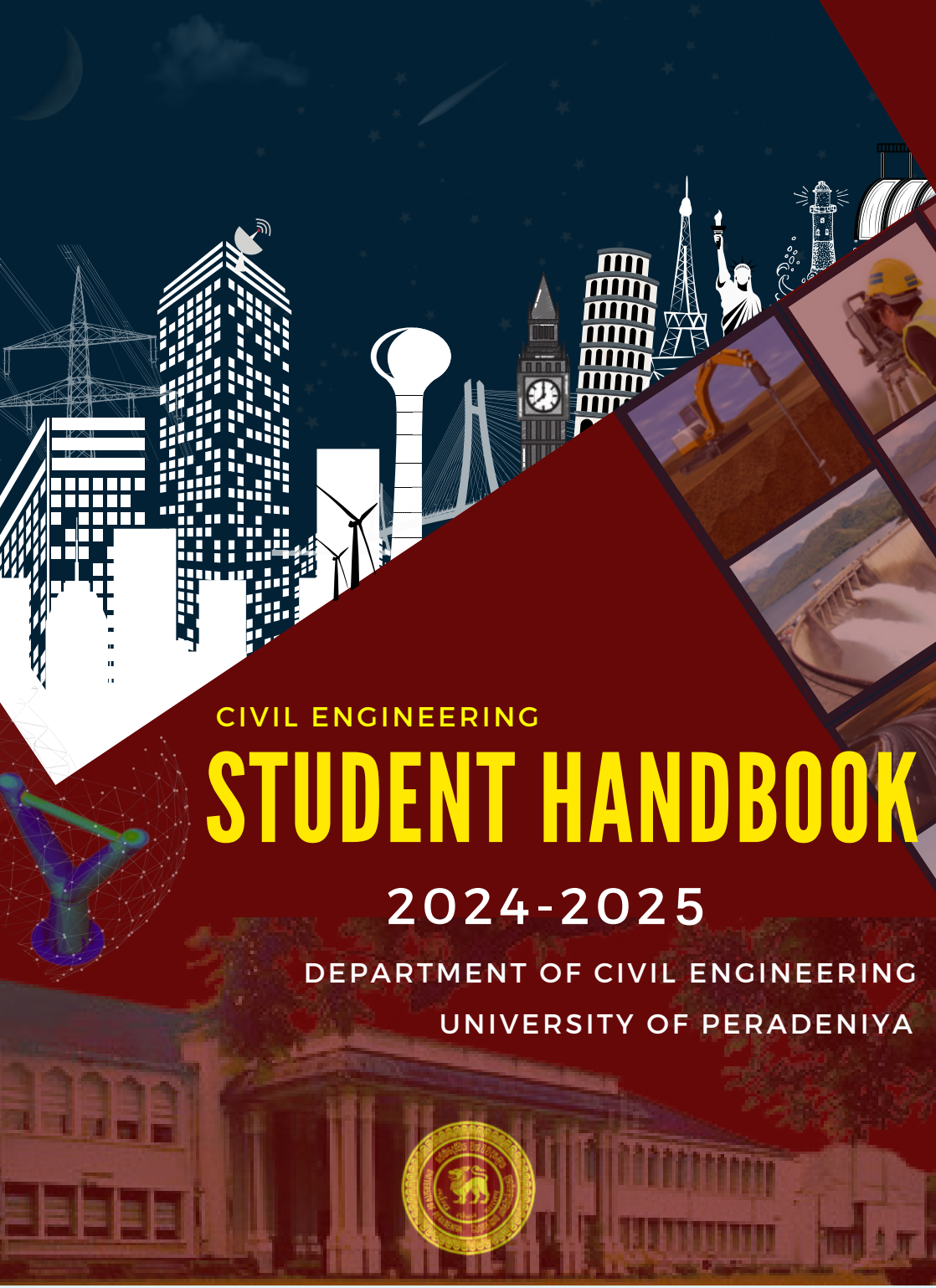

CIVIL ENGINEERING

STUDENT HANDBOOK

2024-2025

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY OF PERADENIYA

CIVIL ENGINEERING

STUDENT HANDBOOK

2024-2025

DEPARTMENT OF CIVIL ENGINEERING

FACULTY OF ENGINEERING

UNIVERSITY OF PERADENIYA

"Pioneers in Civil Engineering Education in Sri Lanka"

EDITED BY:

COMMITTEE FOR HANDBOOK PREPARATION

Prof. KK Wijesundara

Dr MMGT de Silva

| OCTOBER, 2024

Table of Contents

Table of Contents

Welcome by the Head of the Department

It is indeed with great pleasure that I warmly welcome you to the Department of Civil Engineering, Faculty of Engineering, University of Peradeniya.

As the pioneers in civil engineering education in Sri Lanka, the Department of Civil Engineering at the University of Peradeniya has made significant contributions to the nation over the past seven decades and continues to produce engineers of high calibre, fortified with engineering knowledge as well as skills in design, problem solving, research, management and communication, amongst other, whilst performing high-quality research and providing services to the nation.

The efforts of our founding fathers and their foresight and wisdom together with the core values that they have instilled are the solid foundation upon which the department has grown and continues to stand stronger. The pioneering works of the men and women of this institution over the history of its existence, be it in teaching, in research and development, or through industry interaction, have shown the way forward for others to follow. The students of the department have graduated to become leaders of the industry and in academia as well as in administration, and above all, useful and productive citizens of the country.

With an annual intake of 150 undergraduate and a nearly equal number of postgraduate students, together with an extremely well-qualified academic staff of 31 and 45 members of non-academic staff, and covering all major sub-disciplines of civil engineering, the department is one of the largestof its kind in the country, the region and beyond.

The B.Sc. Engineering degree programme in Civil Engineering discipline offered by the department is designed to provide the students with, first, a sound founding in basic sciences, mathematics and fundamentals of engineering, followed by a deeper knowledge in core areas of civil engineering as well as vital skills and aptitude in engineering design, research, project management and finances, amongst other. Several supplementary courses and activities included in the programme enable further fostering and enhancement of other important attributes to be a well-rounded graduate engineer.

The high-standards and rigour of the academic programme maintained by the department is also intended to raise the intellectual capacity of students to a higher plane as well as acquisition of necessary practical skills so as to be able to practice as a proficient civil engineer, working on complex tasks in a challenging environment, for the benefit of the society.

As the Head of the Department, I am pleased to say that we all, the staff, the students and other key stakeholders, continuously strive to be the best we can be in delivering the core parts of our mission to guide you to achieve your target of becoming a technically competent and socially responsible civil engineer.

I wish you all success and an intellectually and socially enriching experience during your stay with us.

Professor JJ Wijetunge, BScEng, PhD (Cambridge)
Head, Department of Civil Engineering
University of Peradeniya

Preface

The Civil Engineering Handbook (2024-2025) contains important information related to the Department of Civil Engineering, Faculty of Engineering, University of Peradeniya which can be useful to all its stakeholders including students, staff, industry partners as well as the general public.

The information provided in the handbook is updated on a regular basis to provide most updated information and will have an unrestricted access via the Department's official website.

The factual information provided hereunder have been extracted from the respective original documents approved by the Senate of the University of Peradeniya. Some relevant information can also be found in the Handbook of the Faculty of Engineering, University of Peradeniya. In case of any discrepancy, the original documents shall prevail over, and supersede, the information presented in this handbook.

Committee for Handbook Preparation-2024

Department of Civil Engineering, University of Peradeniya

October, 2024

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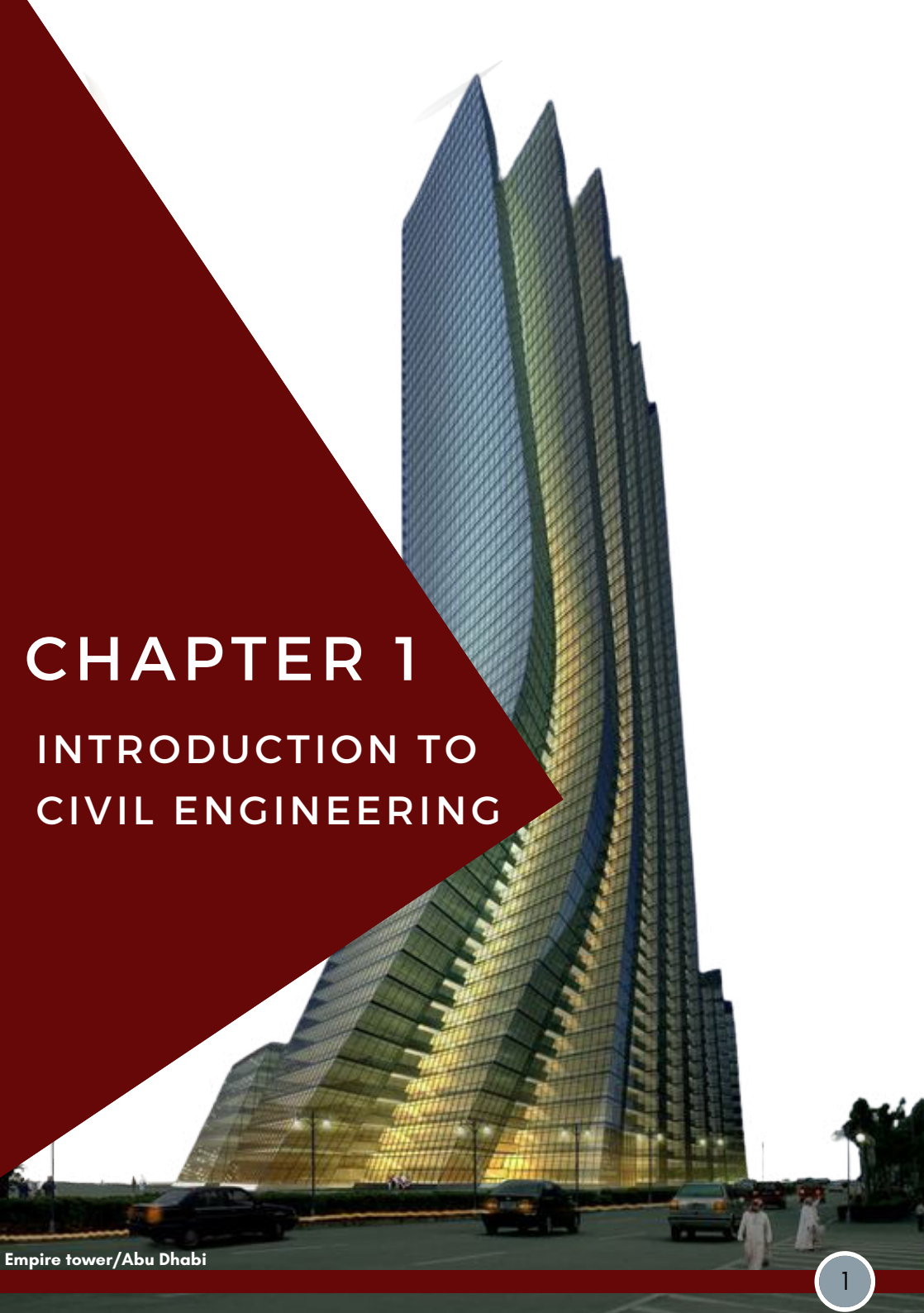
CHAPTER 1

INTRODUCTION TO CIVIL ENGINEERING



Empire tower/Abu Dhabi

1. Introduction

1.1 Brief Introduction to Civil Engineering

Civil Engineering has been an integral part of human lives since the beginning of human civilization. The earliest roots of Civil Engineering go back to a history between 4000 and 3000 BC when the Mesopotamian and Egyptian civilizations had been prospering. Although the term 'Civil Engineering' has not been used as it is, there are enough evidences for the existence of Civil Engineering in ancient times, such as in pyramids, buildings, and road networks. Apart from the still-standing massive 4500-year-old pyramids, the structures such as *Qanats* that can convey water from aquifers through underground tunnels to human settlements were built by the people of ancient West Central Asia to facilitate drinking and irrigation water needs 3000 years ago. During the following centuries, Civil Engineering had been evolving and spreading worldwide. As a result, wonders such as the Parthenon in Greece (5th century BC), the Appian Way in Rome (4th century BC), the Great Wall of China (7th century BC), Caesar's Rhine bridges (1st century BC), *Pont du Gard* in Rome (1st century AD), Hohokam irrigation system (7th century AD), Machu Picchu in Peru (15th century) and many other were erected all over the world.

Concurrently, ancestors of Sri Lanka were also experts in erecting massive and efficient infrastructure to fulfil the needs of people and to make the cities aesthetic. Buildings such as *Lovamahapaya* (2nd century BC), the palace of King *Parakramabahu* (12th Century AD), *Vatadageya* in *Medirigiriya* (7th century AD), stupas such as *Jetavanaramaya* (3rd century AD), the stone bridge across *Malvatu Oya* (between 5th and 7th centuries AD), massive reservoirs such as *Parakrama Samudraya* (12th century AD), *Kala Wewa* (5th century AD) along with sophisticated irrigation and canal systems can still be seen all over the country. Therefore, Civil Engineering has not been a strange technology to Sri Lankans as it has been practised for thousands of years.

With such a great history, Civil Engineering in modern day has become well-organized and structured with many sub-disciplines in a multi-disciplinary setting.

Modern-day Civil Engineering is a discipline which involves the analysis, design, construction, maintenance and rehabilitation of a built environment. It is not confined to a limited extent, and its contribution is essential to every component of infrastructure development. With the industrial revolution and rapid development of technology, civil engineers have now achieved marvels that people in the past could not even dream. Massive skyscrapers, giant dams, bridges with longer spans, tunnels and many more blended with modern architecture have been erected owing to the development of new analysis methods, construction technologies, data acquisition systems and continuous research accompanied with multi-disciplinary engineering. On the other hand, modern-day civil engineering has to face several challenges, such as natural disasters, climate change and the increasing complexity of human behaviour and needs.

Liebian Building/China

Therefore, we, as civil engineers, are highly responsible for making people's lives better and comfortable while preserving the environment and ensuring sustainability.

1.2 History of Civil Engineering Education in Sri Lanka

The University of Ceylon was established in 1942 in Colombo as the first university in the country. After eight years of its commencement, the Faculty of Engineering was set up in 1950 as the first of its kind. The Department of Civil Engineering was one of the three founding departments of the faculty, which was later transferred to the present site in Peradeniya with the faculty in 1964. Almost 22 years after the commencement of University of Peradeniya, the Faculty of Engineering, University of Moratuwa, was founded as the Katubedda Campus of the University of Ceylon. The Civil Engineering degree programme at University of Moratuwa was commenced in 1978. With the expansion of the Sri Lankan university network, several other universities with engineering faculties were established in the country, and thus enabling Civil Engineering higher education opportunities to a wider cohort of students in Sri Lanka. The Civil Engineering departments were established at University of Ruhuna in 1999, Univeristy of Jaffna in 2011, South Eastern University of Sri Lanka in 2012, the Open Univeristy of Sri Lanka in 1995 and University of Sri Jayawardenapura in 2016. In addition, several other state and private institutions have been established in the country to offer civil engineering higher study opportunities.

