l	PO)			
	PO1	PC	02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PC	011	PO12
LO-1	L			L										
LO-2				L										
LO-3	М			L										
LO-4	Н				L									
LO-5	М					L	L							
LO-6	L						М							
Module	М			L			L							
S	cale:	H –	High		M – N	/ledium		Ι	L – Lov	v				

Module (Code	EL101	2 M	odule Titl	e La	anguage S	Skill Enha	anceme	ent I				
Credits		1.0			L	ectures		-					
GPA/NG	PA	GPA		ours/Weel	s La	ab/Assig	iments	3/1	- Pre/C	o- requi	sites	EL10	10*
Module T	уре:	Core M	odule/	Compulsor	y 🔽		Elect	ive 🗆		Op	tional		
Learning After com	Outcom pleting	mes (LOs this modu) le, stud	lents shou	ld be al	ole to:							
LO-1: de fo	<i>emonstr</i> orms an	<i>rate</i> an uno	lerstan ge critio	ding of inf cally with	ormation the idea	on, opinic as thus pro	ons and and an esented,	gumer	its presen	ted in w	ritten o	r oral	
LO-2: ad p	<i>dapt</i> ma resenta	aterial prep tion/assigr	ared in ment),	n one form	for pre	sentation	in anoth	er – e.g	g. (from a	reading	text to	a	
LO-3: co so co	ommuni etting ir onventi	<i>icate</i> techr n different ons and	ical (i. modes	e. Enginee : written, o	ring/IT oral, au	/Architec dio-visua	ture) info l and graj	ormatic phic fo	n effectiv llowing in	vely in the nternatio	e acad nally a	emic ccepted	1
LO-4: co	ommuni	icate effec	tively	with non-s	pecialis	t audienc	es in task	s relat	ed to his/l	ner area	of spec	ialisatio	on.
Module C	Outline										LOs	Covere	ed
Commun Get acqua	ication <i>uinted, d</i>	- Prepara	a tion f vriting	o <mark>r academ</mark> , <i>fact and</i> i	t ic stud theory	ly					LO- LO-	1, LO-2 3, LO-4	2, 4
Systems - Description and definitionLO-1, LO-2,Description and definition, static descriptions, building academic vocabularyLO-3, LO-4											2, 1		
Organisa Classifica	tion – (tion, flo	Classificat	ion sign-p	ost langua	ge				<u> </u>		LO-	1, LO-2 3, LO-4	2,
Change - Cause and	Proces <i>l effect</i> ,	s writing different	types o	f processe:	s, linea	r process	es				LO- LO-	1, LO-2 3, LO-4	2, 4
Education Mechanist	n - Con ms of h	nparison a	and co r, heat	ntrast transfer a	pplicat	ions in en	gineering	2			LO- LO-	1, LO-2 3, LO-4	2, 4
		Categor	y I		Т	уре			Assessed	LOs	Weig	ıtage	
Accore	anta	C A	Co	ntinuous a	ssessm	ent 1 [10	%]		All			200/	
ASSESSIII	ents	CA	Co	ntinuous a	ssessm	ent 2 [10	%]		All			20%	
		WE	En	d Semeste	r Exam	ination			All			80%	
Names of	Lectur	rers	M Vi	r. S. P. He siting staf	wa, Mr f	. S. J. Gu	nawarder	na, Mr.	W. M. P.	Y. B. R	athnay	ake,	
Mapping	of Moo	lule Lear	ning O	utcomes (MLO)	to the Pi	ogramm	e Out	comes (P	0)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1	1 PO	012
LO-1		L		L				L	М	Н		Ν	Л
LO-2		L						L	М	Н		Ν	Л
LO-3		L		L				L	М	Н		Ν	Л
LO-4		L		L				L	Μ	Н		Ν	Л
Module		L		L				L	Μ	H		Ν	1
S	Scale: H – High M – Medium L – Low												

Module C	Code	EL102	2 M	odule Titl	e La	anguage S	skill Enha	ancemer	nt II			
Credits		1.0			L	ectures		-	D /G		•	EL 1010
GPA/NG	PA	GPA		ours/Weeł	L	ab/Assigr	nments	3/1	Pre/Co	o- requis	sites	EL1012
Module T	ype:	Core M	odule/	Compulsor	y 🔽	Ī	Elect	ive 🗖	•	Opt	ional	
Learning After com	Outcom pleting	mes (LOs this modu) ile, stud	lents shoul	ld be al	ole to:						
LO-1: de er	emonstr ngage c	ate under ritically w	standin vith ide	g and expr as,	ess ide	as, opinio	ns, argun	nents in	written a	and oral i	forms	and to
LO-2: sy	nthesis	e and sun	marise	informatio	on from	n differen	t sources,	,				
LO-3: us	se diffe	rent acade	mic dis	course stru	ictures	to develo	p argume	ents and				
LO-4: co se	ommun etting ir onventi	icate techi different ons.	nical (i. modes	e. Enginee : written, c	ring/IT oral, au	/Architec dio-visual	ture) info l and graj	ormation phic, fol	effectiv lowing in	ely in the nternatio	e acado nally a	emic ccepted
Module C	Outline										LOs	Covered
Aptitude – Connecting IdeasLO-1, LO-2,Structure of a text, linking ideas, conclusionsLO-3, LO-4												
Analysis – Fact and Opinion LO-1, LO-2, LO-3, LO-4 Fact and opinion, citations and referencing, interviews and discussion LO-1, LO-2, LO-3, LO-4												
Persuasio Persuasio	n – De n, argu	veloping a ment, eva	an Arg luation	ument							LO-3	, LO-2, , LO-4
Autonom Summaris	y – Sur ing, not	nmarisin e taking,	g spoken	punctuatic	on						LO- LO-	l, LO-2, 3, LO-4
Technolog Problem s	gy - Ev olution	aluation texts, eva	luation	– problem	ı/soluti	on, analy.	sis and ev	valuatio	n		LO- LO-	l, LO-2, 3, LO-4
		Categor	y		Г	уре		А	ssessed	LOs	Weigh	itage
Assessme	ents	CA	Co	ntinuous a	ssessm	ent 1 [109	%]		All			20%
1255055511		en	Co	ntinuous a	ssessm	ent 2 [109	%]		All		-	2070
		WE	En	d Semester	r Exam	ination			All		8	30%
Names of	Lectur	ers		r. S. P. He siting staff	wa, Mr	. S. J. Gu	nawarder	na, Mr. V	W. M. P.	Y. B. Ra	athnay	ake,
Mapping	of Moo	lule Lear	ning O	utcomes (MLO)	to the Pr	ogramm	e Outco	omes (PO	D)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1	I PO12
LO-1		L		L				L	М	Н		М
LO-2		L						L	М	Н		М
LO-3		L		L				L	Μ	Н		М
LO-4		L		L				L	M	H		M
Module		L		Ĺ				L	M	H		M
S	Scale: H – High M – Medium L – Low											

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Module Code	MA1013	Module Title	Mathematics					
Credits	3.0	Harry (Wash	Lectures		3.0	Drug/Carrow		Naua
GPA/NGPA	GPA	Hours/ week	Lab/Assignme	nts	3/1	Pre/Co- req	uisites	None
Module Type:	Core Modu	lle/Compulsory		Electiv	ve 🗖	(Optional	
Learning Outcome After completing	mes (LOs) this module,	students should b	e able to:					
LO-1: use discret	e mathematio	cal structures such	as Logic and Set	t Theo	ry in ap	oplications,		
LO-2: use algebra	aic structures	such as Real Nur	nbers, Vectors an	d Mat	rices in	applications a	and	
LO-3: apply the b	pasic concept	s of limits, differe	ntiation and integ	gration	ı in eng	ineering appli	cations	
Module Outline							LOs	Covered
Logic and Set T Proposition Techniques Sets, cardin Relations, f logic gates,	heory s, truth table of proof: dir pality, Cartes unctions, Boo Karnaugh m	s, symbolic staten ect, contradiction, ian product, order plean algebra: dis paps, minimization	tents, conditional , induction, pigeo red pairs junctive and conj and applications	conne m-hole iunctiv	ectives, e princi ve norm	quantifiers ple al forms,		LO-1
Real Analysis Real numbe Basic functu inverses Limit of a fu Rolle's theo Sequences of Tests for co	L	.O-2, LO-3						
Vectors, and Ma Vector alge product Equations of Matrix oper determinan Systems of J	ntrices bra, vector p of lines and p rations, trans ts linear equation	roduct, scalar pro lanes pose, adjoint and ons	oduct, scalar triple	e prod ix, ech	luct, ve helon fo	ctor triple orms, rank,		LO-2
	Category		Туре		Α	ssessed LOs	Weig	htage
Assessments	СА	Spot Tests [10% Midterm Examir] nation [10%]			All All		20%
	WE	End Semester Ex	xamination			All		80%
Recommended 7	ſextbooks	 Discret Taylor Introdu Thomp: Elemen M. Bru Elemen Engine Engine Schaun 	e Mathematics fo action to Finite Ma son atary Real Analysi ckner atary Real Analysi ering Mathematic ering Mathematic a's Outline Series	athem is – Bi is – S. cs Voli cs – Di c – Vec	v techno atics – rian S. 2 Naraya umes Ia ass ctors an	ology – Rowan John J. Kemen Thomson, Judi an, M. D. Rais and II – S. S. S ad Matrices	Garnier ny, Snell ith B. Br inghania astry	r and John , G. L. uckner, A.
Names of Lectur	rers	Mr. R. Dissanay	vaka, Mr. U. A. Se	enevir	athne, l	Ms. H. V. S. E	e Silva	

Mapping	of Mod	ule Lear	ning Ou	tcomes	(MLO) t	to the Pr	ogramn	ne Outco	omes (PO	O)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	Н											L
LO-2	М											L
LO-3	М											М
Module	Μ											Μ
Scale: H – High M – Medium L – Low												

