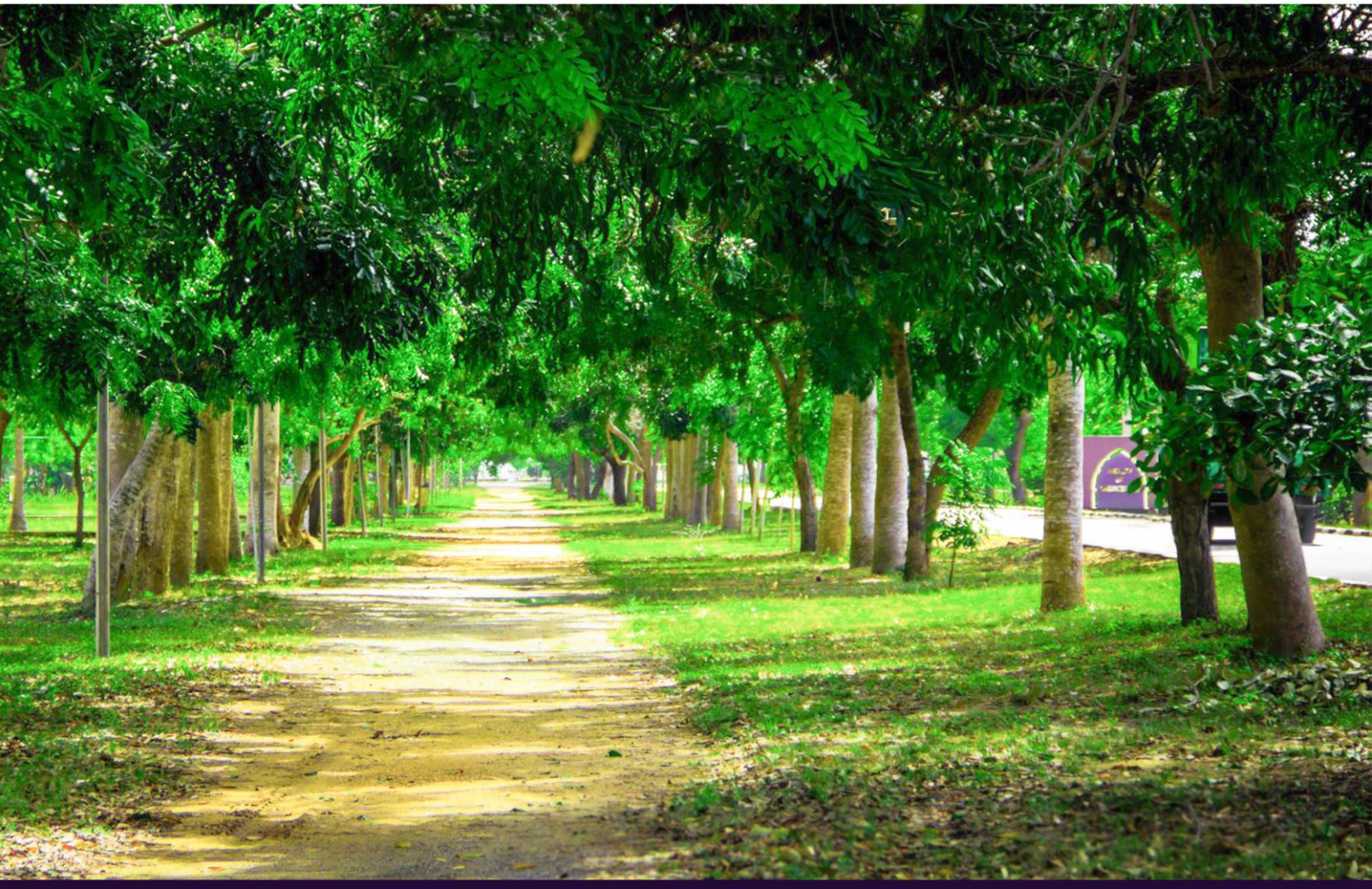
UNDERGRADUATE HANDBOOK 2022



FACULTY OF ENGINEERING

SOUTH EASTERN UNIVERSITY OF SRI LANKA

UNDERGRADUATE HANDBOOK 2022

FACULTY OF ENGINEERING

SOUTH EASTERN UNIVERSITY OF SRI LANKA

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Faculty of Engineering
South Eastern University of Sri Lanka
University Park
Oluvil # 32360
Sri Lanka

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This handbook is applicable to the batches of students admitted to the BSc Engineering programme after 01 May 2022 and the students following the programme together with the batches admitted after 01 May 2022 until otherwise subsequently amended. The conduct of the academic work for the award of the degree is performed according to the academic policies and regulations approved by the Senate of South Eastern University of Sri Lanka on the recommendation of the Faculty of Engineering.