CIVIL ENGINEERING

(A few examples, many more..)

Geotechnical Engineering

Structural Engineering

Transportation Engineering

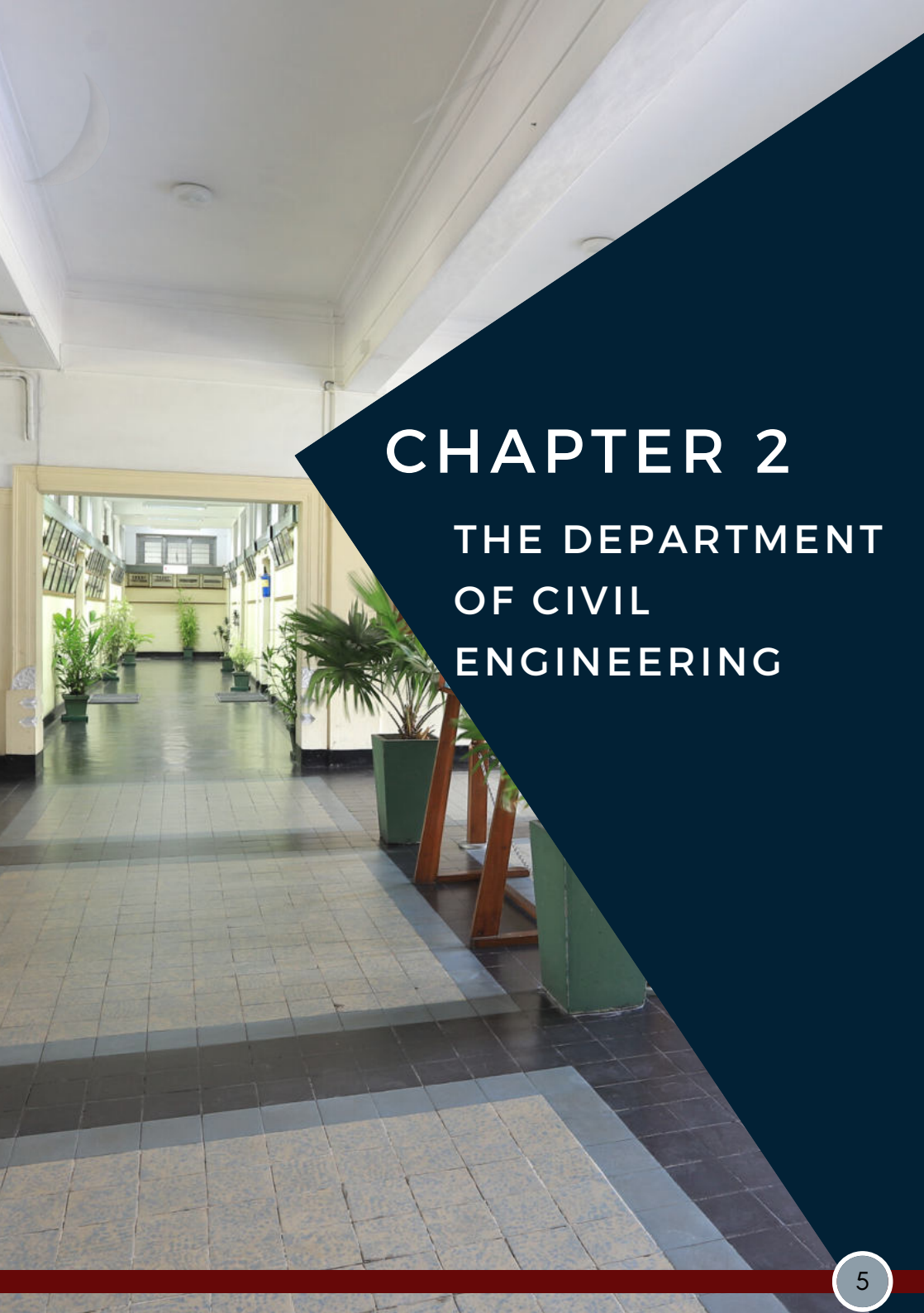
Hydraulics and Water Resources Engineering

Environmental Engineering

Wind Engineering

Earthquake Engineering

Construction Engineering



CHAPTER 2

THE DEPARTMENT OF CIVIL ENGINEERING

2. The Department of Civil Engineering

2.1 Preamble

The Department of Civil Engineering is one of the first departments established at the Faculty of Engineering, University of Peradeniya. Over the last seven decades, the Department of Civil Engineering has continued to serve the esteemed institution; University of Peradeniya as a prominent department, producing well-educated, capable and talented civil engineers to the country.

The Department of Civil Engineering currently provides engineering education to over 450 undergraduates annually, with approximately 150 in each batch. The graduands acquire the degree of the Bachelor of the Science of Engineering Honours specialising in Civil Engineering with an interdisciplinary knowledge and a professional industrial training. As a Civil Engineering undergraduate at University of Peradeniya, you will be benefitted with unmatched facilities, renowned academic staff and a convenient environment of the largest Civil Engineering department in the island.

2.2 Department's Vision and Mission

Vision

The vision of the department is to become the best Civil Engineering department in South Asia as the center of excellence in teaching, research and development, and consultancy.

Mission

To acquire, promote, develop and disseminate knowledge and application of Civil Engineering in particular to produce engineers with skills and attitudes who attain competence as professional engineers providing leadership in the national and international arena and to interact with local industry and community for sustainable development leading to enhanced quality of life while preserving national heritage.

2.3 Past Heads of the Department and Emeritus Professors

2.3.1 Heads of the Department

Prof. EOE Pereira (1950 – 1965)
Prof. HB de Silva (1966 – 1972)
Prof. A Thurairajah (1972 – 1975, 1977 – 1982)
Prof. M Amarathunga (1982 – 1986)
Prof. R Galappaththi (1986 – 1987)
Prof. Maliyasena (1987)
Prof. MP Ranaweera (1988 – 1991)
Dr. HHJ Keerthisena (1991 – 1994)
Prof. GE Amirthanathan (1995 – 1997)
Prof. KGHCN Seneviratne (1997 – 2000)
Mr H Abeyruwan (2000 – 2003)
Prof. SBS Abayakoon (2003 – 2005)
Dr APN Somaratna (2005 – 2008)
Prof. WMSB Weerakoon (2008 – 2009)
Prof. KDW Nandalal (2009 – 2012)
Dr ALM Mauroof (2012 – 2014)
Prof. PBR Dissanayake (2014 – 2017)
Dr AGHJ Edirisinghe (2017 – 2020)
Dr UI Dissanayake (2020 – 2021)
Prof. JJ Wijetunge (2021 – 2024)

2.3.2 Emeritus Professors

Six emeritus professors, Professor M. Amaratunga, Professor M. P. Ranaweera, Prof. U. de S. Jayawardana and Professor K. P. P. Pathirana, Prof. S.B.S. Abayakoon and Prof. K.D.W. Nandalal are currently attached to the department.

Professor M Amaratunga has served in the department for 27 years and he was the Head of the Department (1982 – 1986) and the Dean of the Faculty (1986 – 1990).

Professor MP Ranaweera has served in the department for 38 years and he was the Head of the Department (1988 – 1991) and the Dean of the Faculty (1988 – 1991).

Professor U.de S. Jayawardena has served in the department for 35 years.

Professor K.P.P. Pathirana has served in the department for 25 years.

Professor SBS Abayakoon served in the department for 37 years and he was the Head of the Department (2003 – 2005), Dean of the Faculty (2006 – 2008) and the Vice-Chancellor of the University (2009-2012).

Professor KDW Nandalal served in the department for 32 years and he was the Head of the Department during 2009 – 2012.

2.4 Academic and Non-academic Staff

The Department of Civil Engineering comprises a group of well qualified and professional academic staff as well as experienced non-academic staff for the smooth functioning of the high quality teaching-learning process. The academic staff includes three emeritus professors, four senior professors, four professors, twenty-eight senior lecturers, and two lecturers. Moreover, to assist the teaching-learning process, up to about 30 temporary instructors are appointed. In addition, there are 45 non-academic staff including 17 technical officers, 13 laboratory attendants, 11 supporting staff members, two masons, and two management assistants.

In addition, over 35 full-time postgraduate research students are currently performing their research in the department.

2.5 Organizational Structure of the Department

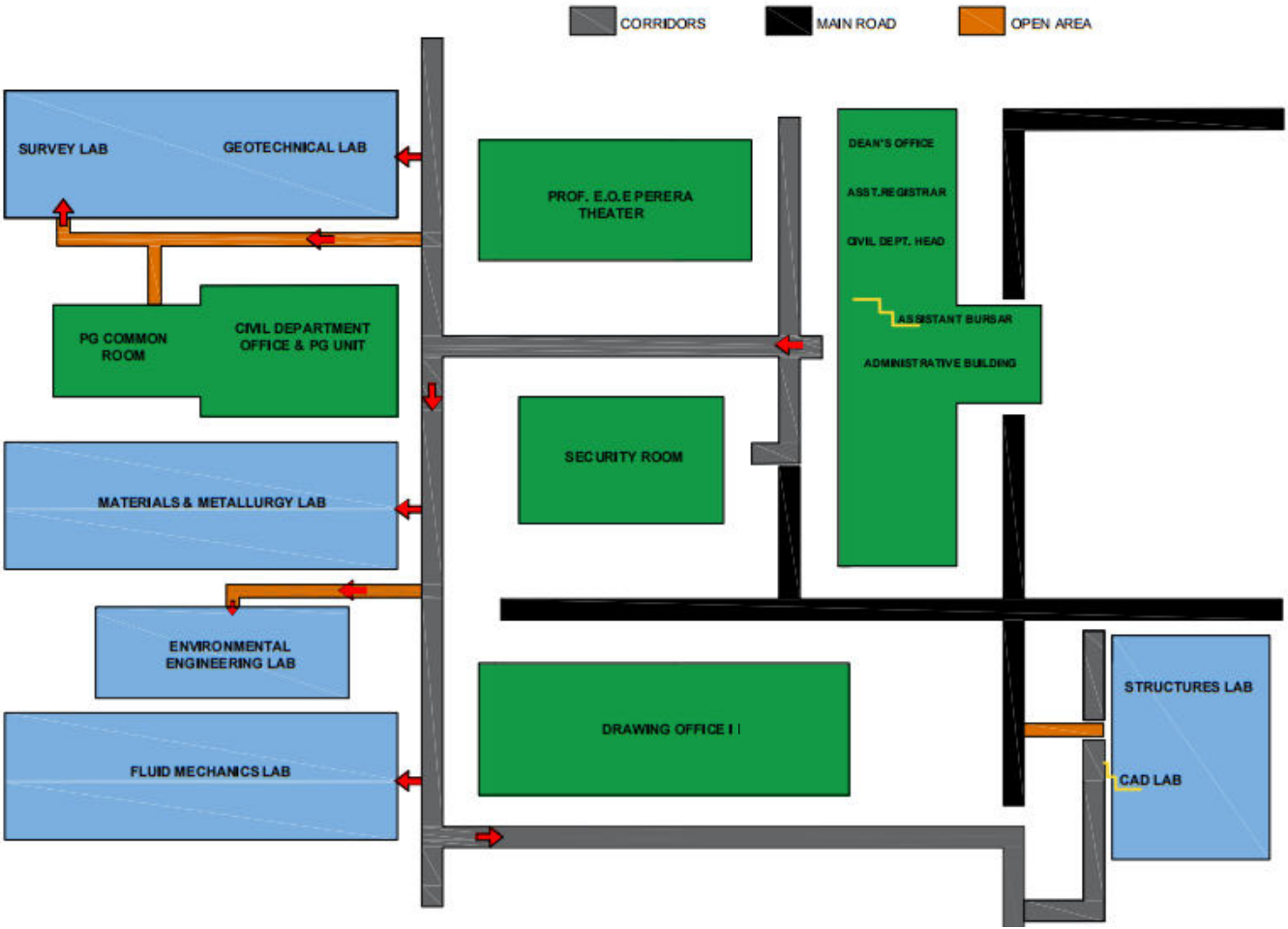
The Department of Civil Engineering comprises eight major laboratories and the Office of the Department to facilitate the teaching-learning process as well as administration in a structured manner.

- Computer-Aided Design (CAD) Laboratory
- Environmental Laboratory
- Fluid Mechanics Laboratory
- Geotechnical Laboratory
- Materials Laboratory
- Metallurgy Laboratory
- Structures Laboratory
- Surveying, Highway and Transportation Laboratory

Two other departmental entities have been established with specific objectives:

- Departmental Quality Assurance Cell (DQAC)
- Department-Industry Interaction Cell (DIIC)

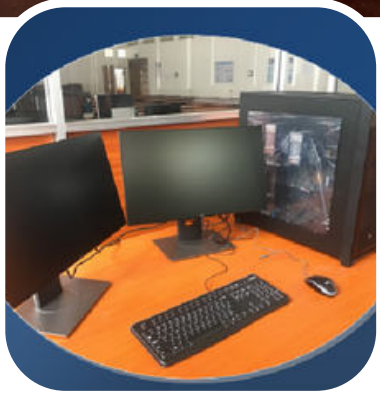
Furthermore, 24 standing committees have been appointed by the Head of the Department to effectively coordinate and perform regular departmental activities.

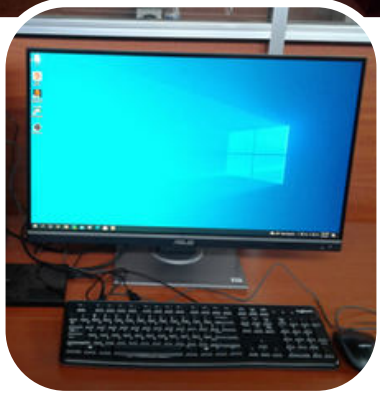


Layout of the Department Facilities

2.5.1 Computer-Aided Design (CAD) Laboratory

Computer-Aided Design (CAD) Laboratory facilitates all the sub-disciplines in Civil Engineering by providing necessary computational tools or software to analyze and design engineered systems and also developing solutions to industry requirements. The CAD laboratory is equipped with a computer network of two high-end servers, 34 desktop computers and 73 laptop computers with necessary hardware, specialized software for applications in different sub-disciplines of civil engineering: MIDAS FEA, FLAC and SAP2000 and drafting software to name a few of them. Furthermore, the CAD laboratory provides undergraduate and postgraduate students with remote access to the facilities to conduct their research studies.