Credits 3.0 Hours/Week Lectures 3.0 Pre/Co-requisites MA1013 GPA/NGPA GPA GPA Lab/Assignments 3/1 Pre/Co-requisites MA1013 Module Type: Core Module/Compulsory Image: Core Module/Compulsory Imagee: Core Module/Compulsory Imagee: Core Module/Compulsory Imagee: Core Module/Compulsore: Module/Compulsory Imagee: Core Modue/Compulsor	Module Code	MA1023	Module	Title	Methods Mathemat	tics						
GPA/NGPA GPA Hours/Week Lab/Assignments 3/1 Pre/Co- requisites MA1013 Module Type: Core Module/Compulsory Image: Core Module/Compulsory Image	Credits	3.0		K7 1	Lectures	3.0	D 10	• •	2441012			
Module Type: Core Module/Compulsory Image: Core Elective Optional Learning Outcomes (LOS) After completing this module, students should be able to: 0.1 LO-1: solve a non-linear equation in a single variable, to a desired accuracy, LO-3: solve the first order non-linear ordinary differential equations and initial value problems involving second order linear ordinary differential equations. LO-4: apply multivariate calculus to solve simple engineering problems and LO-5: apply statistical skills and use probability distributions for decision making in engineering. LOs Covered Numerical Methods Algorithms and errors Numerical Solution of non-linear equations. Bisection and false position methods, simple iterations. Newton-Raphson method; LO-1, LO-2 Numerical Methods Algorithms and celevation of convergence. Approximations of functions LO-1, LO-2 Ordinary Differential equations: Reducible forms Functions of several variables: partial differentiation, chain rule, directional derivatives LO-3, LO-4 Basic Probability and Statistics Conditional probability and Statistics LO-5 Conditional probability and Statistical indicators in data analysis, correlation coefficients LO-5 Basic Probability and Statistical indicators in data analysis, correlation coefficients LO-5 Maxima and minima, Lagrange multipliers Assesse	GPA/NGPA	GPA	Hours/W	veek	Lab/Assignments	3/1	- Pre/Co- r	equisites	MA1013			
Learning Outcomes (LOs) After completing this module, students should be able to: LO-1: solve a non-linear equation in a single variable, to a desired accuracy, LO-2: integrate a function of a single variable numerically, to a desired accuracy, LO-3: solve the first order non-linear ordinary differential equations and initial value problems involving second order linear ordinary differential equations, and initial value problems involving second order linear ordinary differential equations. and initial value problems involving second order linear ordinary differential equations. and initial value problems and LO-3: solve the first order non-linear ordinary differential equations for decision making in engineering. LO-4: apply statistical skills and use probability distributions for decision making in engineering. Module Outline LOs Covered Numerical Methods Algorithms and errors Numerical integration: Trapezoidal rule, Simpson's rule LO-1, LO-2 Ordinary Differential Equations: Reducible forms LO-1, LO-2 Numerical integration: Trapezoidal rule, Simpson's rule LO-3, LO-4 Taylor series expansion of multivariate functions LO-3, LO-4 Basic Probability and Statistics Condinary differential equations: Reducible forms Functions of several variables: partial differentiation coefficients LO-5 Basic Probability and Statistics Probability and Cumulative distributio	Module Type:	Core Mod	ule/Compu	ulsory	V	Elective	e 🗖	Optional				
LO-1: solve a non-linear equation in a single variable, to a desired accuracy, LO-2: integrate a function of a single variable numerically, to a desired accuracy, LO-3: solve the first order non-linear ordinary differential equations and initial value problems involving second order linear ordinary differential equations, LO-4: apply multivariate calculus to solve simple engineering problems and LO-5: apply statistical skills and use probability distributions for decision making in engine=rime. Module Outline LOs Covered Numerical Methods Isos Covered ordinary differential equations. Bisection and false position methods, simple iterations. Newton-Raphson method; Estimation of errors and acceleration of convergence. Approximations of functions Numerical integration; Trapezoidal rule, Simpson's rule LO-1, LO-2 Ordinary Differential equations: Variable separable, homogeneous and exact equations Second order differential equations: Reducible forms Functions of several variables: partial differentiation, chain rule, directional derivatives Maxima and minima, Lagrange multipliers LO-3, LO-4 Maxima and minima, Lagrange multipliers LO-5 Taylor series expansion of multivariate functions LO-5 Discrete and continuous random variables. Probability and cumulative distribution functions, join distribution functions und software LO-5 Maxima and minima, Lagrange multivariate functions and their applications. LO-5 Basic statistical indicators in	Learning Outcon After completing t	nes (LOs) this module,	students sl	hould b	be able to:							
LO-2: integrate a function of a single variable numerically, to a desired accuracy, LO-3: solve the first order non-linear ordinary differential equations and initial value problems involving second order linear ordinary differential equations, LO-4: apply statistical skills and use probability distributions for decision making in engineering. Module Outline LOs Covered Numerical Methods Algorithms and errors Numerical solution of non-linear equations. Bisection and false position methods, simple irerations. Newton-Raphson method; LO-1, LO-2 Estimation of errors and acceleration of convergence. Approximations of functions LO-1, LO-2 Numerical integration; Trapezoidal rule, Simpson's rule LO-1, LO-2 Ordinary Differential Equations and Multivariate Calculus Reimann integration First order ordinary differential equations: Reducible forms LO-3, LO-4 Maxima and minima, Lagrange multipliers Taylor series expansion of multivariate functions Basic Probability and Statistics Conditional probability, Bayes' theorem. Discrete and continuous random variables. Probability and cumulative distribution functions, joint distribution functions LO-5 Basic statistical indicators in data analysis, correlation coefficients All 10% Inform, Binomial, Poisson and Normal distributions and their applications. LO-5 Basic statistical in	LO-1: solve a non	-linear equat	tion in a sir	ngle va	riable, to a desired ac	curacy,						
LO-4: apply multivariate calculus to solve simple engineering problems and LO-5: apply statistical skills and use probability distributions for decision making in engineering. Module Outline LOs Covered Numerical Methods Algorithms and errors Numerical solution of non-linear equations. Bisection and false position methods, simple iterations. Newton-Raphson method; LO-1, LO-2 Estimation of errors and acceleration of convergence. Approximations of functions Numerical integration; Trapezoidal rule, Simpson's rule LO-1, LO-2 Ordinary Differential Equations and Multivariate Calculus LO-3, LO-4 Reimann integration First order ordinary differential equations: Variable separable, homogeneous and exact equations LO-3, LO-4 Maxima and minima, Lagrange multipliers Taylor series expansion of multivariate functions LO-3, LO-4 Basic Probability and Statistics Ordination of continuous random variables. Probability and cumulative distribution functions. LO-5 Basic statistical indicators in data analysis, correlation coefficients LO-5 Introduction of Minitab - statistical software Spot Tests All 10% Maxima and minima, Logrange multipliers Spot Tests All 10% Maxima and continuous randon variables. Probability and cumulative distr	LO-2: <i>integrate</i> a LO-3: <i>solve</i> the fin second order	function of a rst order non r linear ordin	a single van I-linear ord nary differe	riable n linary d ential e	numerically, to a desir lifferential equations a quations,	red accur and initia	acy, al value proble	ems involv	ving			
LO-5: apply statistical skills and use probability distributions for decision making in engineering. LOs Covered Numerical Methods Algorithms and errors Numerical solution of non-linear equations. Bisection and false position methods, simple iterations. Newton-Raphson method; Estimation of errors and acceleration of convergence. Approximations of functions Numerical integration; Trapezoidal rule, Simpson's rule LO-1, LO-2 Ordinary Differential Equations and Multivariate Calculus Reimann integration First order ordinary differential equations: Variable separable, homogeneous and exact equations Second order differential equations: Reducible forms Functions of several variables: partial differentiation, chain rule, directional derivatives Maxima and minima, Lagrange multipliers Taylor series expansion of multivariate functions Basic Probability and Statistics Conditional probability, Bayes' theorem. Discrete and continuous random variables. Probability and cumulative distribution functions, joint distribution functions Uniform, Binomial, Poisson and Normal distributions and their applications. Basic statistical indicators in data analysis, correlation coefficients Introduction of Minitab - statistical software LO-5 Assessments CA CA Midterm Examination All Spot Tests All All Numer of Lecturers Prof. T S G Peiris, Dr. P. Edirisinghe, Dr. U. Jayatilake	LO-4: apply multi	variate calcu	ulus to solv	/e simp	le engineering proble	ems and						
Module Outline LOs Covered Numerical Methods Algorithms and errors Numerical solution of non-linear equations. Bisection and false position methods, simple iterations. Newton-Raphson method; Estimation of errors and acceleration of convergence. Approximations of functions Numerical integration; Trapezoidal rule, Simpson's rule LO-1, LO-2 Ordinary Differential Equations and Multivariate Calculus Reimann integration Reimann integration LO-3, LO-4 First order ordinary differential equations: Variable separable, homogeneous and exact equations Second order differential equations: Reducible forms Functions of several variables: partial differentiation, chain rule, directional derivatives Maxima and minima, Lagrange multipliers Taylor series expansion of multivariate functions LO-3, LO-4 Basic Probability and Statistics Conditional probability, Bayes' theorem. Discrete and continuous random variables. Probability and cumulative distribution functions, joint distribution functions Uniform, Binomial, Poisson and Normal distributions and their applications. Basic statistical indicators in data analysis, correlation coefficients Introduction of Minitab - statistical software LO-5 Assessments CAtegory Type Assessed LOS Weightage CA Spot Tests All 10% WE End Semester Examination All 80%	LO-5: apply statis	tical skills a	nd use prol	bability	distributions for dec	ision ma	king in engine	ering.				
Numerical Methods Algorithms and errors Numerical solution of non-linear equations. Bisection and false position methods, simple iterations. Newton-Raphson method; Estimation of errors and acceleration of convergence. Approximations of functions Numerical integration; Trapezoidal rule, Simpson's rule Ordinary Differential Equations and Multivariate Calculus Reimann integration First order ordinary differential equations: Variable separable, homogeneous and exact equations Second order differential equations: Reducible forms Functions of several variables: partial differentiation, chain rule, directional derivatives Maxima and minima, Lagrange multipliers Taylor series expansion of multivariate functions Basic Probability and Statistics Conditional probability, Bayes' theorem. Discrete and continuous random variables. Probability and cumulative distribution functions. Inform, Binomial, Poisson and Normal distributions and their applications. Basic statistical indicators in data analysis, correlation coefficients Introduction of Minitab - statistical software CA Spot Tests Midterm Examination All 10% WE End Semester Examination All	Module Outline							LOs	Covered			
Introduction of Minitab - statistical software Assessed LOs Weightage Assessments Category Type Assessed LOs Weightage Assessments CA Spot Tests All 10% Midterm Examination All 10% WE End Semester Examination All 80% Names of Lecturers Prof. T S G Peiris, Dr. P. Edirisinghe, Dr. U. Jayatilake	Numerical Metho Algorithms and e. Numerical solutio iterations. Newton Estimation of error Numerical integrat Ordinary Differe Reimann integrati First order ordina equations Second order diffe Functions of seven Maxima and minin Taylor series expan Basic Probability Conditional proba Discrete and conti functions, joint dis Uniform, Binomia Basic statistical in	ods rrors on of non-lin a-Raphson m rs and accel tion; Trapez on traped ry differenti erential equa ral variables na, Lagrang usion of mu and Statist ubility, Baye. inuous rand stribution fun l, Poisson and idicators in o	ear equation tethod; leration of coidal rule, ions and N al equation al equation titions: Red trivariate ful tivariate ful is s' theorem. om variable nctions nd Normal data analy:	ons. Bi conver <u>, Simps</u> Multive ns: Var lucible j ifferent ers function ces. Pro	section and false posi on's rule ariate Calculus iable separable, home forms iation, chain rule, dir s bability and cumulati nutions and their apple	ition met ns of fun ogeneou rectional ive distri ications.	hods, simple ctions s and exact derivatives bution	LO- LO-	-1, LO-2 -3, LO-4 LO-5			
Assessments CA Spot TestsAll10%WEEnd Semester ExaminationAll10%Names of LecturersProf. T S G Peiris, Dr. P. Edirisinghe, Dr. U. Jayatilake	Introduction of M	Cat	egorv	vare	Туре	A	Assessed LOs	Weig	htage			
Assessments CA Sport resis An 10% Midterm Examination All 10% WE End Semester Examination All 80% Names of Lecturers Prof. T S G Peiris, Dr. P. Edirisinghe, Dr. U. Jayatilake			<u> </u>	Spot Te	etc		Δ11		10%			
WE End Semester Examination All 80% Names of Lecturers Prof. T S G Peiris, Dr. P. Edirisinghe, Dr. U. Jayatilake	Assessments	0	CA N	Aidtern	n Examination		All		10%			
Names of Lecturers Prof. T S G Peiris, Dr. P. Edirisinghe, Dr. U. Jayatilake		v	VE E	End Ser	nester Examination		All		80%			
	Names of Lecture	Names of Lecturers Prof. T S G Peiris, Dr. P. Edirisinghe, Dr. U. Jayatilake										

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	М				L							L
LO-2	Н				L							L
LO-3	М											L
LO-4	М											L
LO-5	L				L							L
Module	Μ				L							Μ
S	Scale: H – High M – Medium L – Low											

Module C	ode	MA2013	N	Iodule Tit	le D	Differentia	l Equat	tions						
Credits		2.0			L	ectures			2.0	D	10	• • •	MA 1002	
GPA/NGI	PA	GPA		lours/ wee	L	.ab/Assig	nment	s	-	– Pr	e/Co- req	luisites	MA1023	
Module T	ype:	Core Mod	ule/Co	ompulsory	I	>		Elec	tive		Opti	onal 🗖		
Learning After com	Outcon pleting	mes (LOs) this modu) le, stu	dents shou	ld be a	ble to:								
LO-1: app	oly Fou	rier series	appro	ximations	for per	iodic func	tions ii	n rea	l worl	d situat	ions,			
LO-2: sol	ve initi	al-bounda	ry-valı	ue problem	is invol	lving parti	al diffe	erent	ial equ	ations	and			
LO-3: <i>app</i> app	<i>bly</i> Lap licatior	lace transf 1s.	form a	nd Fourier	transfo	orm metho	ods to s	solve	differ	ential e	equations	in engi	neering	
Module O	utline											LOs (Covered	
Fourier So Fourier co Trigonome	e ries A pefficier etric ap	pproxima nts, Dirich proximatio	ition let's c on to c	ondition, o liscrete da	dd and ta	l even func	ctions.	Half	range	e series		L	0-1	
Partial Differential Equations Classification of second-order partial differential equations Solutions by separation of variables Fourier series application to boundary value problems Laplace Transform and Applications Laplace transforms of elementary functions and some basic theorems on Laplace														
Laplace T Laplace transform Application differentia Transfer fu	Laplace Transform and Applications Laplace transforms of elementary functions and some basic theorems on Laplace transform Application of Laplace transforms to solution of differential equations and system of differential equations Transfer functions, convolution theorem, concepts of stability and controllability													
Non-period application	dic fune ns	ction, Fou	rier tr	ansforms, j	propert	ties of Fou	rier tr	ansfe	orm ar	ıd		L	D-3	
		Cate	egory		Ty]	ре		Asse	essed 1	LOs		We	ightage	
	- 4 -2	C	٨	Quizzes					А	11		2	0%	
Assessmen	itts			Midterm	Exami	nation			А	11		1	0%	
		W	Е	End Sem	ester E	xaminatio	n		А	11		7	0%	
Names of	Lectur	ers		Mr. R.	Dissana	ayake, Mr	U. A.	Sen	evirath	nne, Dr	. U. Jayat	ilake		
Mapping	of Mod	lule Learı	ning O	outcomes ((MLO)	to the Pr	ogran	nme	Outco	omes (H	PO)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	']	PO8	PO9	PO10	PO11	PO12	
LO-1	Н				L								Н	
LO-2	H	L			L								M	
LO-3	LO-3 M L L M													
Niodule	H				L							1	H	
So	Scale: H – High M – Medium L – Low													

Module C	Code	MA	2023	Мо	dule Title	Ca	alculus								
Credits		2	.0			Le	ectures		2	.0	D //	a	• •		
GPA/NG	PA	G	PA	HOU	irs/ week	La	ab/Assig	nments	-		Pre/	Co- requ	lisites	M	IA1023
Module T	ype:	Cor	e Mod	lule/C	ompulsory	,	>		Elect	ive		Op	tional		
Learning After com LO-1: pe eng LO-2: ap LO-3: ap	Outcon apleting to rform ve gineering ply Dive ply Cau	nes (L this m ector c g appl ergenc chy's	Os) odule, liffere ication ce, Sto integra	, stude ntiatio ns, kes' a al forr	ents should on and inte nd Green' nula to sol	be ab gratio s theo ve pro	ole to: n and eva rem in pr oblems.	aluate veo oblem so	ctor a	nd so and	calar qu	antities	in vari	ous	
Module (Outline												LOs	Co	vered
Vector Ca Double in Introducti Space cur Divergence Some basis Complex	alculus itegral, a ion to ver- ves and ice theore ic applic Variabl	triple ctor c line ir em, St eations les	integr alculu utegra okes ' 1 5	al, veo s, vec l, surf theore	ctor function tor different ace integra m and Gra	ons itiatio als een's t	m and dij theorem i	ferential n a plane	opera e	ators	3		LO-	1, I	_0-2
Complex VariablesAnalytical function and Cauchy-Reimann equation.Cauchy's integral formula and applicationsTaylor and Laurent's seriesContour integrationIntroduction to conformal mapping													-3		
			Cat	egory	,		Туре			As	sessed	LOs	W	eigl	htage
	4		(~ ^	Quizz	es					All			20%	6
Assessme	nus			CA	Midte	rm Ex	aminatio	n			All			10%	6
			V	WE	End S	emest	er Exami	nation			All		,	70%	6
Names of	Lectur	ers]	Ms. S. Dr. U.	M. T. N. Jayatilake	Paden	iya, Mr.	J. A. D. N	Miyur	an D	Dencil, I	Mr. N. D). S. Na	arar	ngoda,
Mapping	of Mod	ule L	earnir	ng Ou	tcomes (N	ILO)	to the Pi	ogramm	ne Ou	tcor	nes (PO	D)			
	PO1	PO	2 I	203	PO4	PO5	PO6	PO7	PO	8	PO9	PO10	PO1	1	PO12
LO-1	М					L									L
LO-2	Н	М				L									М
LO-3	Н	L													L
Module	H	L				L									Μ
S	Scale: H – High M – Medium L – Low														