CAD Laboratory

Academic Staff

There are two academic staff members attached to the CAD laboratory.

Prof. KK Wijesundara (**Lecturer-in-Charge**)

Professor

BScEng Peradeniya, MSc Pavia, PhD Pavia, AMIE SL

Expertise:
Finite element formulation and modeling of structures, Applications of finite element methods in multi-disciplinary engineering, Direct displacement-based design philosophy for seismic design of structures, Earthquake engineering and Structural dynamics

kushanw@eng.pdn.ac.lk, kalmithkush@yahoo.com +94-81-2393553

Dr NMSH Bandara

Lecturer (Probationary)

BScEng Peradeniya, PhD Melbourne

Expertise:
Guided wave-based techniques for structural health monitoring, Condition assessment of timber structures and Machine learning algorithms for health monitoring techniques

sahan@eng.pdn.ac.lk +94-81-2393553

Non-academic staff

Two non-academic staff members are attached to the CAD laboratory.

Mr AS Weerasinghe

Technical Officer

Mr ANGP Rangana

Laboratory Attendant

Full-time Postgraduate Students

Two PhD candidates on full-time basis are currently working in the laboratory.

Mr TMS Tennekoon
PhD Candidate

Research Topic:
Impact of natural hazards and their consequences on cascades of dams in Mahaweli River basin, Sri Lanka

Mr RMMP Rathnayaka
PhD Candidate

Research Topic:
Design of Geopolymer/Alkali Activated Concretes using advanced Machine Learning techniques

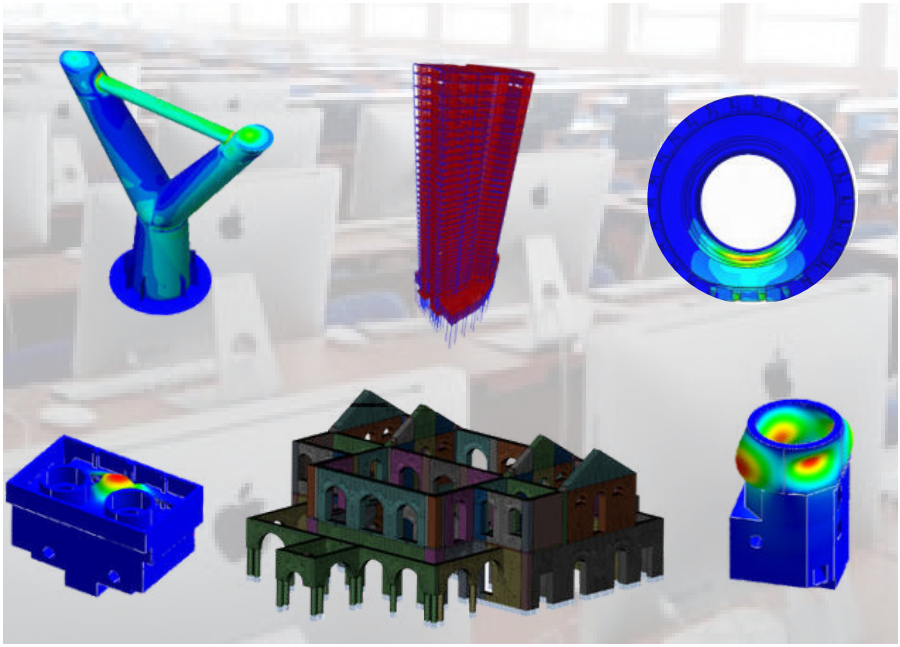
Temporary academic staff

Mr WMA Sandaruwan and Mr JAID Viduranga are currently attached to the laboratory as Temp. Instructors.

Research and Services

At present, the CAD laboratory is conducting research related to mixed finite element formulation for shear critical reinforced concrete elements, development of direct displacement-based design philosophy for seismic design of structures, extracting modal characteristics of structures from ambient vibration measurement using wavelet transformation, numerical simulation of ground motion prediction in Sri Lanka due to near- and far- field seismic events, seismic assessment of typical school buildings in Sri Lanka using fragility curves, and nonlinear dynamic analysis of structures for extreme earthquake and wind loadings.

In addition, the CAD laboratory provides specialised services such as advanced linear and nonlinear analysis of structures, structural assessment and detailed stress analysis of structural components incorporating different material models for various load combinations. Furthermore, CAD laboratory provides specialized services to provide solutions to multi-disciplinary engineering problems through numerical simulations.



2.5.2 Environmental Laboratory

Environmental Engineering is a broad area, which mainly focuses on preserving the environment by providing sustainable and innovative solutions to the existing and emerging environmental issues. The environmental engineering laboratory in the department faciltates a wide range of environmental engineering related analyses to serve this purpose. Combined also with a microbiological laboratory, the environmental engineering laboratory is endowed with modern instruments such as Atomic Absorption Spectrophotometer, Gas Chromatograph, HPLC Ion Chromatograph, HPLC Carbamate Analysis System, Organic Elemental Analyser and Total Organic Carbon Analyser. Moreover, general water and wastewater quality parameter testings such as BOD, COD, TSS, turbidity, MLVSS etc. are frequently carried out in the laboratory.

Academic Staff

There are four academic staff members including two professors and two senior lecturers attached to the Environmental Engineering laboratory.

Prof. GBB Herath

Professor

BScEng Peradeniya, MEng AIT Bangkok, PhD Tokyo

Expertise:
Water and wastewater treatment and disposal technologies, Appropriate sanitation technologies, Solid waste management, Water resources management and Water quality monitoring

gemunuh@pdn.ac.lk

+94-81-393572

Dr GMPR Weerakoon

Senior Lecturer

BScEng Peradeniya, MSc Newcastle, PhD Peradeniya, AMIE SL

Expertise:
Development of sustainable water and wastewater management technologies, Development of biological wastewater treatment methods for industrial wastewaters, Development of Innovative methodologies in environmental protection and Constructed wetlands for water quality management in tropical regions.

prabhaw@eng.pdn.ac.lk

+94-81-2393570

Dr. RMLD Rathnayake (Lecturer in-charge)

Senior Lecturer

BScEng Peradeniya, MEng Hokkaido, PhD Hokkaido, AMIE SL

Expertise:

Development of biological treatment systems for wastewater treatment, Water quality monitoring, Development and application of microsensors, Greenhouse gas emission from wastewater treatment, Solid waste treatment.

englashi@gmail.com, lashithar@eng.pdn.ac.lk 94-81-2383950

Temporary Academic Staff

Two temporary instructors are currently attached to the laboratory.

1. Ms. HGSSU Priyankara
2. Ms. WOH Pramudika

Non-academic Staff

Two technical officers, a laboratory attendant and a supporting staff member are attached to the laboratory.

Mr. KPCM Wijewardhana
Technical Officer

Mrs. MHF Zuhara
Technical Officer

Mr. WMJKM Wijesundara
Laboratory Attendant

Mr. AWADB Abeykoon
Laboratory Attendant

Mr. DRM Jayathilaka
Supporting Staff Member

Full-time Postgraduate Students

At present, two PhD candidates and one MPhil candidate on full-time basis are working in the laboratory.

Mr LMLKB Lindamulla
PhD Candidate

Research Topic:
Investigation of landfill leachate treatment using membrane bioreactor

Mr HMP Wijeyawardana
PhD Candidate

Research Topic:
Development of biochar based functional concrete material

Ms J Ketharani
MPhil Candidate

Research Topic:
Identify the fouling mechanism of Nano-filtration membrane during the filtration of groundwater with DOM and high hardness

Laboratory Classes

The practical classes conducted in the laboratory include the following:

- Membrane filtration
- BOD test

Research and Services

At present, the Environmental Engineering laboratory is engaged with research related to the development of water treatment technologies, waste and landfill monitoring, waste and wastewater characterization, and adsorbent material characterization.

In addition, the laboratory provides specialised services such as quality parameter testing for wastewaters, ground water and drinking water, soil and bio-solid sample testing, design and construction supervision, environmental impact assessment, initial environmental examination, quality assurance of bottled water industry, and water quality analysis.

2.5.3 Fluid Mechanics Laboratory

Hydraulic engineering consists of the application of fluid mechanics to water flowing through a confined or closed environment (pipe, pump) or in an open channel (river, lake, ocean) whereas water resources engineering is basically about analysis, design and providing solutions to all phases of the water cycle. A well-equipped and spacious Fluid Mechanics Laboratory was established to facilitate teaching and research in these areas. Wind tunnels, tilting flumes with fixed and movable beds, wave flumes, a towing carriage with tank (36 m^3) and facilities for testing scale models, test rigs for testing of pipes, pumps, turbines and fans are among the key equipment available for the demonstrations of principles and applications in fluid mechanics, hydraulics and hydrology to undergraduate and postgraduate students as well as for their research activities.

Academic Staff

Fluid Mechanics laboratory comprises eight academic staff members including two senior professors and two professors.

Prof. WMSB Weerakoon

Senior Professor

BScEng Peradeniya, MEng, DEng Tokyo, CEng, FIE SL, Int.PE SL

Expertise:

Hydraulic and water quality modeling, Hydrological modeling in ungauged basins, Computational fluid dynamics, River flow computations, Mini hydropower development

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Prof. JJ Wijetunge

Professor

BScEng Moratuwa, PhD Cambridge, CEng, MIE SL

Expertise:

Coastal engineering and coastal zone management, Wave and harbour processes, Wave-structure interaction, Tsunami and storm surge hydrodynamics, Coastal hazard analysis and assessment, Coastal sediment transport and morphological evolution. Wave-current boundary layers, Flow and sediment dynamics ... ...ers and channels

jjw@eng.pdn.ac.lk

+94-81-2393561

Prof. KGN Nanayakkara

Professor

BScEng *Peradeniya*, PhD *NUS*

Expertise:

Electrochemical disinfection, oxidation and reduction, Advanced oxidation processes, Development and optimization of materials for pollution control, Materials behaviour in marine and corrosive environments.

nadeen@eng.pdn.ac.lk

+94-81-2393574

Dr WCTK Gunawardana

Senior Lecturer

BScEng Peradeniya, PG Diploma Peradeniya, PhD QUT

Expertise:

Pollutant sorption by natural materials and modification of adsorbents, Pre-filter media development for excess pollutant loads, Rainwater harvesting and water quality assessment, Stormwater pollution and best management practices

chandimag@pdn.ac.lk

+94-81-2393569

Dr NGPB Neluwala

Senior Lecturer

BScEng *Peradeniya*, MEng *Tokyo*, PhD *Tokyo*

Expertise:
Flood prediction and mitigation, Climate change, Weather prediction, Dam safety, Water distribution systems

pandukaneluwala@eng.pdn.ac.lk

+94-77-662048

Dr MMGT De Silva

Senior Lecturer

BScEng Peradeniya, MPhil Peradeniya, PhD Tokyo, AMIE SL

Expertise:
Climate change analysis, Hydrological and hydro-dynamic modeling and analyses, Socio-hydrology, Flood modeling and risk management

gouri@eng.pdn.ac.lk

+94-81-393560

Mr DD Dias (Lecturer-in-Charge)

Lecturer

BScEng Peradeniya, MEng Hokkaido

Expertise:
Coastal morphology and sediment transport, River bank protection and rehabilitation, Renewable energy, Flood modelling

daham@eng.pdn.ac.lk

+94-81-2393575

Temporary Academic Staff

Three temporary instructors are currently serving in the laboratory.

1. Ms. EMYC Ekanayake
2. Ms. SMSN Sumanasekera

Non-academic Staff

Three technical officers, two laboratory attendants and a supporting staff member are presently attached to the laboratory.

Mr NASCB Ekanayake

Technical Officer

Mrs DMAD Dissanayake

Technical Officer

Mr KRN Abeysinghe

Technical Officer

Mr AMPGS Ekanayake

Laboratory Attendant

Mr PK Warshamana

Laboratory Attendant

Mr RGPK Hettimulla

Supporting Staff Member

Full-time Postgraduate Students

A PhD candidate and an MScEng candidate on full-time basis are currently attached to the laboratory.

Ms PDPO Peramuna
PhD Candidate

Research Topic:
Numerical simulation of cascade dam breach floods due to natural hazards in Mahaweli river basin, Sri Lanka

Ms PLLN Perera
MScEng Candidate

Research Topic:
Forecasting compound flooding in Kelani river basin

Laboratory Classes

The practical classes conducted in the laboratory include the following:

- Hydraulic machines
- Flow in pipe systems
- Aerodynamic forces on buildings
- Ground water flow
- Flow in open channels

Research and Services

The Fluid Mechanics laboratory is currently conducting research related to a wide scope including all phases of the water cycle: Weather and climate analysis, flow and sediment dynamics in rivers and channels, system dynamics in water resources management, reservoir water quality modeling, flood modeling, application of CFD and othercomputing techniques in water management,sediment transport with non-uniform sediments, catchment erosion, performance of berm and reef breakwaters, dam safety and emergency action plan, water and wastewater treatment, material development for advance water treatment processes, and water

quality and water safety, coastal engineering and coastal zone management, wave and harbour processes, wave-structure interaction, tsunami and storm surge hydrodynamic,coastal hazard analysis and assessment, coastal sediment transport and morphological evolution.

In addition, the laboratory provides specialised services to the industry such as testing of pumps, calibration of instruments such as current meters, aerodynamic model tests for buildings and ships, discharge measurements in canals, streams and rivers and yield tests in tube wells. Moreover, consultancy services for water resources projects, water resources systems management and designs, and feasibility studies and designs of hydro-power, irrigation, water supply systems, and harbours are also some important services provided by the laboratory.

2.5.4 Geotechnical Laboratory

Geotechnical Engineering primarily involves invesigation of engineering properties of earth materials for the analysis and design of engineered geosystems. The Geotechnical Laboratory was established to facilitate teaching and research in this area. The laboratory is equipped with facilities to carry out field and laboratory tests in the fields of geotechnical engineering and engineering geology such as Seismic Refraction Test, Resistivity Test, Classification Tests, Triaxial Tests, Direct Shear Test, Consolidation Test, Compaction Test, CBR test, Permeability Test, Rock Shear Test, LAAV Test, Slake Durability Test, Soundness Test and Determination of Shear Wave Velocity.

Academic Staff

Five academic staff members are attached to the Geotechnical Laboratory.