Module C	Code	MA	2033	Mo	dule Title	Li	near Alge	ebra						
Credits		2	.0			Le	ectures		2.0					
GPA/NG	PA	G	PA	Hou	irs/Week	La	ıb/Assigr	ments	-	Pre/	Co- requ	uisites	MA1	013
Module T	ype:	Cor	e Mod	ule/Co	ompulsor	7	V		Elective	e 🗖	Op	tional		
Learning After com LO-1: de LO-2: red LO-3: fin LO-4: art	Outcon pleting termine duce a n ed Eigen ticulate	nes (L this m the di natrix value the co	Os) odule, mensio using s and l oncepts	stude on of a Gauss Eigen s of lin	nts should a vector sj -Jordan re vectors of tear transf	l be ab pace, ra eductio a matr ormati	le to: ank of a 1 on, and so rix and on.	natrix an lve a sys	nd basis natem of 1	for a vec n equatic	ctor spac	e, variabl	es,	
Module C	Outline											LOs	Cover	ed
Vectors sp bases, col	oaces, si umn spa	ıbspac ıce, ro	ces, lin w spa	ear co ce ana	ombinatio l the rank	ns, spa of a m	nning sei atrix	ts, linear	indepe	ndence a	nd I	LO-1, L	.O-2, I	LO-4
Linear tra	ensforme	itions]	LO-4	
Eigen Val	n Values and Eigen Vectors of n ξ n matrices												LO-3	
Inner product spaces, diagonalization of matrices, quadratic forms, Cayley-Hamilton theorem, the matrix form of a linear transformation												LO-4		
			Cat	egory			Туре		A	Assessed	LOs	Weightage		
		·		-	Quizz	es				All			20%	
Assessme	nts		(ĊA	Midte	rm Ex	m Examination All						10%	
			V	VE	End S	emeste	er Exami	nation		All		,	70%	
Recomme	ended			1. Iı	ntroductio	n to Li	inear Alg	ebra, Gil	bert Str	ang				
Textbook	S Lootun	0.190		<u>2. L</u>	inear Alg	ebra, S	eymour l	Lipschutz	Z	Danail				
	Lectur			vis. 5.	WI. 1. IN.		iya, ivii. J	. A. D. I	viryuran	Delicit	2			
Mapping	of Mod	ule L	earnin	ig Ou	tcomes (N	ALO)	to the Pr	ogramm	ie Outc	omes (P	0)			
	PO1	PO	2 F	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO1	1 PC	012
LO-1	Н					L								L
LO-2	М					L								L
LO-3	М	 				L	ļ			 		<u> </u>		L
LO-4	Н					L							_	L
Module	H					L]	Ĺ
S	Scale: H – High M – Medium L – Low													

Module C	Code	MA	.3013	Mo	dule Title	Ap	plied Sta	atistics					
Credits		2	2.0		/XX7 1	Le	ctures		2.0)			N
GPA/NG	PA	G	PA	HO	Irs/ week	La	b/Assign	nments	-	Pro	e/Co- req	uisites	None
Module T	ype:	Cor	e Mod	lule/C	ompulsory		>		Electiv	e 🗖	0	ptional [
Learning	Outcon	nes (I	LOs)	atuda	nta abould l	ha ah	la to:						
	pieting (arform a	range	of sts	, stude	al procedure	oe ao.	ie io.	e maninu	lation	and into	rpretatio	n of data	
	erjorm a	h hat	voon t		f statistical	toata	that max	he wood	to onel	und inte	and	ii oi uata,	
LO-2: al	sunguis	<i>n</i> betv	weent	ypes c	a statistical	tests	that may	be used			and		
LO-3: de	emonstre	<i>ate</i> kn	lowled	ge of	assessing th	ie app	propriate	ness of st	atistica	l model	S.		
Module C	Outline											LOs C	overed
Discrete a	and Con	tinuc	ous Ra	ndon	Variables								
Bivariate of	distribut	tions.											
Moment g	eneratin on to M	ig fun Locti	ction									101	102
Basic proi	on to Mi perties o	L esin of Geo	maiors metric	s 2. Hvn	er geometri	c. Ex	ponentia	l and Gai	mma. a	listribut	ons	LO-1	, LO-2
Student's	Student's t-distribution.												
Fisher's d	Fisher's distribution and Chi square distribution												
Statistical	Statistical Inference												
Hvpothesi	s tests. (iions, Goodi	venira vess-of	n nmi f-fit te	sts and con	tinger	icv table	ervais jor	meun	una vari	unce	LO-2	. LO-3
Simple lin	ear regr	essio	n	J									,
Least squa	are estin	nation	i and h	ypoth	esis tests in	simp	le linear	regressio	on				
			Cat	egory			Туре			Assesse	d LOs	We	ightage
				~ A	Quizze	es All				1	2	0%	
Assessme	nts			A	Midter	Midterm Examination All				ation All			0%
			V	NЕ	End Se	meste	er Exami	nation		Al	1	7	0%
Recomme	ended			1. A	nplied Reg	ressi	on Analy	sis by Te	rrv E.	Dielmar			
Textbook	s			2. A	dvanced E	ngine	ering Ma	athematic	s by H	K. Das	S		
Names of	Lectur	ers	1	Prof. 7	F. S. G. Peir	ris, M	r. N. D.	S. Narang	goda, N	1s. R. Ja	yasunda	ra	
Mapping	of Mod	ule L	earnir	ng Ou	tcomes (M	LO) (to the Pr	ogramm	e Outo	comes (l	PO)		
	DO 1	DO		001	DO4 T	0.5	DOC	DOZ	DOO	DOO	DO10	DOI1	DO10
	POI	PO	02 F	203	PO4 I	/U5 M	PO6	PO7	PO8	P09	PO10	POIL	PO12
LU-I	M					M						_	
LO-2	H					M					_		IvI
LO-3	M												Ivi
ivioaule	IMI					п				1			IVI
S	Scale: H – High M – Medium L – Low												

Module Code	ME1032	Module Title	Mechanics (Statics &]	Dynamic	s)								
Credits	2.0		Lectures	2.0									
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	3/4	Pre/Co- re	equisites	None						
Module Type:	Core Mod	ule/Compulsory	El El	ective		Optional							
Learning Outcom	nes (LOs)	studente chevild l	a abla ta										
LO-1: calculate s	sectional pro	operties of plane	areas.										
LO-2: calculate i	internal force	es in beams.											
LO-3: <i>identify</i> sta members,	atically dete	rminate / indetern	ninate trusses, their stabi	lity and	determine fo	orces in ti	russ						
LO-4: determine	the geomet	ry of planar motio	on of particles and rigid b	oodies,									
LO-5: analyse ge	eometry of r	notion of kinema	tic elements in 2D link m	nechanisr	ns,								
LO-6: analyse th	e forces in p	particles and rigid	bodies in motion,										
LO-7: estimate es	nergy assoc	iated in particle a	nd rigid body motion,										
LO-8: analyse na	atural vibrat	ions of damped, s	ingle degree of freedom	systems	and								
LO-9: model syst	tems and so	lve basic problem	is in dynamics.										
Module Outline						LOs	Covered						
Statics Properties of plane areas, internal forces (BMD & SFD), Principle of Superposition, determination of forces in assemblies of Rigid Bodies. Dynamics													
determination of forces in assemblies of Rigid Bodies. Determination of forces in assemblies of Rigid Bodies. Dynamics Fundamentals of dynamics 1. Kinematics of particles (rectilinear and curvilinear motion, relative motion, general motion in 2D) and rigid bodies (relative motion between two points in a rigid body, velocities in 2D link mechanisms, instantaneous centre of rotation method,													
introduction i 2. Kinetics of po momentum, a Mechanical vibrat	to accelerat articles and ungular mon ions	ion) rigid bodies (forc tentum)	ce, torque, work, energy o	and powe	er, linear	LO-	6, LO-7						
3. Free vibratio	ns (undamp	ed and damped) o	of single degree of freedo	om systen	ns	I	LO-8						
Practical Work													
1. Deflection	n of an elast	ic beam				l	LO-1						
2. Modelling	g and analys	sing a dynamic sy	stem based on linear and	l universa	al vibration	I	LO-9						
Assignments	·												
1. Tutorials						LO-	1, LO-2,)s 4 - 8						
2. Take hom	LO-1	or LO-2											
	Cat	egory	Туре	Ass	essed LOs	W	eightage						
		Practica	al deflection of beams [49	%]	LO-1								
		Take ho	ome group assignment [3	%]	LO-1								
Assessments		Lab rep	ort on vibration [7%]	LC)-8, LO-9	2	20 %						
Assessments		A Viva-vo vibratio	oce performance on n experiment [3%]	LC	0-8, LO-9								
		In-class	quiz [3%]		LO-1								
	V	VE End Sei	mester Examination		All	8	30 %						

	1 ED Boor and ED Johnston "Mechanics for Engineers Statics and															
			1. F. D	 F.P. Beer and E.R. Johnston, "Mechanics for Engineers – Statics and Dynamics", McGraw-Hill Book Co. 												
			2. F.	P. Beer a	nd E.R. J	Johnston	Jr., "Me	chanics of	of Mater	ials". Mo	Graw-H	ill.				
			3. F.	Durka (I	Formerly	W Morg	an and I	D.T. Will	iams), "	Structura	l Mecha	nics",				
			L	ongman I	_td.	2	2		,,,			,				
Recomme	boba		4. Jo	hn Hann	ah & R.C	C. Stephe	ns, "Meo	chanics o	f Machi	nes": Ele	mentary	Theory				
Textbook	s		aı	nd Examp	les, 4th I	Edition, I	Edward A	Arnold (I	Publisher	s) Ltd.						
	-		5. D	avid H. N	1yszka, "	'Machine	es and M	echanisn	ns": App	lied Kin	ematic A	nalysis,				
			41 6 E	n Edition	, Prentico P Boor (e Hall	iscell Io	haston I	· "Vect	or Mache	nics for					
			0. F	ngineers"	-DYNA	AMICS.	9th Editi	on. McG	raw-Hil	Book C	ompany					
			7. R	.C. Hibbe	eler. "Eng	vineering	Mechar	nics"-DY	NAMIC	S. 12th F	Edition. F	Prentice				
			Н	all		ə <i>0</i>				~,	, -					
Names of	Lecture	ers	(Stat	ics)-Prof.	W.P.S. I	Dias Dr.	(Mrs.) D	. Nanaya	akkara,							
			(Dyn	amics)- N	Ar. M.S.	Chandra	siri	-								
Mapping	of Modu	ule Lea	le Learning Outcomes (MLO) to the Programme Outcomes (PO)													
	PO1	PO2	PO3	Outcomes (MLO) to the Programme Outcomes (PO)03PO4PO5PO6PO7PO8PO9PO10PO11PO12												
LO-1	Н															
LO-2	Н															
LO-3	Н															
LO-4	М											L				
LO-5	Н	М	L													
LO-6	М											L				
LO-7	М											L				
LO-8	Н	М	L L													
LO-9	Н	М	L L L													
Module	Н	Μ	L L L													
S	cale:	H – Hi	L L L Straight M – Medium													