Dr LC Kurukulasuriya

Senior Lecturer

BScEng *Moratuwa*, MEng, PhD *Saitama*, CEng, MIE *SL*

Expertise:
Shear strength anisotropy of soils, DEM simulation of granular media, Use of geosynthetics in ground improvement

chank@pdn.ac.lk

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Dr DdeS Udakara

Senior Lecturer

BScEng Peradeniya, MEng AIT Bangkok, PhD Hong Kong

Expertise:
Laboratory and field testing in geotechnical engineering

deepthiu@pdn.ac.lk

+94-81-2393518

Dr MCM Nasvi (Lecturer in-Charge)

Senior Lecturer

BScEng Peradeniya, PhD Monash, MIE SL

Expertise:
Flow and mechanical behaviour of well cement, Geopolymers for well cementing applications, Alkali activated geopolymer concrete, Geopolymers as soil stabilizers, Mechanical method of ground improvement, Adaptability of Eurocode 7 for geotechnical design

cnasvimcm@eng.pdn.ac.lk

+94-81-2393516

Dr AMRG Athapaththu

Senior Lecturer

BScEng *Peradeniya*, MPhil *Peradeniya*, DEng *Hiroshima*, AMIE *SL*

Expertise:
Ground improvement techniques, Engineering behaviour of peat, Slope stability and erosion control on vegetated slopes, Development of prediction models using ANN, Engineering geology and geological properties of residual soils, rocks, Foundation engineering

rasika@eng.pdn.ac.lk

+94-812393520

Dr SK Navaratnarajah

Senior Lecturer

BScEng Peradeniya, MSc *Oklahoma*, PhD *Wollongong*, PE *California*

Expertise:
Performance enhancement of ballasted rail track, Artificial inclusions in Transport Geotechnics, Numerical simulation of granular materials (FEM & DEM), Permanence improvement of highway pavements, Ground improvement techniques, Artificial Neural Network (ANN) models for Civil Engineering Problems

Email: navask@eng.pdn.ac.lk

+94-81-2393519

Temporary Academic Staff

Four temporary instructors are attached to the laboratory at present.

1. Ms. JMGM Jayasinghe
2. Mr. BMST Basnayake
3. Ms. IPTH Iddamalgoda
4. Ms. HGNR Jayathissa

Non-academic Staff

Two technical officers, two laboratory attendants and two supporting staff members are serving in the laboratory.

Mr AGDL Wijeratne
Technical Officer

Ms NWGRV Hathurusinghe
Technical Officer

Mr DT Bandara
Laboratory Attendant

Mr PGI Lal Bandara
Laboratory Attendant

Mr AK Nanayakkara
Supporting Staff Member

Mr BG Jayatissa
Supporting Staff Member

Full-time Postgraduate Students

Currently, three PhD candidates, and three MScEng candidates on full-time basis are working in the laboratory.

Ms S Venuja
PhD Candidate

Research Topic:
Enhancing the performance of ballasted rail tracks using geosynthetic inclusions

Ms JANN Jayakody
PhD Candidate

Research Topic:
Improving the accuracy of degradation prediction for road infrastructure in Sri Lanka incorporating cross assets

Ms MMALN Maheepala
PhD Candidate

Research Topic:
Performance of geopolymer based binders in improving the expansive subgrades in road construction

Ms WAGTN Gunawardhana

MScEng Candidate

Research Topic:
Colloid mobilization and colloid-facilitated transport of heavy metals: a geo-environmental insight to the ckdu problem in Sri Lanka

Mr AMSN Abeysinghe

MScEng Candidate

Research Topic:
Characterization and development of an optimized stabilization technique for expansive soils in the central province of Sri Lanka

Ms J Sangeetha

MScEng Candidate

Research Topic:
Feasibility of using blended fly ash, rice husk ash, and lime treated marginal soil for road construction in Sri Lanka

Laboratory Classes

The practical classes conducted in the laboratory includes the following:

- Mechanical Analysis
- Permeability Test
- CBR Test
- Atterberg Limits
- 1D consolidation Test
- Site Investigation
- Direct Shear Test
- Compaction test
- Triaxial Test

Research and Services

Currently, the research related to the soil improvement chemical stabilization, alkali activated Geopolymers as borehole well cement, mechanical integrity of well cement, mechanical method of ground improvement, feasibility of using pozzolanic materials (fly ash, silica fume, etc.) for geotechncial applications, geotechnical characteristics and modelling of municipal solid waste dump sites, shear strength characteristics and degradation of ballast in railroads, use of geomats for reinforcing earth, soil-gas diffusivity measurements and modeling in differently-characterized soils, diffusivity-based characterization of porous media for earth and space-based applications, and modeling multiphase transport of multicomponent gases in heterogeneous porous media are carried out in the Geotechnical Laboratory.
In addition, the laboratory provides specialised services to the industry such as site investigation and feasibility studies, design of earth structures, foundations and special foundations, slope stabilisation, ground improvement techniques, instrumentation and monitoring, model testing, computer aided design and analysis, evaluation of proposals, and providing technical assistance to national projects.

2.5.5 Materials Laboratory

Materials Engineering is the study and analysis of engineering properties of various materials. The Materials Laboratory in the department is resourced with numerous facilities for investigation of physical, mechanical and durability characteristics of diverse types of engineering materials such as cementitious products, concrete, metals, timber, polymers, ceramics, and asphalt. The laboratory is equipped with a universal testing machine, a torsion machine, a compression testing machine, and the apparatus for strain measurements, rebound hammer test, photo-elasticity, ultrasonic tests, hardness and permeability tests, and aggregate tests.

Academic Staff

Five staff members are attached to the Materials laboratory including one professor.

Prof. HD Yapa

Professor

BScEng *Moratuwa*, PhD *Cambridge*, MIE *SL*

Expertise:
Shear behaviour of concrete structures, Structural retrofitting, Non-linear simulation of concrete structures, Temperature modelling of concrete, Time-dependent behaviour of concrete, Non-structural cracking of concrete.

hdy@pdn.ac.lk

+94-81-393544

Dr KRB Herath

Senior Lecturer

BScEng *Peradeniya*, MSc *Illinois*, PhD *California*

Expertise:
Engineering mechanics and materials

krbherath@eng.pdn.ac.lk

+94-81-393543

Dr PBG Dissanayake

Senior Lecturer

BScEng Peradeniya, PhD Hong Kong, MIEAust, Member PMI, AMIE SL

Expertise:
Construction management, Construction planning, Application of earned value management

pujitha@eng.pdn.ac.lk

+94-81-2393541

Dr HADS Buddika (Lecturer-in-Charge)

Senior Lecturer

BScEng Peradeniya, MEng TIT, PhD TIT

Expertise:
Earthquake-resistant design and analysis of structures, Precast/prestressed structural systems, Self-centering structures, Seismic pounding of structures, and Structural fire Engineering

samithbuddika@eng.pdn.ac.lk

+94-77-2171984

Dr KC Chandrasiri

Senior Lecturer

BScEng *Peradeniya*, MSc *New York*, PhD *New York*

Expertise:Chemistry and microstructure of concrete (cement hydration, morphology and phase changes), Nano-technology and application in concrete (nano-silica, nano-clay and nano-limestone), Numerical modeling of chemical processes/reaction kinetics of cementitious material, Sustainable concrete materials (uses of slag, fly ash, silica fume, recycled aggregate, geopolymer, etc.), Mechanical, durability and rheological performance of concrete, Synthesize and/or formulate low CO2 footprint concrete material, Chemical admixtures for concrete

cchandrasiri@pdn.ac.lk

+94-81-239xxx

Temporary Academic Staff

At present, four temporary instructors are attached to the laboratory.

1. Mr. SAS Madushan
2. Mr. DMRP Gunatilleke
3. Ms. MMF Fazra
4. Mr. KDN Karunarathne

Non-academic Staff

Eight non-academic staff members are attached to the Materials laboratory including two technical officers, a mason, two laboratory attendants and four supporting staff members.

Mr AHE Parakkrama
Technical Officer

Mr ARMCJK Ratnayake
Technical Officer

Mr AG Jayaratne
Mason

Mr SMUK Karunarathna
Laboratory Attendant

Mr HMK Bandara
Supporting Staff Member

Mr EGM Munaweera
Supporting Staff Member

Mr MHMWK Medagoda
Supporting Staff Member

Full-time Postgraduate Students

Two PhD candidates, one MPhil candidate and one MScEng candidate on full-time basis are working in the laboratory.

Ms HC Egodagamage
PhD Candidate

Research Topic:
Aerated alkali activated slag in prefabricated modular construction

Mr SMKCSB Egodawela
PhD Candidate

Research Topic:
High resolution image processing for structural defect identification and quantification

Mr DGIS Deegoda
MPhil Candidate

Research Topic:
Investigation into Warping of Chrysotile Fiber Cement Thin Sheets

Mr SAP Madusanka
MScEng Candidate

Research Topic:
Development of heat of hydration profiles for high strength concrete mixes

Laboratory Classes

The practical classes conducted in the laboratory include:

- Behavior of structural elements
- Analogy based stress analysis
- Reinforced concrete beam experiment

Research and Services

The materials laboratory is currently engaged with research related to Engineering mechanics and materials, shear behaviour of concrete structures, structural retrofitting, non-linear simulation of concrete structures, temperature modelling of concrete, time-dependent behaviour of concrete, non-structural cracking of concrete, earthquake-resistant design and analysis of structures, precast/prestressed structural systems, self-centering structures, seismic pounding of structures, and structural fire Engineering.

In addition, the Materials laboratory provides specialized services such as appraisal of existing structures (Stress analysis of Stupas such as *Jetavanaya*, *Abhayagiriya*, *Tissamaharamaya* and *Mirisawetiya*, monitoring movements of national monuments etc.), consultancy work relating to engineering materials, stress analysis of structures and components incorporating different materials models, and concrete mix design.

2.5.6 Metallurgy Laboratory

Metallurgy Engineering is a domain of Materials Engineering which specifically deals with the study and analysis of metals. Metallurgy Laboratory which is housed within the same building of Materials Laboratory comprises facilities for investigating the impact and hardness, microscopic analysis using metallurgical microscopes and the atomic absorption spectrometer, x-ray views for investigating metals and heat treatments of metals.

Academic Staff

Metallurgy laboratory currently includes one academic staff member.

Dr SR Herath (Lecturer-in-Charge)

Senior Lecturer

BScEng Peradeniya, MEng Nagoya, PhD California

Expertise:
Design of customized bone implants, Mechanics of nanostructures

shobhaherath@eng.pdn.ac.lk

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Temporary Academic Staff

Ms. PMTN Edirisinghe is attached to the laboratory as a temporary instructor.

Non-academic Staff

Three non-academic staff members are attached to Metallurgy Laboratory including a technical officer, a laboratory attendant and a supporting staff member.

Mr JRC Sampath
Technical Officer

Mr DAA Dissanayake
Laboratory Attendant

Mr RUSK Leelarathne
Supporting Staff Member

Laboratory Classes

Heat treatment of steel is conducted in the laboratory.

Research and Services

Chemistry and microstructure of concrete, design of customized bone implants, mechanics of nanostructures, nano-technology and application in concrete, numerical modeling of chemical processes/reaction kinetics of cementitious material, use of sustainable concrete materials such as slag, fly ash, silica fume, recycled aggregate, geopolymer, etc., performance of concrete, synthesize and formulate low CO2 footprint concrete material, and chemical admixtures for concrete are some research areas covered by the metallurgy laboratory.

The Metallurgy laboratory provides specialised services such as chemical analysis using Atomic Absorption Spectrometer, coating thickness measurements, X - Ray Analysis, microscopical analysis of material, case hardening of steel and heat treatment.

2.5.7 Structures Laboratory

Structural Engineering is a branch of civil engineering which deals with analysis, design, retrofitting and construction of buildings, bridges and other structures. The Structures Laboratory is dedicated to perform such tasks at the Department of Civil Engineering. It is equipped with a strong floor of 6 m x 12 m with reaction frames supporting 500 kN and 250 kN static hydraulic jacks capable of testing medium-scale precast products such as Hume pipes, Manhole covers, Steel gratings, etc. for relevant SLS, BS and other similar standards. In addition, the laboratory possesses a pre-stressing bed with pre-stressing jacks, static and dynamic data loggers, load cells, displacement transducers, strain gauges, accelerometers, ground penetration radar unit, rebound hammer, ultrasonic pulse velocity tester, concrete core cutter, half-cell potential meter, cover meter, and non-destructive hardness tester. The laboratory can also provide onsite structural testing facilities to measure deflections, strains, accelerations with online monitoring and data logging facilities for both static and dynamic testing.

Academic Staff

There are four academic staff members attached to the Structures Laboratory including a professor.

Prof. CS Bandara

Professor

BScEng Peradeniya, MSc Peradeniya, PhD Peradeniya, CEng, MIE SL

Expertise:
Metal fatigue, damage assessment of structures, structural health monitoring, blast effects on structures, disaster resilience of structures and sustainability aspects of structures

csbandara@eng.pdn.ac.lk

+94-81-2393583

Dr UI Dissanayake

Senior Lecturer

BScEng Peradeniya, PhD Sheffield, CEng, MIE SL, MSSE SL

Expertise:
Steel and Steel-Composite Structures, Cost effective structural systems

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deaneng@pdn.ac.lk

+94-81-2393300

Dr AJ Dammika

Senior Lecturer

BScEng Peradeniya, MEng AIT, PhD Saitama, AMIE SL

Expertise:
Structural Health Monitoring, Structural Dynamics, Bridge Engineering

dammikaaj@eng.pdn.ac.lk

+94- 81-393549

Dr JASC Jayasinghe (Lecturer-in-Charge)

Senior Lecturer

BScEng Peradeniya, MEng AIT, PhD Tokyo, AMIE SL

Expertise:
Structural dynamics, Large scale numerical simulation, Automated model construction

supunj@eng.pdn.ac.lk

+94-81-39XXX

Temporary Academic Staff

Three temporary instructors are now attached to the laboratory.

1. Mr UGK Prabodya
2. Mr Anjana Indunil
3. Mr. DPNAP Gunadasa

Non-academic Staff

At present, two technical officers, one mason, and two laboratory attendants are attached to the laboratory.

Mr CW Jayawardhana
Technical Officer

Mr BJBC Perera
Technical Officer

Mr UP Wijewardena
Mason

Mr UP Wijewardena
Laboratory Attendant

Mr GCPS Upulsisri
Laboratory Attendant

Full-time Postgraduate Students

Three PhD candidates, one MPhil candidate and two MScEng candidates on full-time basis are currently attached to the laboratory.

Mr HGS Mayuranga
PhD Candidate

Research Topic:
Application of rubber inclusions to improve the performance of railway tracks for faster and heavier trains

Ms SU Sathya
PhD Candidate

Research Topic:
Optimum data collection for structural integrity management of railway infrastructure

Ms T Thevega
PhD Candidate

Research Topic:
Novel uses of glass recycling technology for sustainable civil engineering applications

Ms WMAD Wijethunge

MPhil Candidate & Departmental Temporary Research Assistant

Research Topic:
Numerical and experimental investigation on lateral distortional buckling in steel concrete composite beams

Mr LN Dissanayake

MScEng Candidate

Research Topic:
Strengthening university-enterprise collaboration for resilient communities in Asia

Laboratory Classes

The practical classes conducted in the laboratory include:

- Bending of beams
- Instrumentation

Research and Services

At present, the Structural laboratory is facilitating research related to the structural health monitoring, structural failures, stress analysis, fatigue of metals, earthquake engineering, blast resistant structures, ferro-cement, ground penetration radar, corrosion of steel structures, and new teaching tools for structural design and analysis.

In addition, the laboratory provides specialized services to the industry such as testing of Hume pipes, electrical poles, man-hole covers, wall panels, and pre-cast beams, design of steel, concrete and composite structures, non-destructive testing of steel and concrete structures, rehabilitation proposals and strengthening schemes for damaged or distressed structures, testing of concrete in existing structures, detecting underground structures, rock and soil layers, voids etc., and vibration monitoring.

2.5.8 Surveying, Highway and Transportation Laboratory

Highway and Transportation Engineering is a branch of Civil Engineering which deals with planning, designing, construction and maintenance of highways and transportation systems. The well-equipped Surveying, Highway and Transportation Engineering Laboratory facilitates this purpose. Total Stations, theodolites, levels and electronic distance meters and GPS/GIS are available for comprehensive land surveying and contouring. Furthermore, Benkelman beam, variety of surface roughness/ resistance testing equipment and weight bridges for highway pavement evaluations and all laboratory testing equipment related to bitumen and asphalt testing (Marshall test, penetration elongation, softening point, flash and fire point) are also available in this laboratory..

Academic Staff

Surveying, Highway and Transportation Engineering laboratory comprises five academic staff members..

Dr AGHJ Edirisinghe

Senior Lecturer

BScEng Peradeniya, MEng, PhD Ehime

Expertise:
Natural disasters, Road traffic accidents

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Dr IMS Sathyaprasad

Senior Lecturer

BScEng Moratuwa, MEng AIT Bangkok, DEng Yokohama

Expertise:
Transportation and traffic planning in small cities, urban environmental issues, two-lane highways, modeling school transport, low-cost methods in traffic estimation

imss@eng.pdn.ac.lk

+94-81-2393535

Dr HK Nandalal

Senior Lecturer

BScEng Peradeniya, MSc Wageningen, PhD Peradeniya, CEng, MIE SL

Expertise:
Hydrology, GIS and RS application in hydrology, Flood modeling, Flood hazard, Vulnerability and risk assessment

hemalin@eng.pdn.ac.lk

+94-81-393532

Dr WMVSK Wickramasinghe (Lecturer-in-Charge)

Senior Lecturer

BScEng Peradeniya, MEng, PhD Hokkaido

Expertise:
Travel behavior analysis, transport safety studies,
Public transportation system planning and route network efficiency analysis, Multi-criteria decision support system modeling for traffic issues, Highway asset management, Disaster risk evaluation and mitigation measures

vskw@eng.pdn.ac.lk +94-81-2393517

Dr WRSS Dharmarathna

Senior Lecturer

BScEng Peradeniya, MPhil Peradeniya, PhD Tokyo, AMIE SL

Expertise:
Transportation planning, Discrete choice modeling (mode choice and route choice), Behavior in networks, Traffic engineering

samal@eng.pdn.ac.lk +94-81-2393531

Temporary Academic Staff

Three temporary instructors are currently serving in the laboratory.

1. Mr. TDB Koralegedara
2. Mr. DYKS Illesinghe
3. Mr. AGYM Kumara

Non-academic Staff

Three technical officers, one laboratory attendant and three supporting staff members are attached to the laboratory.

Mr M Piyal Gamini

Snr. Staff Technical Officer

Mr PB Rajakaruna

Technical Officer

Mr RMSB Rathnayake

Technical Officer

Mr PM Daminda

Laboratory Attendant

Mr WHMSB Herath

Supporting Staff Member

Mr RMNI Rathnayake

Supporting Staff Member

Mr RMH Rupassara

Supporting Staff Member

Laboratory Classes

The practical classes conducted in the laboratory includes the following:

- Route planning
- Surveying

Research and Services

Presently, the Surveying, Highway and Transportation Engineering laboratory is working with research related to highway pavement behaviours, pedestrians' safety and behaviors, efficiency of transport modes, and GIS applications for land use changes.

In addition, the laboratory provides specialised services to the industry such as land surveying and contouring, hydrographic surveying, highway design and analysis, testing of highway pavements and materials, transportation planning and evaluation, and GIS applications.

2.5.9 Office of the Department

One technical officer, two management assistants, and two supporting staff members are attached to the office of the Department of Civil Engineering.

Mr APK Perera
Senior Staff Technical Officer

Ms MIS Farisa
Management Assistant/
Secretary to the Head of the Department

Mr NB Mawelagedara
Management Assistant

Mr MGA Chulanatha
Supporting Staff Member

Mr TRS Bandara
Supporting Staff Member

2.5.10 Other Departmental Entities

Two entities are established in the department with specific objectives: Departmental Quality Assurance Cell (DQAC) to maintain and improve the standards of the degree programme and Department–Industry Interaction Cell (DIIC) to strengthen the relationship between the Department of Civil Engineering and the industry leading to a mutually beneficial partnership.

Departmental Quality Assurance Cell (DQAC)

The Departmental Quality Assurance Cell (DQAC) of the Department of Civil Engineering was established in 2017 under the coordination of a senior staff member and overall supervision of the Head of the Department. The DQAC is the dedicated entity to coordinate and implement the best practices to ensure programme quality and accreditation essentials of the Civil Engineering Degree Programme and maintains the quality assurance related documents of the programme.

The DQAC is managed by a coordinator and a committee appointed by the Head of the Department and is responsible for:

- Implementing the quality assurance action-plan of the Civil Engineering degree programme of the department and monitoring the performance of the quality control process,
- Representing the department on quality assurance matters of the Civil Engineering degree programme,
- Preparing the department for external reviews and internal reviews at the faculty and university levels,
- Submitting recommendations to uplift the quality of the Civil Engineering degree programme based on stakeholder feedback, public surveys, statistics and other information, and
- Liaise with the Internal Quality Assurance Cell (IQAC) of the Faculty of Engineering in relation to faculty and university level policies and practices.

Department - Industry Interaction Cell (DIIC)

The Department-Industry Interaction Cell (DIIC) was established on 1st February 2022 to strengthen the relationship between the Department of Civil Engineering and the Industry leading to a mutually beneficial partnership. The DIIC comprises three permanent academic staff members of the Department of Civil Engineering on voluntary, part-time basis and assigned by the Head of the Department (HoD), who function under the overall guidance and direction of the HoD. An advisory panel comprising nominated staff members and eminent industry personnel is associated with DIIC for consultation on a regular basis. Among other activities, the DIIC organizes consultative committee meetings twice a year with leaders of the industry and civil engineering practice in the country and organises the 'Research for Industry (R4I)' webinar series to sustain a continuous interaction with the industry and to understand the latest trends and industry requirements.

The tasks assigned to the DIIC include:

- Dissemination of information on ongoing and completed research to the industry
- Identification and collation of research requirements of the industry
- Securing of mutually beneficial funding for research and postgraduate training
- Application and commercialization of research outcomes in partnership with the industry
- Initiation and organization of industry visits, seminars by industry experts
- Organizing and hosting of Research for Industry Webinar series
- Facilitation of Department-Industry Consultative Committee (DICC) meetings
- Coordination with faculty level Engineering Technology Incubation Centre (ETIC)
- Matters connected to students undergoing industrial training in liaison with ITCGU

DICC Meeting, 2018
IESL Headquarters, Colombo

2.5.11 Departmental Committees and Activities

The Head of the Department has appointed an array of standing committees to effectively coordinate and perform regular departmental activities. There are 23 such departmental committees currently covering all aspects of the department including the following areas.

Curriculum Development, Programme Analysis and Accreditation

There are several committees working integrated with each other to ensure that an updated curriculum is maintained up to the Washington Accord standards. The main tasks of the above committees are those related to IESL/Washington accord accreditation reviews, further enhancement of staff-wide capacity in developing course/programme learning outcomes and 'mapping' in association with the departmental quality assurance cell, conducting awareness sessions for students on PEOs, expected attributes and outcomes, submitting revised/re-oriented curriculum for the full programme, implementing the revisions, benchmarking the programme with appropriate reputed overseas universities, exploring and initiating links with selected regional and world recognised Civil Engineering departments, maintaining and improving an effective teaching and learning environment including LMS and the associated document management system, collating and analyzing of data and feedback from stakeholders including recent graduates regularly, guiding students and staff on faculty level examination-related matters, teaching work distribution among academic staff of three major sub-disciplines, assisting head of the department in preparation of evaluation panels, collation of information necessary for preparation of timetables.

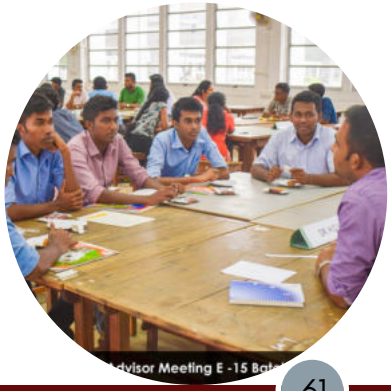
Student Wellbeing, Counselling and Career Guidance

Since the primary beneficiaries of the degree programme are the undergraduates, the department strives to support them in many ways including through mentoring, and counselling where needed. In addition, a proper guidance to their career is immensely helpful as the graduates move directly to the industry as professionals. In order to achieve this aim, the committees tasked with the student wellbeing, counselling and career guidance as well as health and safety have formulated strategies and plans for further strengthening of departmental level student wellbeing, welfare, counselling and career guidance particularly in view of the ongoing challenging economic situation, monitoring and reviewing of implementation of such strategies and plans, paying attention to the general health and safety issues related to teaching and learning, and ensuring the preparedness and coordination in managing health and safety concerns, issues and emergencies.

Academic Coordinators

The Department of Civil Engineering, as a whole, is a large department with an array of sub-disciplines, laboratories, and courses. Therefore, in order to ensure the smooth and efficient administration, the coordination of the academic programme and other activities has been distributed among the academic staff members who ultimately report to the Head of the Department. A course coordinator is assigned to each course offered by the department to whom the undergraduates may direct their queries regarding that particular course.

In addition, each batch of students has been assigned with an academic coordinator who overlooks the overall performance of each batch and addresses their queries, if any. Moreover, every 5-6 students of each batch have been assigned to a student advisor/mentor. The student advisor guides the students/mentees in the course registration process, and clarify and address issues pertaining to the students at a closer level.



Research Promotion and International Collaboration

The research output of a university is one of the main components that contribute to its international standing and reputation and both postgraduate and undergraduate students of the Department are engaged in a wide-array of high-quality research. Further, a series of regular research seminars are being conduced to present and discuss ongoing research activities by the staff members as well as postgraduate students. In addition, the research promotion and internal collaboration committee promotes research work with local/overseas universities and institutions, supports staff members to initiate and sustain research work, facilitates smooth progress of ongoing research, plans strategies for securing funding, organises departmental research seminar series, initiates collaborations with local/foreign universities and institutions, advises the Civil Engineering Research Club (CERC) composed of full-time research students of the department, and disseminates completed and ongoing research to stakeholders and the general public.

Health and Safety

Considering the importance of health and safety aspects of the students in laboratory and field work, the department takes precautions to minimize the potential risks to the students, staff and the instruments. All students are provided with a health and safety guide which they shall adhere to during experimental and field studies. They are supposed to carry out a safety audit before commencing any experiment in a laboratory. Some laboratories have laboratory-specific safety measures in addition to the general safety guide.

CHAPTER 3

DEGREE PROGRAMME

3. Degree Programme

3.1 Programme Educational Objectives

The BScEngHons graduate specializing in Civil Engineering is expected to achieve the following Programme Educational Objectives (PEOs):

1. Identify, analyze and solve complex problems based on basic principles of engineering sciences and mathematics

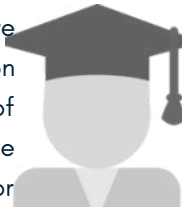
2. Produces innovative engineering designs and solutions considering functionality, aesthetics, safety, cost effectiveness, environmental friendliness and socio-cultural aspects

3. Manage and execute engineering projects of multi-disciplinary nature giving due consideration to local community, local industry and national heritage

4. Promote themselves as leaders in the international arena in their chosen profession as well as in other interested areas through effective communication, lifelong learning, research and development activities

3.2 Graduate Profile

The Civil Engineering Graduates of University of Peradeniya are expected to have acquired the following attributes/characteristics upon graduation. These graduate attributes are based primarily on those of the International Engineering Alliance (IEA) and adopted by the Washington Accord (WA) signatory countries across the world for accreditation of engineering degree programmes. The Department of Civil Engineering has fortified the following to the attitude profile of its graduates.



14
GRADUATE ATTRIBUTES

1 ENGINEERING KNOWLDGE

Apply knowledge of mathematics, natural science, computing, and fundamentals of general engineering and the engineering specialization to develop solutions to complex engineering problems

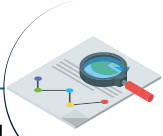
2 PROBLEM ANALYSIS

IIdentify, formulate, research literature and analyse complex engineering problems to reach substantiated conclusions using principles of natural and engineering sciences, mathematics and other computational tools with holistic considerations for sustainable development

3 DESIGN/DEVELOPMENT OF SOLUTIONS

Design solutions for complex engineering problems and design systems, components or processes in a holistic manner to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, national heritage, environmental and disaster risk considerations as required.