Module Code	ME1812	Module Title	Basic Thermal Scien	ces									
Credits	2.0		Lectures	2.0	Pre/Co-								
GPA/NGPA	GPA	Hours/Week	Lab/Assignments	0	requisites	-							
Module Type:	Core Mod	ule/Compulsory		Elective		Optional							
Learning Outco After completing	mes (LOs) this module,	students should b	e able to:										
LO-1: describe t	he basic conc	epts of thermodyr	namics and identify asso	ociated en	ngineering pr	oblems,							
LO-2: use therm	odynamic pro	operty tables,											
LO-3: apply fund	damental law	s to solve simplifi	ed thermal system deriv	ved from	real world ap	plications,							
LO-4: <i>apply</i> basi	c concepts of	heat transfer to en	ngineering problems ar	nd									
LO-5: estimate b	asic requiren	nents related to the	ermodynamic cycles an	d their ap	plication.								
Module Outline	2					LOs Covered							
Introduction [1 Historical Devel	h] opment, therr	nodynamics conce	epts and terminology, u	nits and o	conversions	LO-1							
Basic principles [4 h]LO-1, LO-2Forms of energy and their transformations, heat and work as methods of energy transfer, the statistical nature of thermodynamics, types of systemsLO-1, LO-2Fundamental laws of thermodynamics [8 h]LO-1, LO-2													
the statistical nature of thermodynamics, types of systemsLO-1, LO-2,Fundamental laws of thermodynamics, first law with reference to principal system types, internal energy as a consequence of the first law, second law of thermodynamics, entropy as a consequence of the second lawLO-1, LO-2, LO-3													
Thermodynami Basic types of pr diagrams, revers	c processes [cocesses, proc tible and irrev	2 h] resses as transition versible processes	n of thermodynamic sta , cyclic processes	tes, prop	erty	LO-1, LO-2							
Heat Transfer [Mechanisms of h	3 h] eat transfer,	heat transfer appl	ications in engineering			LO-4							
Psychometrics [<i>Thermodynamic</i> <i>properties</i>	3 h] properties in	psychrometrics, U	Use of psychrometric C	harts esti	mate	LO-2, LO-3							
Power Cycles [4 Heat engines and indices, basic est	h] d heat pumps. timations	Idealised gas & 1	vapour power cycles an	nd perfori	nance	LO-5							
	Category		Туре	As	sessed LOs	Weightage							
		Assignment 1: E concepts	Basic thermodynamic	L	D-1, LO-4	5%							
Assessments	Assessments CA Assignment 2: Applications of fundamental laws and use of property tables LO-2, LO-3, LO5 10 %												
		Midterm test		LO	D-1, LO-2, LO-3	15 %							
	WE	End Semester E	xamination	L(L(D-1, LO-2, D-3, LO-4	70 %							

Recommended	1. 2.	Cengel, Y.A., Cimbala, J. and Turner, R.H. (2017), Thermal-Fluid Sciences, 5th Ed. McGrawHill, ISBN 978-9-814-72095 Rathakrishnan, E. (2013), Fundamentals of Engineering Thermodynamics, 2nd Ed, PHI, ISBN: 978-81-203-2790-0
Recommended Textbooks	3. 4.	Eastop, T.D. and McConkey, A. (2002), Applied Thermodynamics for Engineering Technologist, 5th Ed, Pearson Education, ISBN: 81-7808-557-7 Gordon Rogers and Yon Mayhew, Engineering Thermodynamics: Work and
		Heat Transfer, 4th Edition, Addison Wiesley, ISBN 981-235-846-3

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1	Н	Н	L		М							
LO-2	Н	L										
LO-3	Н	L	L		М	L						
LO-4	Н	L			М							
LO-5	Н	L			М	L						
Module	Н	Μ	L		Μ	L						
S	cale:	H – Hig	h	M - N	Medium		Ι	L – Low				

Module C	Code	MT	1022	022 Module Title Properties of Materials										
Credits		2	.0	Uor	mc/Wool	L	ectures		2.0	Dreck	Co more	initan	Nona	
GPA/NG	PA	G	PA	поц	15/ WEEK	L	ab/Assig1	nments	1/2	Pre/	co- requ	lisites	None	
Module T	ype:	Core	e Mod	ule/Co	ompulsor	У	>		Elective		Op	tional 🗌]	
Learning After com LO-1: re LO-2: id LO-3: as	Outcom pleting <i>ecognize</i> <i>lentify</i> the ssess the	nes (L this m the st the rela prope	Os) odule, ructure tionshi erties o	stude e of m ips ber of engi	nts shoul etals, pol ween the neering 1	d be ab lymers e struct materia	ble to: and ceranure of ma lls.	nics, terials ar	nd their p	ropertie	s, and			
Module C	Outline													
 Intr Stru Cry Me Cha Ele Intr Raa 	roductio ucture o vstal stri chanica emical p ctrical p roductio dioactiv	n to en f atom ucture l prop proper proper on to n ity and	nginee as, ator s and o verties ties of ties of anoma d nucle	ring n nic th defect. of mater mater mater terial ear pro	naterials eories, au erials ials ials s pperties	tomic b	oonding ir	ı materia	ıls					
			Cat	egory				Туре				Wei	ghtage	
Assessme	nts		0	CA	Assig Labo	gnment	s/quizzer	s [10 %] %]				20)%	
			v	VE	End S	Semest	er Exami	nation				80)%	
Recomme Textbook	ended s		1	1. W W 2. A th 3. B M 4. W	/illiam D /iley & S shby, M. eir Prope arret, C. Iaterials, /illiam F	Callis Sons, In F., Jon erties & R, Nix Prentic . Smith	ster, Mate nc. nes, D. R. & Applica , W. D., 7 ce –Hall, n, Javad H Edition	erials Sci H., Eng tions, Pe Tetelman 1973, US lashemi, McGraw	ence and ineering rgamon 1 , A. S., T SA. Ravi Pra Hill, 200	Engined Materia Press, U The Prind kash, M	ering, 5 ^{tl} ls – An I .K., 199 ciples of aterials s	¹ Edition ntroduct 1. Enginee Science	n, John tion to tring and	
Names of	Lectur	ers	N	Mr. V.	Sivahar	ı <u></u> , т	Lattion, 1	vicolaw	1111, 200	/0				
Mapping	of Mod	ule L	earnin	ig Out	comes (1	MLO)	to the Pr	ogramn	ne Outco	omes (PO	D)			
	PO1	PO	2 F	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
LO-1	H					1.55	100		1.00	/	1 310		1 0 12	
LO-2	Н	М												
LO-3	Н													
Module	H	Μ	[
S	cale:	H – F	ligh		M – N	Iedium	l	Ι	L – Low					

Module (Code	MN	1012	Mod	ule Title	Er	gineering	g in Cont	ext					
Credits		1	0			Le	etures	5 m com	1	0				
	D۸	N	GDA	Hour	s/Week		b/Assign	monte	1.	0	Pre/0	Co- requ	isites	None
GI A/NG	IA	11	UIA			La	ab/Assigi	ments	-					
Module 7	ype:	Cor	e Mod	ule/Co	npulsory	7	\checkmark		Electiv	/e		Opt	tional	
Learning After com LO-1: re LO-2: ia LO-3: ez LO-4: da Module (1. What engin 2. Econ	Outcom pleting to ecognize dentify the cplain the escribe t Dutline t is engine neering homic, ri	nes (L this m the so the basis the imp he basis he imp he basis	Os) odule, cientifi ic ingre ortance sic prot	studen c and s edients e of ecc fession its rele and re	ts should ocial con of profe pnomic, : al skills, vance to ecent) in engin	be ab ntexts ssiona risk an ethics societ	ble to: in engine lism in er ad safety i and conc y. <i>Histori</i> g. <i>Roles a</i>	ering pro ngineerin issues for cepts requ ical devel ind respo	fessio g, the en uired f	n, ngin or an nt of ties	eering n engir	decision neer in in eering ar rofession	s and dustrial nd Sri La al engin	society. unkan eer in
socie 3. Inter prob 4. Susta 5. Skill:	 Economic, risk and safety issues in engineering. Roles and responsibilities of a professional engineer in society and industry Interaction of engineering with natural and built environment; Engineering solutions for environmental problems Sustainable engineering design, learning from failures Skills of engineer in industrial environment (management, teamwork, communication) 													nental
			C	'A	Repor	t on as	ssignmen	t			A 11		30	%
Assessme	nts				End S	omost	or Exami	nation						/0
Recomme Textbook	ended s	0.995	1	. Wi Pra CF	Illiams, I actice in C Press	B., Fig a Glob Florid	ueiredo, J pal Conte da	I.,Trevely xt: Unde	yan, J. rstandi	(ed. ing t), (201 he Tec	8) Engin chnical an	nd the S	[%] ocial,
Ivanies of	Lectur					Karuna	allayake							
Mapping	of Mod	ule L	earnin	g Outo	comes (N	1LO)	to the Pr	ogramm	e Out	com	ies (PC))		
	PO1	PO	2 P	03	PO4	PO5	PO6	PO7	PO8		PO9	PO10	PO11	PO12
LO-1							L	L	L					
LO-2	L													
LO-3				_			L	L	L			L		
LO-4							L		L					
Module				L			H	L	L					
S	cale:	H – H	ligh		M - M	edium		L	L – Lov	N				