4 INVESTIGATION/RESEARCH



Conduct investigations of complex engineering problems using existing knowledge and new knowledge derived through research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions

5 TOOL USAGE

Create, select and apply appropriate techniques, resources, and modern engineering, computational and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitation

6 THE ENGINEER AND THE WORLD

Analyse and evaluate sustainable development impacts to society, the economy, sustainability, health and safety, legal frameworks, cultural sensitivities, and the environment, when solving complex engineering problems

7 PROFESSIONAL ETHICS

Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, understand the importance of standing against unethical practices, adhere to relevant national and international laws, and demonstrate an understanding of the need for diversity and inclusion

8 INDIVIDUAL AND COLLABORATIVE TEAM WORK

Function effectively as an individual, andas a member or a leader in diverse teams and in multi-disciplinarysettings

9 COMMUNICATION

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective and authentic reports and prepare design documentation, make effective presentations, and give and receive clear instructions

10 PROJECT MANAGEMENT AND FINANCE

Demonstrate knowledge and understanding of engineering management principles, sound finance and economic decision-making and apply these to one's own and collective work, as a leader and/ or a member in a team, to optimally manage projects and in multi-disciplinary environments

11 LIFELONG LEARNING

Recognize the need for, and have the preparation, desire and ability to engage in independent and lifelong learning in the broadest context of technological change

12 CREATIVITY AND INNOVATION

Creativity in engineering solutions; innovative thinking and approaches to engineering tasks and problem solving

13 RESPONSIBLE CITIZEN

Cultivates a strong value system that incorporates punctuality, fidelity, honesty, dependability, dignity, caring, approachability, simplicity, empathy, integrity, respecting procedures as well as respect for the autonomy of others, does no harm and does not tolerate harm (physical or emotional) and, being beneficial to others while ensuring fairness and equity at all times

3.3 Structure of the Degree Programme

The degree programme spans over four academic years duration in 8 semesters, with the General Programme in Engineering of one academic year comprising 2 semesters and a Special Session, and the Specialization Programme in Engineering of three academic years comprising 6 semesters and an industrial training course of total duration not less than 20 weeks. After the successful completion of the general programme of engineering in the first year of the degree programme, 150 undergraduates are selected every year to the Civil Engineering specialization programme. The full course is conducted and assessed in the medium of English and the entitled degree is Bachelor of the Science of Engineering Honours (BScEngHons). The courses are organized at five different levels indicated by the course codes in 100, 200, 300, 400 (based on academic year) and 500 series (elective courses). Further details of the curriculum and the courses offered are provided in Chapter 4.

3.4 Examinations and Assessment Strategy

Teaching and assessment at the faculty are essentially conducted in English language. The department ensures effective implementation of the teaching and assessment strategy at the Faculty of Engineering and the course unit system by limiting the class size to 150 students at lectures, 75 students in design classes, 35-40 students at tutorial/discussion classes and generally about six students in laboratory classes. The students shall maintain at least 80% course participation to be eligible to sit for the end of semester examination. The assessment is done for a combination of continuous assessment consisting of assignments, presentations, coursework, project work, quizzes, and tutorials, and examinations held at the mid-semester and at the end of the semester examination. In general, each course is assigned a range of 40% to 60% of marks for the end of semester examination and the balance for mid-semester examination where applicable and for continuous assessments.

The undergraduate course is basically comprised with two stages as general programme and specialized programme. Students should earn 36 credits from the general programme to qualify for the specialized programme. In order to claim the degree, 114 credits should be earned from the specialization programme.

Courses/Projects	Credits for BScEngHons Degree	
Core courses	84	
Regular courses		75
Multi-disciplinary design projects		03
Civil Engineering research project		06
Elective courses	24	
Technical electives		16
General electives		08
Industrial Training	06	
Total	114	

114

TOTAL CREDITS TO BE EARNED

(for specialized programme)

Methods of Assessment

Grade points shall be awarded for each course with grade points allocated on a four-point scale as tabulated below. The table also shows the recommended conversion from percentage score to a grade where assessment for a course is expressed as a percentage score.

Marks	Grade	Grade points
>85	A+	4.0
80 - 84	A	4.0
75 - 79	A-	3.7
70 - 74	B+	3.3
65 - 69	B	3.0
60 - 64	B-	2.7
55 - 59	C+	2.3
50 - 54	C	2.0
45 - 49	C-	1.7
40 - 44	D+	1.3
35 - 39	D	1.0
< 35	E	0.0

The minimum grade required to earn credit in any course shall be a C. The maximum grade point accruing to a student repeating a course shall correspond to a grade C. To be eligible to follow a course with prerequisites, a student should have a grade of D or above in every course that is stipulated as a prerequisite. Under exceptional circumstances, acceptable to the Faculty Board, the Dean may authorize awarding an "Incomplete" grade to a student who fails to comply with a compulsory requirement of a course based on a written submission supporting compelling reasons. An "Incomplete" grade will enable the student to complete the course concerned at a later date with the approval of the Dean.

The Grade Point Average (GPA) is the weighted average of the grade points secured by the student in the courses that are valid for calculating the GPA for the programme concerned.

$$GPA = \frac{\sum_{i=1}^{N} C_i g_i}{\sum_{i=1}^{N} C_i}$$

where, Ci is the credit of the ith course, g*i* is the best grade point earned for the course and N is the total number of courses offered that are valid for the calculation of the GPA; and the GPA is rounded up to the nearest 0.01. English II is not considered in the calculation of the GPA in the General Programme. The General Elective courses and the Industrial Training are not considered in the calculation of the GPA in the Specialization Programme.
For a student repeating a course, the best grade earned subject to a maximum of 'C', should be considered for the calculation of the GPA.

Requirement for the award of the Degree of Bachelor of the Science of Engineering Honours

a) Successful completion of the General Programme in Engineering
b) Successful completion of the Specialization Programme within the stipulated period with a minimum GPA of 2.00
c) Successful completion of mandatory training courses prescribed by the Faculty Board with the approval of the Senate
d) Securing a minimum total of 144 credits excluding the credits from the Industrial Training course but including the credits that accrue to the student on the successful completion of the General Programme in Engineering

a) A student who has followed the prescribed courses with a combined total of 108 course credits excluding the credits from the Industrial Training course in the Specialization Programme in Engineering may be deemed to have earned minimum 108 course credits, provided that the grade in any of the courses is not below a D and the cumulative credit deficit (CCD) defined as follows, does not exceed 12.

b) CCD = Σ cidi for all courses with a grade of D, D+ or C- where, ci is the number of credits associated with a course in which the student has secured a grade of D, D+ or C- and di is the deficit weightage, defined as 1 for a D, 2/3 for a D+ and 1/2 for a C-.

The grade point average is calculated from the courses in the Specialization Programme excluding General Elective courses and the Industrial Training course for the award of Classes.

First Class:	GPA ⩾ 3.70
Second Class (Upper Division):	3.30 ⩽ GPA < 3.70
Second Class (Lower Division):	3.00 ⩽ GPA < 3.30
Pass with Merit:	2.70 ⩽ GPA < 3.00
Pass:	2.00 ⩽ GPA < 2.70

3.5 Awards

The university awards the following medals and prizes (i & ii) at the General Convocation to engineering graduates specializing in Civil Engineering. Academic merit is the sole criterion for the award of Medals and Prizes.

(i) Medals and Prizes for Overall Performance

a) Mr. Helarisi Abeyruwan Gold medal in Civil Engineering is awarded for the student who has recorded the best performance at the BSc. Eng Degree Programe in Civil Engineering based on the highest GPA in Civil Engineering stream.

b) *The Ceylon Development Engineering Prize for Civil Engineering* endowed by the Ceylon Development Engineering Co. Ltd. is awarded to the student with the highest GPA obtained in the Civil Engineering Specialization of the BSc Engineering Honours Degree Programme.

(ii) Prizes for Performance in a Subject

1. The EOE Pereira Prize for Structures (I) endowed by friends and well-wishers of Professor EOE Pereira and awarded to the student with the best performance in CE208 - Structural Analysis
2. The EOE Pereira Prize for Structures (II) endowed by friends and well-wishers of Professor EOE Pereira and awarded to the student with the best performance in CE307 - Finite Element Methods in Solid Mechanics
3. The HB de Silva Prize for Surveying endowed to the Engineering Alumni Awards Fund by Dr AGKdeS Abeysuriya is awarded to the student with the best performance in CE210 - Engineering Surveying
4. The A Thurairajah Prize for Geotechnics endowed to the Engineering Alumni Award Fund by Mr PM Gunasekara is awarded to the student with the best performance in CE310 - Geotechnical Engineering
5. The M Amaratunga Prize for Strength of Materials endowed to the Engineering Alumni Awards Fund by Professor MP Ranaweera and awarded to the student with the best performance in CE201 - Mechanics of Materials (I)
6. MP Ranaweera Prize for Finite Element Methods in Solid Mechanics awarded based on the performance in the course CE307 - Finite Element Methods in Solid Mechanics
7. MP Ranaweera Prize for Computer Aided Structural Design is awarded based on the performance in the course CE594 - Computer Aided Structural Analysis and Design

Award for Best Civil Engineering Projects

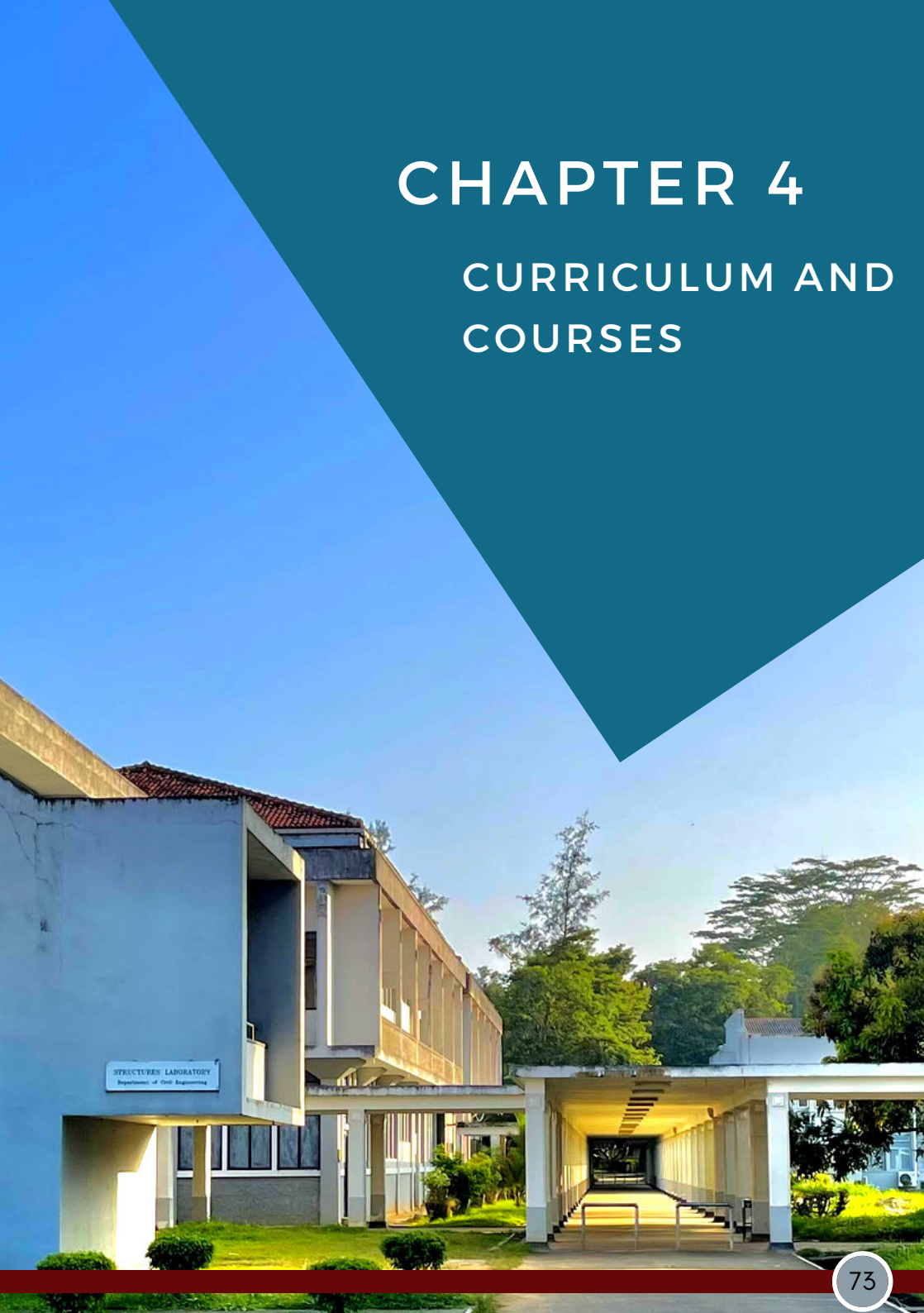
Prof. Nimal Seneviratne Award for Best Civil Engineering Projects, with three awards in each sub-discipline, namely Geotechnical and Transportation Engineering; Materials and Structural Engineering; and Water and Environmental Engineering.

Awards/Prizes through PEFAA

1. Dr N. Nandakumar prize for the best performance in CE205 Engineering Hydrology.
2. Prof. E.F. Bartholomeusz prize engineering mathematics projects.

CHAPTER 4

CURRICULUM AND COURSES



4. Curriculum and Courses

4.1 Curriculum

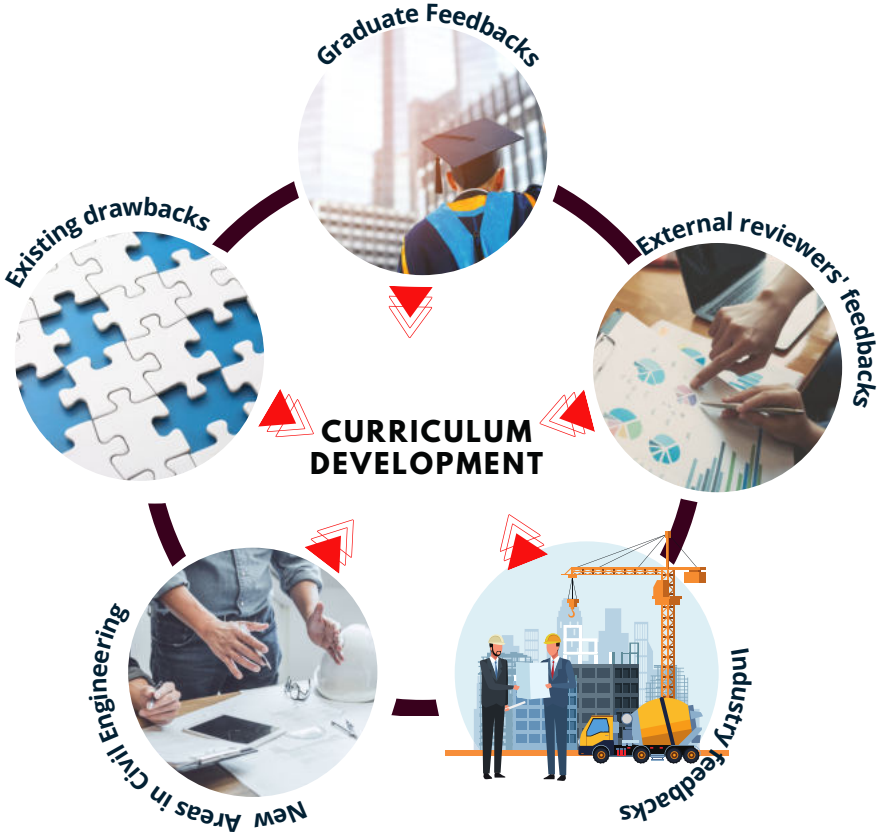
The course structure for specialization in Civil Engineering commencing from the third semester and effective up to E/21 is summarized in the following. The web-link to the detailed curriculum effective up to E/21 as well as the revised curriculum effective from E/22 is presented in the **Annex.**