Module Code	MN	1030	Modu	le Title	Ent	trepreneu	urship Ski	ill Dev	velopmen	t			
Credits	2	.0		(XX 7 X	Leo	ctures		2.0)	19		N.T.	
GPA/NGPA	N	GPA	Hours	s/Week	La	b/Assigr	ments	-	Pre	/Co- requ	isites	None	
Module Type:	Cor	e Modu	ule/Con	npulsory	1]	Electiv	re 🔽	Op	tional Г		
Learning Outcon After completing LO-1: apply bi LO-2: recogni decision	After completing this module, students should be able to: LO-1: <i>apply</i> business and entrepreneurial knowledge and skills to career and service pursuits, and LO-2: <i>recognize</i> the significance of personal responsibility and financial literacy in making positive life decisions. Module Outline												
Module Outline													
Business Initiation [28 h] Business Idea, company name, vision and mission, establish company values, company capitalization process. Working as a company, students conduct officer elections and learn about each department's specific responsibilities Market surveys and cost-benefit analysis to determine potential products for their target market and develop initial business plan. Setting Up the Student Company [14 h] Students host Board of Directors meeting to approve the company's Business Plan, review implementation strategies and accept the company Charter, sell shares													
Materials needed Management Sales techniques of Students hold dep Begin to finalize p meeting. Students entrepreneurial p Final Board of D	for pr during artme oroduc explo ursuit. irector	oductio selling nt meet etion, a re step s. rs liqui	on are c g of thei tings to ccess ez s and le dation 1	ordered an ir product share bes xcess inve earn how t neeting an	nd the /servi at pra- ntory to app nd ap	e compar ice ctices an r, and pro oly what prove th	ny busines ad proposo epare for they have e Annual	ss plan e chan the Bo e learn Repor	n is imple ages to cu pard of D aed as a c t	mented. I urrent com irectors l ompany t	Financia npany op iquidatic to person	erations. on al	
		Cate	egory			Туре		-	Assessed	l LOs	Wei	ghtage	
Assessments		C	CA	Assignn Assignn	nent 1 nent 2	1 [15 %] 2 [15 %]			A		30	%	
		W	VE	End Ser	neste	r Exami	nation		A	11	70	%	
Recommended Textbooks		E	Bruce R. Launchin	. Barringe ng New V	r and entur	R. Duar res, Pear	ne Ireland son 2012.	l, Entre . ISBN	epreneurs 978-0-1	ship Succ 3-255552	essfully 2-4.		
Names of Lectur	Names of Lecturers Dr. V.P.T Jayawardane												
Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)													
PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12													
LO-1	<u> </u>					М			Н	Н	М		
LO-2	<u> </u>					М			ш	ш	М	M	
NIOdule	1					IVI			H	н	IVI	M	
Scale:	H – H	ligh		M – Med	lium		L	– Lov	v				

Module C	ode	MN	2010	Mod	ule Titl	e En	trepreneu	urial Lead	dershij	р					
Credits		2	2.0			Le	ctures		1.	5		~		Ŋ	
GPA/NGI	PA	G	PA	Hou	rs/ Week	La	b/Assigr	ments	3/	2	Pre/	Co- requ	usites	Non	e
Module T	ype:	Cor	e Mod	ule/Co	mpulsor	У			Electiv	ve 🗆		Op	tional	~	
Learning After comp LO-1: gain and LO-2: dev	Outcon pleting n self-av elop ski	nes (I this m waren lls in	LOs) odule, ess on terms o	studen individ	ts shoul lual skil sion ma	d be ab ls and c king an	le to: apabilitie d probler	es of beco n solving	oming ; in ent	succe	essful eneuri	entrepre al ventu	eneuria res.	leader	8
Module O	outline														
Introduction Entreprene Entreprene Types of le Leadership Influence, Motivation Leadership Leadership Strategic l	on to en eurial d eadersh p styles power, 1 and co p issues p in dive eadersh	trepre reams haller ip politio pachim for fu erse w up	eneuria s and a ages cs and g skill. ture en vorld	ethics spirati ethics s of ent ntrepre	ersnip. ons for lead reprene neurs	ership urial le	ader								
0		•	Cat	egory			Туре			Asse	essed	LOs	We	ightage	è
					Take	home a	assignme	nt [10 %]			LO-	1			
Assessme	nts		C	CA	In cla	ass quiz	zes [20 %	6]			LO-	2	5	0 %	
					Repo	rt [20 %	6]				All				
			v	VE	End	Semeste	er Exami	nation			All		5	0 %	
Recomme	ended		l I	Northou	ise, P.G rated.	. (2018) Leaders	ship: The	ory an	d Pra	ctice.	SAGE	Publica	tions,	
Names of	Lectur	ers	I	Dr. V.P	.T Jaya	wardane	e								
Mapping	of Mod	ule L	earnin	g Outo	comes (I	MLO)	to the Pr	ogramm	e Out	come	es (PC))			
	PO1	PO	2 F	03	PO4	PO5	PO6	PO7	PO8	Р	09	PO10	PO11	PO1	2
LO-1											М	М	Μ	L	
LO-2											М	М	Μ	L	
Module											Μ	Μ	Μ	L	
So	cale:	H – I	High		M – M	ledium		L	, – Lov	N					

Module Code	MN3	010	Modu	le Title	Mu	ultidiscip	linary De	esign, I	nnovatior	and Ve	nture Cre	eation		
Credits	2.	0	II	. /XX a al-	Le	ctures		1.5	Der	C.	• • •	Nana		
GPA/NGPA	GP	ΡA	Hours	s/ w eek	La	b/Assigr	nments	3/2	Pre/	Co- requ	lisites	None		
Module Type:	Core	Modul	le/Con	npulsory				Electiv	e 🗖	Op	tional 🔽	•		
Learning Outcome After completing	mes (LO this mo	Os) odule, s	tudent	s should	be ab	le to:								
LO-1: analuse a	user ne	eed criti	ically o	consider	ing so	cietal, en	vironme	ntal and	l econom	ic aspect	s,			
LO-2: <i>design</i> an perspective	d <i>devel</i> e ve,	<i>op</i> inno	ovative	e product	s, proo	cesses an	d comple	ex syste	ems with	a multidi	sciplinar	У		
LO-3: <i>use</i> state process a	LO-3: <i>use</i> state of the art digital technologies together with conventional technologies for rapid product, process and systems design and development, and													
LO-4: develop a	LO-4: <i>develop</i> a product, process, system to meet a client based multidisciplinary design.													
Module Outline	Module Outline													
Introduction to C Role of Design un User Needs Asse. Multidisciplinary Product Analysis Analysis of Proce Conventional Teo State of the Art te Social Entrepren Sustainability, G Technological ve Commercialization Assessments	reativit ader soo ssment f Design and Inv sses an hnolog chnolog eurship reen tec ntures b on strate	y and h cietal, e for user and cr novative d Innov ies for and inv hnolog based o egies for Categ	nnovat environ r cente reative e Prod vative transfo rapid novatio ies, Cl on desig pr new gory	tion umental d red desig problem luct Deve Process prmation transfor ons leaner pr gn led in technolo Report Report	and ec gn i solvi elopma Devela of ide mation roducta novati ogies on As on As tudy [ronomic i ng ent opment eas to nev n of idea ion and C ion (Glob Type ssignmer ssignmer 10 %]	trends w produc s to new Green pro- bal, Loca nt 1 [20 9 nt 2 [20 9	ts produc oducts I) 6] 6]	Assessed LO-1, I LO-1, I LO-	LOs _O-4 _O-4 2	Weiş 50	ghtage %		
		W	E	End Se	emeste	er Exami	nation		All	_	50	1%		
Recommended Textbooks		Pa	ahl, Ge	rhard, B	eitz, V	Volfgang	, Engine	ering D	esign - A	systema	tic Appr	oach		
Names of Lectur	ers	Μ	s. Jana	uni Uthay	vasank	ter								
Mapping of Moo	lule Le	arning	Outco	omes (M	LO) (to the Pr	ogramm	e Outo	comes (PO	O)				
PO1	PO2	PC	03 1	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
LO-1 L	L			L		L								
LO-2		N	1									T		
LO-3	LO-3 L													
Module L	$\begin{array}{c c c c c c c c c c c c c c c c c c c $													
Scale:	H – H	igh	·	M – Me	dium		L	2 – Low	,					

Module Code	Odule Code MN3020 Module Title Entrepreneurship Business Basics odits 3.0 Loctures 2.0												
Credits	3.0	TT	Lectures	2.0	Pre/Co-		N						
GPA/NGPA	GPA	Hours/ week	Lab/Assignments	3/1	requisites		None						
Module Type:	Core Mod	ule/Compulso	ry 🗌	Electiv	e 🔽	Optio	nal 🗖						
Learning Outcon After completing	nes (LOs) this module	e, students shou	ld be able to:										
LO-1: demonstra	ate understa	unding of funda	mentals ideas of financi	al mana	gement for entr	epren	eurs,						
LO-2: <i>apply</i> the rights and	process of s trade secre	securing entrep	reneur's intellectual pro	perty, in	cluding patents	s, trad	emarks, copy						
LO-3: <i>analyse</i> and strate	n industry a gies , and	nd identify opp	portunities for new produced	ucts/serv	ices along with	ı mark	ceting tactics						
LO-4: <i>identify</i> h	.O-4: <i>identify</i> human resource needs for an organization and acquire and maintain required people												
Module Outline													
applications; Lon Valuation of cash analysis and risk Patents, Trade S Introduction to bu trademark Marketing and N Introduction to m development and Advertising and s Demand forecasts Planning for prod	g-term fina g-term fina flows: Tim response ecrets and usiness law; Managing (arketing; C managemen ales promoting, luction faci	geterm Juancia ncial planning e value for more Copyrights [6 Patents and p Dperations [12 onsumer behave at; Pricing objection; Integrated lities. Producti	h] h] rocedure for obtaining p cocedure for obtaining p h] h] h] h] h] h] h] h] h] h]	isk mand oatents T nizationa viness eth tions Des inventor	iai statements igement; Risk i rade secrets, co l consumers; F tics signing new pro ies. Managing	ana r identij opy ri Product: oduct: produ	eat worta fication, risk ights and ction s and processes, uctivity and						
quality						-	-						
Introduction to H and selecting app handling; Transfe	uman Resourc uman Resou ropriate hu ers promotio	es [12 h] urce Managem man capital; S ons and retiren	ent; Manpower planning taffing and training peo pents	g; Job Ai ple; Rew	nalysis and des ard manageme	igning nt; G	g; Recruiting rievance						
	Cat	egory	Туре	As	sessed LOs		Weightage						
Assessments		Repo	rt on Assignment 1 [20 9	%] I	.0-1, LO-4								
Assessments	C	CA Report	rt on Assignment 2 [20 9	%] I	.O-1, LO-4		50%						
		Case	study [10 %]		LO-2								
	v	VE End S	emester Examination		All		50%						
Recommended Textbooks	I	Robert A. Baro at a Time, Edw	n. Essentials of Entrepre ard Elgar, 2018. ISBN: '	eneurshij 978 1 78	Changing the 811 590 2	Worl	d, One Idea						
Names of Lectur	ers I	Dr. V.P.T. Jaya	wardane										

Mapping of Module Learning Outcomes (MLO) to the Programme Outcomes (PO)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1				М							Н	
LO-2						Μ						
LO-3								L				
LO-4						М						
Module				Μ		Μ		L			Н	
S	cale:	H – Hig	h	M – 1	Medium		Ι	L – Low				

Module Co	ode	MN3	3042 Module Title Business Economics and Financial Accounting											
Credits		3.	0	Uou	ma/Wool	Le	ctures		3.0) Dra		miniton	Nono	
GPA/NGP	PA	GP	PA	nou	IS/ WEEK	La	b/Assigr	ments	-	Pre	/Co- reg	luisites	None	
Module Ty	ype:	Core	Modu	ule/Co	mpulsor	y 🔽		Ele	ective		Opt	ional 🗖		
Learning C After comp LO-1: <i>def</i> LO-2: <i>ide</i> LO-3: <i>app</i>	Outcon oleting t <i>fine</i> the <i>entify</i> of <i>ply</i> basi	nes (Le this mo basic 1 f the lin c know	Os) odule, nicro nks be vledge	studer and m etween on th	nts shoul acroecou econom ese acco	d be abl nomic c ny and te unting c	le to: oncepts, echnolog concepts	y and to busine	ess env	ironment	and to i	interpret r	nain	
acc	counting	g stater	nents.				•					•		
Module O	utline													
Module OutlineBusiness Economics [12 h]Financial and Cost Accounting [24 h]Economics and the economyBasic accounting conceptsElementary theory of EconomicsTrial balanceTools of economic analysisProfit & loss account, balance sheetDemand, supply and the marketCash flow statementsTheory of the firmInterpretation of accountsDifferent types of firmsCost concepts and interpretation of costTheory of supplyAllocation of overheadsCosts and productionMarginal costing, CPV analysisStock controlStock control														
			Cate	egory			Туре			Assessed	l LOs	Wei	ghtage	
					In cla	ass tests				LO	-3			
Assessmen	nts		C	ĊA	Quiz	Quizzers/in class activities					LO-2	30%		
					Repo	rts				LO	-2			
			W	/E	End S	Semeste	er Examin	nation		A	11	70)%	
Recommer Textbooks	nded		1. 2. 3. 4.	Marri 03rd d Libby editio Steng 60649 Worth Blenc Time	ot, P., E. edition, S. y, R., Lib on, Mc G el, D.N 9-219-2, hington I ling The s/Prentic	dwards, SAGE p oby, P. A raw Hil (2011), Publish I, Britton ory and c Hall.	J. R., Me publication A. & Hoo I. (ISBN Principle in C., and Practice,	ellett, H. ons. lge, F. (2 978-1-2; es of Man ness Expr Reese A. ISBN: 02	J. (200 017). I 59-225 nageria ress Pr . (2009 273632	2). Introd Financial 412-3. I Econon ess. I), Econon 2450, Put	duction t Accoun nics, ISE mics for blisher: H	to Accour ting: 09th 3N – 13: 9 Business Financial	nting: 1 978-1- :	
Names of l	Lecture	ers	Pro	of. S.V	V.S.B. D	asanaya	ıka							
Mapping o	of Mod	ule Le	arnin	g Out	comes (]	MLO) t	to the Pr	ogramm	e Out	comes (P	O)			
	PO1	PO2	2 P	03	PO4	PO5	PO6	PO7	PO8	PO9	PO10) PO11	PO12	
LO-1		M				- 50	L	L	- 00		- 010			
LO-2						L	М							
LO-3				L								М		
Module		Μ					L					Μ		
Sc	ale:	H – H	igh		M - N	ledium		L	– Lov	V				

M. I.I.	1. 1 .	M	4010	N. 1	1. 70.41	D	·						
Module (ode	MN	4010	Mod	ule Titl	e Bu	Isiness P	an Devel	lopmen	t			
Credits		2	.0	Ноц	rs/Week	Le	ctures		1.5	Pre	'Co- reau	isites	None
GPA/NG	PA	G	PA	1104		La	b/Assign	nments	3/2		eo requ	bittes	110110
Module T	ype:	Cor	e Mod	ule/Co	mpulsor	У		Elec	tive 🛛		Optiona	V	
Learning After com LO-1: <i>iden</i> LO-2: <i>pre</i> LO-3: <i>pre</i>	Outcon pleting t ntify and pare a d sent a bu	nes (L this m l explo letaile usines	Os) odule, oit bus d busings plan	studer iness c ness pl attract	nts shoul opportun an, and ively.	d be ab ities,	le to:						
Module C	Outline												
Identifyin Introducti Writing a Compone Marketing Planning j Planning j	ng Oppo on to the success onts of a Plannin for HR for Fina	ortuni e Busi ful Bu Busi ng Pro nce	ties an iness F siness ness P oductio	nd Init Plan an Plan lan [10 on Plan	iation of d its imp) h] nning	f a Bus	iness Pla	n [10 h]					
Finalizing <i>Fine-tunir</i>	g the Bu	sines: resent	s Plan ting a	[8 h] Busine	ss Plan	for inve	stors, do	nors and	other	elated in	stitutions		
			Cat	egory			Type			Assessed	LOs	Wei	phtage
			cui	egory	Crew		- jpc	[20.0/]		10505500			Sincage
Assessme	nts		(CA	Grou subm	p Assig p Assig ission a	nment 1 and prese	(written entation)		Al	1	40	%
			V	VE	End	Semeste	er Exami	nation		Al	1	60	%
Recomme	ended]	Pahl, G	erhard, I	Beitz, V	Volfgang	, Enginee	ering D	esign, A	systemat	ic Appro	ach.
Names of	Lectur	ers]	Dr. D.N	A. Muda	lige							
Mapping	of Mod	ule L	earnir	ng Out	comes (I	MLO)	to the Pr	ogramm	e Outo	comes (P	0)		
	PO1	PO	2 4	203	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
LO-1					M		M		100		1 310		1 012
LO-2										Н		Н	
LO-3										Н	Н		
Module					Μ		Μ			H	H	Η	
S	cale:	H – I	ligh		M – N	ledium		L	. – Low	,			
			Modu	ıle Title	Pro	ofessiona	l Ethics						
--	--	--	---	--	---	---	---	--	---	--	--	---	---
Module Code	MN	4900				Professional Ethics							
Credits	1	.0	Hour	s/Week	Leo	ctures		1.0	- Pre	Co- re	misites	N	Jone
GPA/NGPA	A NGPA		nour	S/ WCCK	La	Lab/Assignments		-	110/00		0- requisites		Tone
Module Type: Co		e Module/Compulsory		npulsory	✓ Elective		ctive	Optio		nal 🗖			
Learning Outcon After completing LO-1: <i>describe</i> pr LO-2: <i>identify</i> the LO-3: <i>analyse</i> eth	nes (I this m cofession code nical is	LOs) nodule, n	student thics and ics relate nd prop	ts should b d relevant ed to their ose solutio	e abl theor engin	e to: ries, neering j	professio	n and					
Module Outline													
privileges of 3. Ethical theo 4. Individual e	f an e ories ethical sibilit	ngineer decisi	r) on maki vsis: fin	ing – more	al phi	losophie	es and va	lues					
 Project fea average, ec and preferry Organizatio Social responsion Respect for Workplace Privacy, sag and legal is Case studie 	onom ed met onal et onsibi other ethico fety ar sues) s – Er	y feasil thod fo hical a lity of t profes. ul issue ud fairr nergins	pility, sh bility, sh r decision the orga sions es and ness con g ethica	hadow prie on making making – nization possible icerns, bu l issues in	isibili cing, role soluti llying the fi	ity, mari benefit o of ethica ions (su g and ha ield of et	ket price cost (B/C ul culture ch as Cu rassment ugineerin	analys) analy: and lec ivil disc at wor	is, cost sis, irre udership obedien kplace,	of capi gularitie ce and and Inte	tal and s of B/C whistle llectual	weig ' ana blow prop	hted lysis ving, verty
 Project fea average, ec and preferro Organizatio Social responsion Respect for Workplace Privacy, say and legal is Case studie 	onom ed met onal et onsibi other ethica fety ar sues) s – En	y feasil thod fo hical a lity of t profes. al issue ad fairn <u>nerging</u> Cate	bility, sh or decision the orga sions es and ness con g ethica egory	hadow priv on making making – unization possible acerns, bu l issues in	soluti soluti llying the fi	ity, mari benefit o of ethica ions (su g and ha <u>field of er</u> Type	ket price cost (B/C al culture ch as C rassment ngineerin	analys) analy. and lec ivil diso at wor	is, cost sis, irre udership obedien kplace, Assesse	of capi gularitie , ce and and Inte d LOs	tal and s of B/C whistle llectual W	weig ana blow prop eight	hted lysis ving, verty
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5 OTHER USEFUL INFORMATION

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5. OTHER USEFUL INFORMATION

5.1 GETTING HELP AND ADVICE

Students are expected to discuss any issues or problems they have regarding the academic programme with their Academic Advisors or the Level Coordinators. In addition, they can seek assistance from the subject lecturers and the Head of Department. Problems or issues common to many students may be best resolved through the Batch Representatives at the Student Liaison Committee Meetings chaired by the Dean, Faculty of Engineering. All students are encouraged to talk about any problems encountered during the stay in the Department with the relevant staff members early, before the problems become complicated and difficult to handle.