		CODE	TITLE	CREDITS	PRE-REQUISITES
YEAR 2	SEMESTER 3	CE201	Mechanics of Materials I	3	-
		CE202	Fluid Mechanics I	3	-
		CE210	Engineering Surveying	3	-
		EE280	Introduction to Electrical Engineering I	3	-
		EM211	Ordinary Differential Equations	2	-
		EM213	Probability and Statistics	2	-
		ME202	Mechanical Engineering for Civil Engineers	3	-
	SEMESTER 4	CE204	Geomechanics	3	CE201
		CE205	Engineering Hydrology	3	-
		CE208	Structural Analysis	3	CE201
		CE209	Building Construction	3	-
		CE219	Civil Engineering Laboratory I	1	CE201, CE202
		EM212	Calculus II	2	-
		MA201	Engineering Management	3	-

YEAR 3	SEMESTER 5	CE302	Environmental Engineering	3	-
		CE305	Hydraulics	3	-
		CE312	Design of Structures II	3	CE208
		CE310	Geotechnical Engineering	3	CE204
		CE318	Transportation and Highway Engineering	3	-
		CE319	Civil Engineering Laboratory II	1	CE202, CE204
		EM315	Numerical Methods for Civil Engineers	2	-
			General Electives		
	SEMESTER 6	CE306	Design of Structures I	3	CE208
		CE307	Finite Element Methods in Solid Mechanics	3	CE201
		CE308	Geotechnical Design	2	CE310
		CE311	Hydraulic Engineering and Design	3	-
		CE316	Advanced Mechanics of Materials	2	CE201
		CE317	Civil Engineering field work	3	CE210
		CE320	Civil Engineering Laboratory III	1	CE219, CE319
			Technical Electives/General Electives		
YEAR 4	SEMESTER 7	CE403	Construction Management	3	MA201
		CE405	Civil Engineering Project I	3	-
			Technical Electives/General Electives		
	SEMESTER 8	CE402	Multi-Disciplinary Design Project	3	-
		CE406	Civil Engineering Project II	3	CE405
			Technical Electives/General Electives		

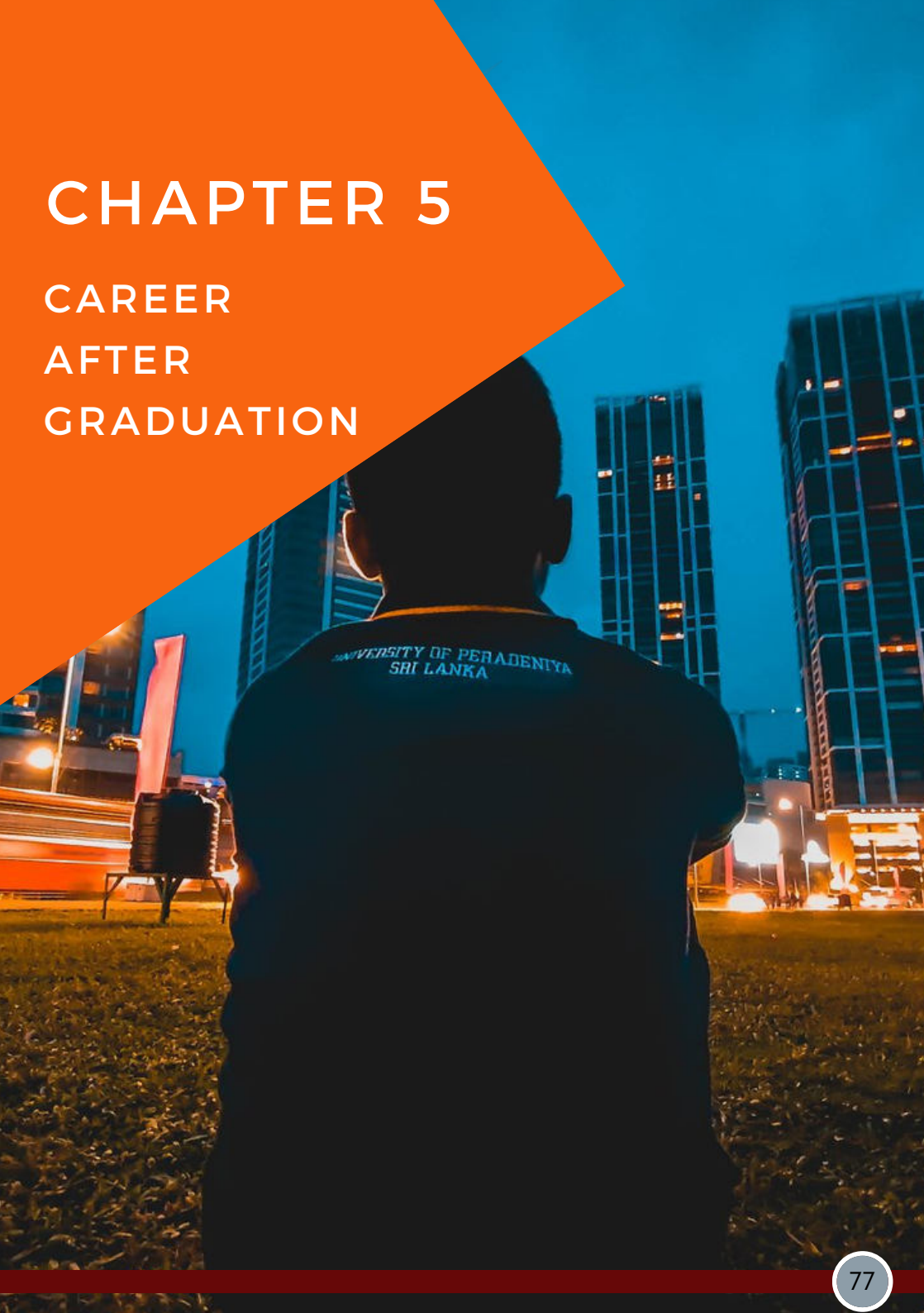
4.2 Curriculum Development

The Department of Civil Engineering strives to be up-to-date to provide the students with the state-of-the-art knowledge in all its major subdisciplines. Accordingly, the Department regularly reviews the existing curriculum and embarks on continuous curriculum enhancement also considering the feedback of undergraduates, graduates, external reviewers and the industry, while assessing existing drawbacks and exploring the incorporation of new technologies and developments.



CHAPTER 5

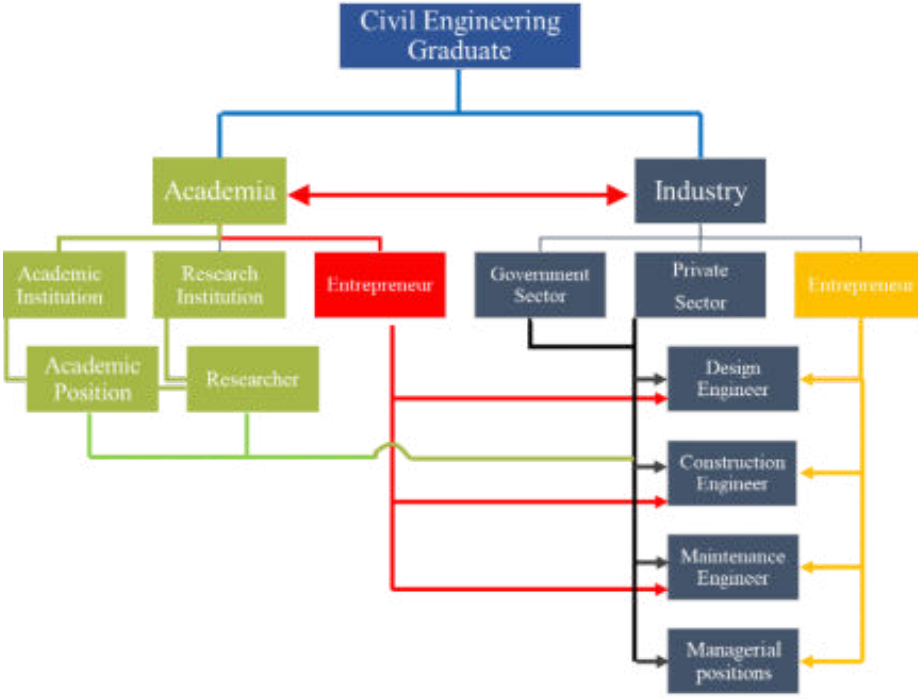
CAREER AFTER GRADUATION



5 Career After Graduation

5.1 Overview

A civil engineering graduate may join the industry or academia according to his/her preference. Both the industry and academia have different roles for civil engineers to play and most of them are interconnected. The following figure illustrates the different paths that a civil engineering graduate may take in after graduation and how they are inter-connected.



5.2 Industry Opportunities

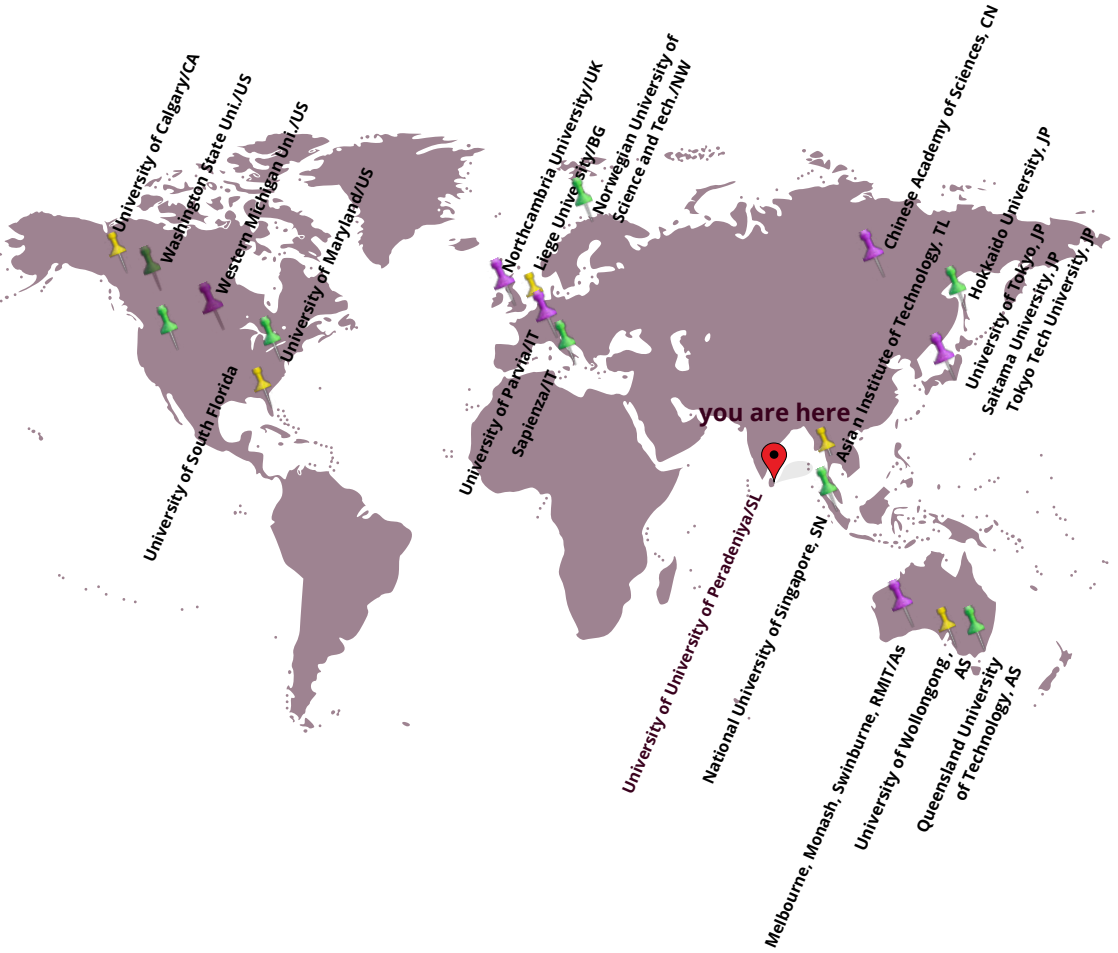
Civil Engineers have opportunities to mainly work in both governmental and private sector organizations at national and international levels and are involved in the analysis, design, construction, maintenance and rehabilitation of a built environment. The broad range of organizations and firms recruiting civil engineers include small startups to multi-national companies. Moreover, civil engineering graduates are involved in different stakeholder positions such as client, consultant, or contractor, for example, in new infrastructure development projects, and after completion, they may hold different roles in maintenance, rehabilitation and expansion as well. The roles and responsibilities of civil engineers in these positions vary depending upon their qualifications and experiences. For instance, civil engineers who work as consultants usually plan, design and supervise a project, while a contractor's engineer is responsible for employing the workforce, procuring materials and machinery, and carrying out the construction according to the client's requirements. Furthermore, the graduates from the department have opportunities to pursue better employment opportunities in the field of engineering in 25 signatory countries of the Washington Accord (WA) including many developed countries, since the degree programme offered by the department is accredited under WA. A Civil Engineer is an essential asset to an infrastructure development project since he/she possesses necessary technical and soft skills to manage the workforce, resources, and finances optimally.

As Civil Engineers are involved in creation and maintenance of built environments in connecting between physical space and social consequences, they have employment opportunities to collaboratively work with other engineering disciplines or in different fields such as financial services, insurance services and public services.

5.3 Opportunities for Postgraduate Studies and in Academia

A large number of graduates have enrolled in Masters and Doctoral degree programmes in renowned foreign universities all over the world, securing prestigious scholarships offered by such universities. For instance, since 2018, more than 48 students from four batches have secured scholarships at over 28 renowned universities/institutions to pursue their postgraduate studies. In addition, every year, many graduates get opportunities to pursue their postgraduate studies in the department and some of which is funded by local/international research projects and through joint-programmes with reputed foreign universities/institutions. Currently, more than 30 graduates are following their postgraduate research full-time at the department. Furthermore, up to four scholarships are offered annually to follow the MScEng degree programme on full-time basis in the department.

Postgraduates can have opportunities to hold academic positions in local and foreign universities for teaching and research in different sub-disciplines. Furthermore, they can join research organizations/institutions to engage in developing new knowledge with industrial applications.



Some of the overseas universities where former students of the Department are pursuing their postgraduate studies in the past 2-3 years

CHAPTER 6

CIVIL ENGINEERING SOCIETY

6 Civil Engineering Society (CES)

Being one of the longest serving societies within the Sri Lankan university system, the CES has survived and thrived through nearly 50 years of its history. The Civil Engineering Society of the University of Ceylon was established in 1973 under the auspices of Prof. HB De Silva, the dean of the faculty and Prof. A Thurairajah, for the purpose of serving a whole gamut of academic and co-curricular requirements of students as well as the staff. Dr K Shanmuganthan had the privilege of bearing the inaugural presidency of the society. Due to the untiring efforts of Dr K Shanmuganthan and Prof. A Thurairajah and the commitment of all members, the society managed to achieve an appreciable growth within its first year of existence itself.

The first activity organized by the society on the 15th of February 1973 was a talk on hydrology by Mr DGL Rathnathunge of the Irrigation Department. The annual seminar of the CES which is one of the awaited events of the University of Peradeniya was also started in the inaugural year of the society. Further, a symposium on housing was held in June 1973 at the faculty auditorium.

Prof. A Thurairajah was elected to the presidency in 1974 which he held for two consecutive years and rendered an enormous service towards the development of the society.

The structure of the committee and the constitution of the society has not changed much since the time of establishment apart from the addition of the post of editor in 1979, and the establishment of a number of permanent sub-committees in early 1990. The CES acquires more than 150 new members each year and most of them take part in its activities in various capacities.

Being the largest engineering body based in the University of Peradeniya, the main objective of this society is to bring the staff, students and the industry to a common platform; and thereby improve the standards of the Civil Engineering profession by exchanging the facts and views of different segments of the profession. In achieving this goal, the CES engages itself in organizing various activities, such as, industrial visits, presentations and talks, seminars, and social activities, etc. The society has stood a firm test of time for nearly 50 years and has proven itself to be fit and worthy to survive the times to come.

Vision

The Civil Engineering Society will be a significant contributor to the Faculty of Engineering in achieving its vision of becoming the center of excellence in engineering education and research in South Asia

Mission

The mission of the Civil Engineering Society is to provide a common platform, through various activities, for the Civil Engineering students, the staff and the industry to interact and thereby, enrich their academic and professional lives.

The regular activities conducted by CES include:

- CES talks series is organized twice a month under the patronage of resource persons from the industry and higher education institutes to share their experiences
- CES annual seminar links, industry and the faculty.
- CES soft skills workshops provides an opportunity to improve soft skills of the students.
- Civil Engineering field trips provide budding engineers the way theory is in practice.
- Civil Engineering Project Symposium is a stage for final year engineering students to exhibit their research potential.

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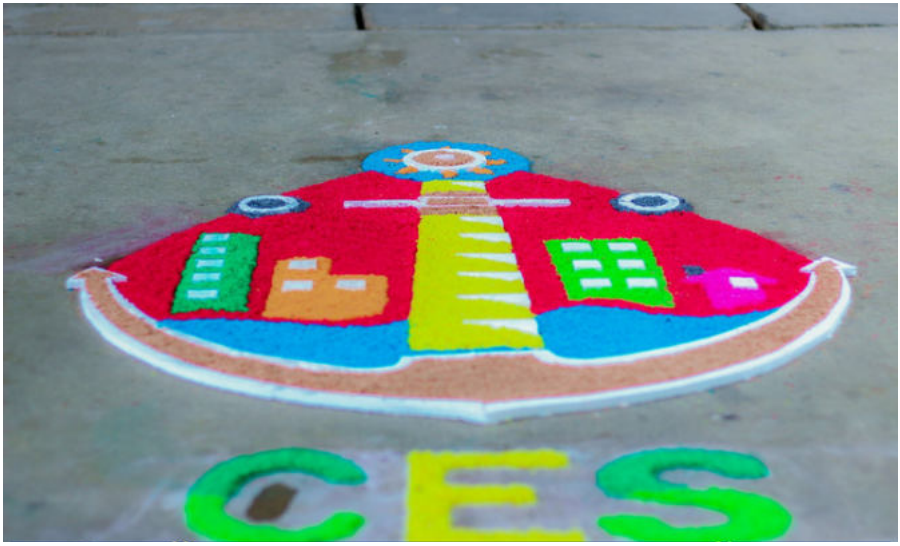


CIVIL ENGINEERING SOCIETY
FACULTY OF ENGINEERING
UNIVERSITY OF PERADENIYA
Executive Committee - 2024
President
DR. SAMAL DHARMARATHNA
Secretary
DR. SAHAN BANDARA
Treasurer
DR. SUPUN JAYASINGHE
Vice President
MR. ISURU DILAN
Junior Vice President
MR. SHANUKA THENNAKOON
Joint Secretary
MR. DELOSHAN VIGNESWARAN
Assistant Secretary
MR. NATHAN SUBAKETHAN
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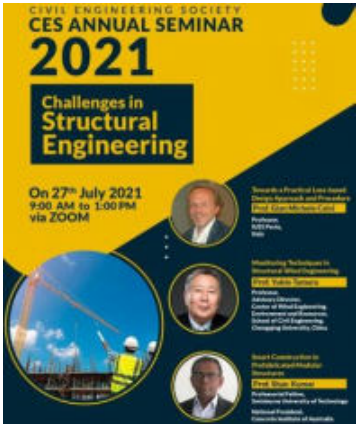
MR. DEVISHKA LAKNUWAN
Editor
MR. DHARAKA GUNASEKERA
Web Master
MR. SHANUKA MALSHAN
Junior Editor
MS. KALANI SENANAYAKE
Junior Web Master
MS. VIMANSA LIYANAGE
E18 Representative
MR. RUSITH KAVINDA
E19 Representative
MR. SENITH KAVINDRA
E20 Representative
MR. SAMPATH UDAYATHUNGA

Glimpses of Recent CES Activities

A session on "Role of Engineers in Application of Water Safety Plans" - June 2022

Snaps from CES talk series

Glimpses of Recent CES Activities



CES Annual Seminar 2021 (virtual)

CES Annual Seminar 2018

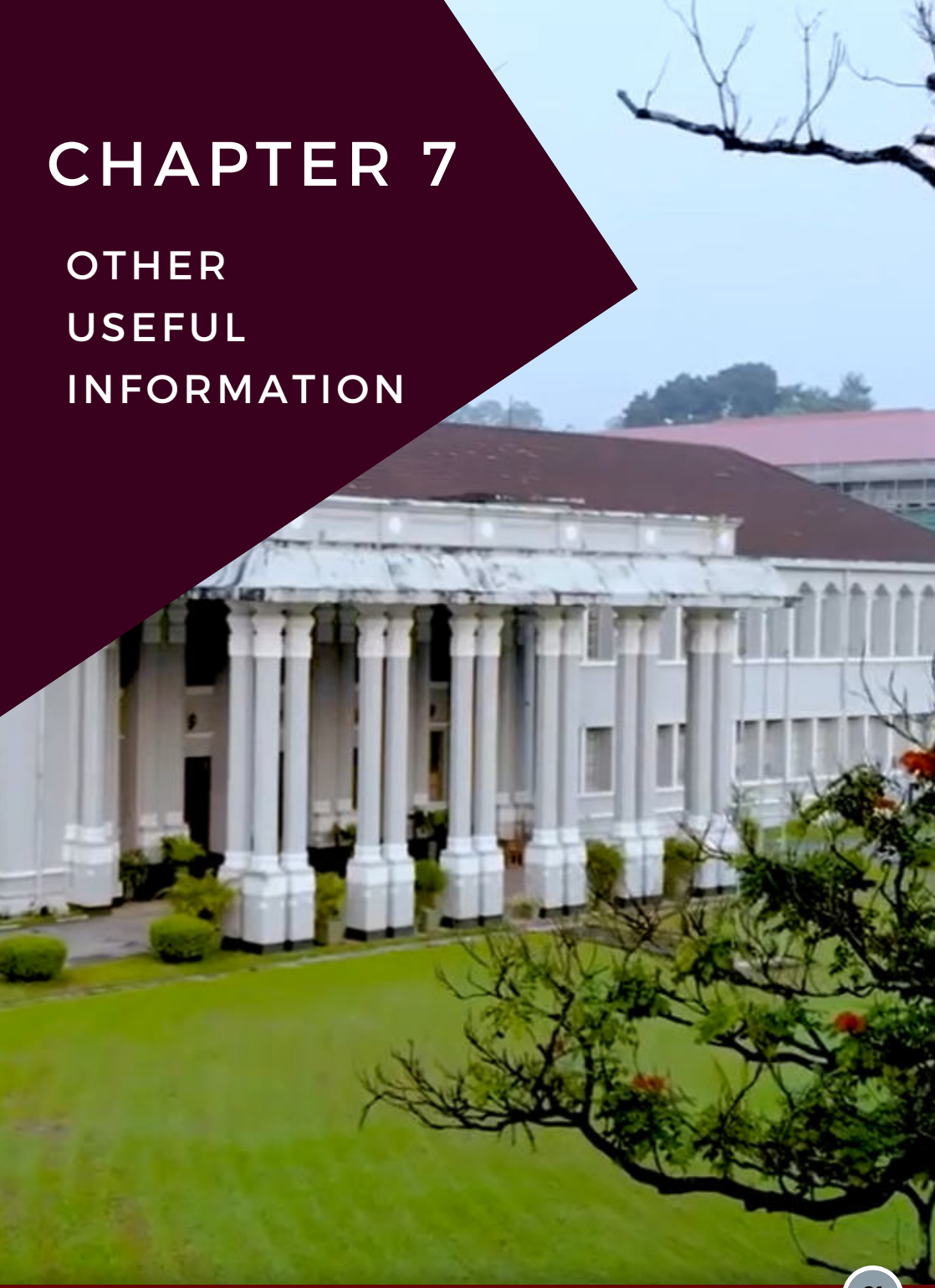
Glimpses of Recent CES Activities

Glimpses of Recent CES Activities

Glimpses of Recent CES Activities

CHAPTER 7

OTHER USEFUL INFORMATION



7.1 Department and Faculty websites

Department of Civil Engineering | U niversity of Peradeniya

https://eng.pdn.ac.lk/civil/

Faculty of Engineering | U niversity of Peradeniya

https://eng.pdn.ac.lk/

7.2 Course Contents

CE Specialization - Effective up to E/21, and

CE Specialization - Effective from E/22

available at:

https://eng.pdn.ac.lk/civil/undergraduate/SPcourselist.php

7.3 Department's Research Magazine

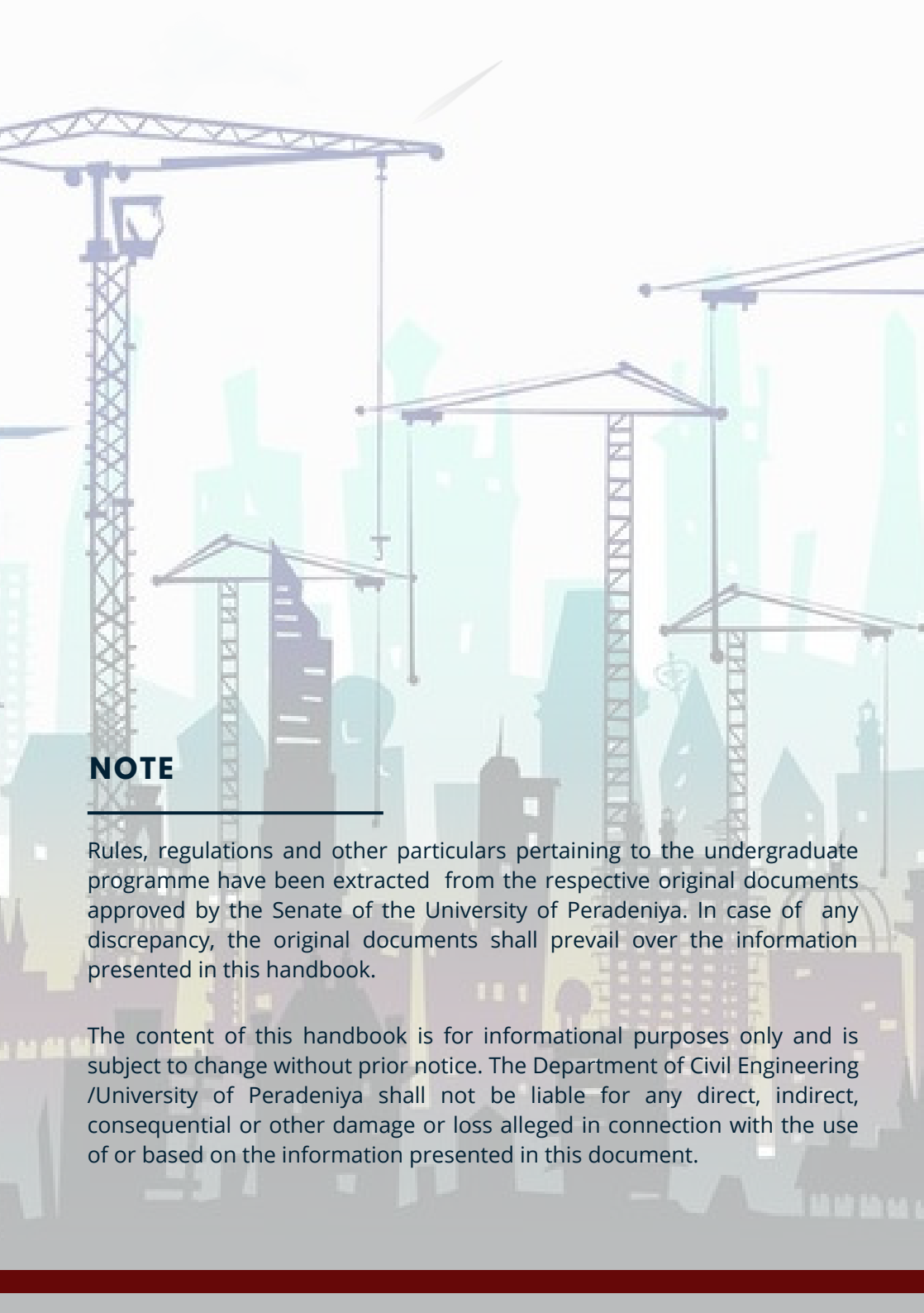
https://eng.pdn.ac.lk/civil/resources/insight.php

Volume 1 Issue 1
2022-MAR

Volume 1 Issue 2
2022-AUG

Volume 2 Issue 1
2023-MAR

Volume 2 Issue 2 (2023-Dec) and Volume 3 Issue 1 (2024-Sep) are also available.



NOTE

Rules, regulations and other particulars pertaining to the undergraduate programme have been extracted from the respective original documents approved by the Senate of the University of Peradeniya. In case of any discrepancy, the original documents shall prevail over the information presented in this handbook.

The content of this handbook is for informational purposes only and is subject to change without prior notice. The Department of Civil Engineering /University of Peradeniya shall not be liable for any direct, indirect, consequential or other damage or loss alleged in connection with the use of or based on the information presented in this document.

DEPARTMENT OF CIVIL ENGINEERING

FACULTY OF ENGINEERING

UNIVERSITY OF PERADENIYA

SRI LANKA

Pioneers in Civil Engineering Education in Sri Lanka