The University has a Chief Student Counsellor and a group of Student Counsellors who are available to help in matters other than those directly related to your studies. Student Counsellors who are in the Department of Civil Engineering are listed below.

5.1.1 STUDENT COUNSELLORS IN THE DEPARTMENT OF CIVIL ENGINEERING

Dr (Mrs) D. Nanayakkara	Room CE 006
Dr K. Baskaran	Room CE 128
Dr U. P. Nawagamuwa	Room CE 017
Dr (Ms). W. B. Gunawardana	Room CERC F1/B/D8

The University has a Professional Counselling Service for students having problems of a serious nature. Please seek help from the Academic Adviser, Level Coordinator, a Student Counsellor or any staff member in the Department, who would direct you to the relevant person. Any matters that remain unresolved can be discussed with the Dean, Faculty of Engineering or the Vice-Chancellor.

5.2 SAFETY IN THE DEPARTMENT

The Department of Civil Engineering is committed to provide a safe environment within the Department and is continually improving the safety standards within Laboratories and other areas. All Technical Staff have been trained in Fire Safety and First Aid, and Fire Exits are clearly marked in the building. All Laboratories are expected to practise safety precautions in handling equipment, chemicals and other hazardous materials. All students working in the laboratories are required to be aware of the safety practices needed to be followed within the laboratory. First Aid Boxes are available at each Level of the Civil Engineering Building.

5.2.1 SAFETY OFFICERS OF THE DEPARTMENT

Dr K. Baskaran	- Lecturer in-charge
Mr E. K. Zoysa	- Analytical Chemist- Environmental Eng. Laboratory
Mr H. W. Kumarasinghe	- Senior Staff Technical Officer - Hydraulic Eng. Laboratory
Mr T. P. G. D. I. Yohan	- Technical Officer – Structural Dynamics and Health Monitoring Laboratory
Mr D. M. N. L. Dissanayaka	- Tech Officer - Structural Testing Laboratory
Mr U. K. Padmaperuma	- Tech Officer - Highway Eng. Laboratory

5.3 CIVIL ENGINEERING SOCIETY

Civil Engineering Society is the main official body looking after the welfare of students in the Department of Civil Engineering.

Civil Engineering Society (CES) was inaugurated in 1986 and has been an active contributor to the Department ever since. CES is an integral part of the Civil Engineering Department, always exploring the possibilities of upgrading the students' life in the department.



Civil Engineering Society, University of Moratuwa is the main society in the Department of Civil Engineering. Up to now Civil Engineering Society has done many things for the betterment of both students and the department. One of the main purposes of the society is to enhance the image of the Department of Civil Engineering among society at large and to assist in continually improving the quality of the courses in Civil Engineering. Society assists students having particular needs to succesfully complete their studies in Civil Engineering. Besides academic activities, annually Civil Engineering Society is organizing several students events and community service projects in order to give the students an opportunity for the personality development. Civil Padura, Civil Ape Awrudu, Suhastha, Meth Mihira, Piyaman are some of the events organized by the society. By those events, capabilities of students can be identified and it gives the opportunity to promote their leadership skills and professionalism. Further, in order to keep the Department of Civil Engineering at top of the field, Civil Engineering Society organizes both Spaghetti Bridge Competition and INSEE Concrete Mix Design competitions aiming the Techno exhibition. The society is lead by the Patron (Head of the Department), Senior Treasurer and Staff Advisor from the staff and from students President, Vice President, Junior Treasurer, Vice President, Assistant Secretary and chairman of each committee. Currently, there are eight committees under the society which are Executive Committee, Internal Affairs Committee, External Affairs Committee, Canteen Committee, Panel Discussion Committee, Editors, Coordinators and Media Crew. Civil Engineering Society promotes, explores and assists in the development of new career opportunities for civil engineering graduates and also society promotes professional interest with regards to Civil Engineering among its' members. Further, society raises and mobilizes resources for the development of Civil Engineering specially at the University of Moratuwa.

5.3.1 ACTIVITIES OF CES

- CES holds an AGM annually, where the new office bearers are elected for a tenure of 12 months
- Organize industrial workshops in collaboration with professional bodies having presentations and interactive sessions with students
- Organize guest lectures by inviting key personalities from the industry
- Carrying out charity projects to encourage students serve society
- Organize fundraising activities such as Film Festivals

5.3.2 SERVICES PROVIDED BY THE CES

- Running the CES bookshop and the photocopy centre
- Running the department canteens
- Provide newspapers at final year lecture room and in common reading stand

In addition to above services and activities, CES works in close collaboration with the industry in developing the skills of students, giving career guidance and help in addition to organizing many activities that will help familiarize students with society in Sri Lanka.

5.3.3 COMPETITIONS, STUDENTS ACTIVITIES AND COMMUNITY PROJECTS

Competitions

Civil Engineering students compete in the annual Spagati Bridge Competiion organized by IESL and the Concrete Mix Design competition organized by Siam City Cement. Initially both intra university competitions are organized in the department by the Civil Engineering Society and the winners will get the opportunity to particitipate in the inter university competition of both Spaghetti Bridge Competition and Concrete Mix Design competition in National Engineering and Technology Exhibition (Techno), organized by the Institution of Engineers, Sri Lanka (IESL). As the department of Civil Engineering we have won both of these competitions in the past. In 2017, our department achieved both 1st place (13th Batch) and 4th place (16th Batch) in the Spaghetti Bridge Competition after competing with other university teams. Also, in the same year we won the 1st place (13th Batch) in Concrete Mix Design competition as well. So, in 2017, department of Civil Engineering was capable to conquor both major competition in the field of Civil Engineering. Also, students are participating in the Emerging Civil Engineer award competition which is organized by Sri Lanka Association of the Institution of Civil Engineers Student Chapter (SLAice). In 2018

five students from our department were capable to reach the finals by competing with around 10 universities and T.M.P. Malshan (15^{th} Batch) won the 2^{nd} place for his innovative project related to traffic engineering.



Spaghetti Bridge Competition 2019



INSEE Concrete Mix Design Competition 2018

Student Activities

The students are not only capable in technical activities but also in many other extracurricular activities such as creativity, teamwork, and leadership. To optimize those activities there are several activities in the Civil Engineering department for the student for their personality development. Some events such as; Civil Ape Awrudu, Civil Padura, Civil Night, Civil Cric Fiesta and welcome of a new batch are organized by the Civil Engineering Society. In addition, several community service projects are being organized by each batch while doing their academic work.





Civil Cric Fiesta 2019



Civil Night 2018



Welcome Batch 18



Civil Padura 2020



Civil Ape Awrudu 2017

Community Service Projects

As community service projects Department of Civil Engineering organizes several events with the collaboration of Civil Engineering Society. Piyaman, Suhastha, Methmihira are some of the community service projects.



Meth Mihira 2018



Piyaman 2018



Suhastha 2019

Activity list of the Department and the respective batch responsible for organizing,

•	Civil Padura	- Level 03 (Semester 6)
•	Civil Nite	- Level 04 (Semester 8)
•	Civil Cric Fiesta	- All Batches
•	Civil Ape Awrudu	- Level 02 (Semester 3)
•	Welcome of the new batch	- Level 02 (Semester 4)
•	Meth Mihira	- Level 03 (Semester 5)
•	Piyaman	- All Batches
•	Suhastha	- Level 02 (Semester 4)

5.3.4 OFFICE BEARERS OF CES IN 2018/19

Patron			
Prof. S.A.S. Kulathilaka	Room : CE 108 Ext: 2129		
Senior Treasurer			
Prof. W.K. Mampearachchi	Room : Pavement Research Ext: 2024		
Staff Advisor			
Dr. (Ms.) W.B. Gunawardana	Room : CERCF1/B/D8 Ext: 2536		
Office Bearers			
President			
Mr. S. D. Munasinghe	Contact: 0713706886		
<u>Secretary</u>			
Mr. P.T.M. Pathirana	Contact: 0776501913		
Junior Treasurer			
Mr. T.H.M.M. Kaumal	Contact: 0714629636		

Civil Engineers:

plan, design, construct, operate, and maintain facilities and systems that serve the basic needs of society. Engineering, in general, is a problem-solving profession, and Civil Engineers focus their problem-solving capabilities on making our surroundings better places to live. Civil Engineers are frequently involved in city planning and in managing the use of natural resources. They face the challenges of meeting society's needs while protecting the environment thus ensuring sustainable development. Civil Engineering is a people-serving profession that provides a great deal of pride and achievement...!

Building & Structural Engineering



Buildings and bridges, structural forms, concrete technology, construction materials, structural dynamics and health monitoring, deployable structures, structural retrofitting, computational mechanics

Hydraulic and Water Resources Engineering

Hydrology and water resources, coastal engineering, design of water supply schemes, river and canal modelling & flow analyses, pump & turbine operations, dam & spillway designs

Geotechnical Engineering



earth retaining systems, environmental geotechnics, landslide studies, Soil-structure interaction, rock mechanics, ground improvement, unsaturated soils, energy geotechnics

Construction Engineering & Management

Project Management, construction materials and methods, disaster management, building services, IT applications in construction, building performance and occupant comfort, sustainable design

Environmental Engineering

Water & wastewater treatment, environmental impact assessment, environmental sustainability & law, air & noise pollution & their control, solid & hazardous waste management



Transportation Engineering



Traffic engineering & management, pavement design, road safety, highway construction & maintenance, transport systems planning & operations, advanced computer simulations