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South Eastern University of Sri Lanka

VISION

To be an Internationally Renowned Centre in South Asia for Higher Learning and Innovations in Sciences, Technologies and Humanities

MISSION

To Provide Expanded Opportunities for Higher Learning of International Standards through Generation and Dissemination of Knowledge and Innovations Focused on Regional and National Needs, Social Harmony and Stakeholders' Empowerment and Satisfaction

Faculty of Engineering

VISION

A Centre of Engineering Education and Innovation, Internationally recognized and nationally most preferred

MISSION

To create opportunities for stakeholders in the field of engineering by providing technically competent and well-rounded education, developing an environment that fosters high quality learning, student centred teaching, and research, and promoting collaboration with state and private sectors for sustainable development of the nation

Graduate Attributes

Engineering Knowledge	Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization in the chosen engineering discipline to develop solutions to complex engineering problems.
Problem Analysis	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development.
Investigation	Conduct investigations of complex engineering problems using research methods including research-based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
Design / Development of solutions	Develop creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon emissions as well as resource, cultural, societal, and environmental considerations.
Modern Tool Usage	Create, select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and information technology (IT) tools, including prediction and modelling, to complex engineering problems.
Individual and Team work	Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary/multi-cultural, face-to-face, remote and distributed settings.
Communication	Communicate effectively and inclusively on complex 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, taking into account cultural, language, and learning differences.
Project Management and Finance	Apply knowledge of engineering management principles and economic decision-making to one's own work, as a member and leader in a team, and to manage projects in multidisciplinary environments.
The Engineer and the World	When solving complex engineering problems, analyse and evaluate the development impacts to society, the economy, sustainability, health and safety, legal frameworks, and the environment.
Ethics	Apply ethical principles, commit to professional ethics and norms of engineering practice, and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion.
Life-long learning	Recognize the need for, and have the preparation and ability for (i) independent and life-long learning (ii) adaptability to new and emerging technologies and (iii) critical thinking in the broadest context of technological change.

Note: These are adapted from the Washington Accord Graduate Attribute Profiles of 'Graduate Attributes and Professional Competency Profiles, Version 4: 21 June 2021, International Engineering Alliance'.

CONTENTS

1 INTRODUCTION TO THE UNIVERSITY

1.1 About the University

The South Eastern University of Sri Lanka (SEUSL) was first established as the South Eastern University College of Sri Lanka and commenced to function from 27 July 1995. It was then upgraded to the status of a fully-fledged university from 15 May 1996. There are six faculties in SEUSL at present. Faculty of Arts & Culture, Faculty of Management & Commerce, Faculty of Islamic Studies & Arabic Language, Faculty of Engineering and Faculty of Technology are located in the main campus at Oluvil and Faculty of Applied Sciences is located in the campus at Sammanthurai.

1.2 Administrative Structure

(i) Council

Council is the executive body and governing Authority of the University as provided in the Universities Act No. 16 of 1978 as amended and consists of Vice-Chancellor, Deans of Faculties, two members elected by the Senate from among its members, and persons appointed by the University Grants Commission. The Chairman of the Council is the Vice-Chancellor who presides over the meetings of the Council. The Council without prejudice to the generality of the powers conferred upon it by the University Act will discharge such powers and duties to hold, control and administer the property and funds of the University.

(ii) Senate

Senate is the academic authority of the University. Senate of the University consists of Vice-Chancellor, Deans of Faculties, Heads of Departments of Study, Permanent Professors, Librarian and two teachers elected by each Faculty Board. The Senate is the ultimate authority to decide on all academic matters.

(iii) Chancellor

His Excellency the President of the Democratic Socialist Republic of Sri Lanka appoints the Chancellor who is the titular Head of the University, and holds office for a period of five years reckoned from the date of his appointment. The Chancellor shall preside at convocations of the University.

(iv) Vice-Chancellor

Vice-Chancellor is appointed by the President of the Democratic Socialist Republic of Sri Lanka for a term of three years. The Vice-Chancellor is the principal Executive and Academic Officer of the University, and an ex-officio member & Chairman of both the Council and the Senate. The Vice-Chancellor is entitled to convene, be present, and speak at, any meeting of any other authority of the University or other body. The Vice-Chancellor is also the Accounting Officer of the University and responsible for the execution of policies and measures approved by the Council in relation to the University and, subject to such policies, the direction, supervision and control of the University, including its administration, and for the maintenance of discipline within the university.

(v) Dean

Dean of each Faculty is a full-time officer of the University and the Academic and Administrative Head of that Faculty. The Dean is elected by the Faculty Board from among the Heads of the Departments of study comprising such Faculty for a term of three years reckoned from the date of the election. The Dean is the ex-officio Chairman of the Faculty Board and an ex-officio member of the Council and the Senate.

(vi) Registrar

Registrar of the University is appointed by the Council. The Registrar is a full-time officer of the University and is responsible for the custody of the records and the property of the University. He is also the ex-officio Secretary of the Council and the Senate, and the Assistant Accounting Officer of the University. Subject to the direction and control of the Vice-Chancellor, the Registrar is responsible for the general administration of the University and the disciplinary control of the non-academic staff.

(vii) Bursar

Bursar is appointed by the Council. Subject to the direction and control of the Registrar, the Bursar is responsible for the custody of the funds of the University and its administration.

(viii) Librarian

Librarian is appointed by the Council. The Librarian is a fulltime officer of the University and is responsible for the administration of the library subject to the direction and control of the Vice-Chancellor. The librarian is also an ex-officio member of the Senate.

1.3 Officers of South Eastern University of Sri Lanka

Chancellor

Prof. Achchi Mohamed Ishaq
BS (*Ceylon*), MS (*Washington*), PhD (*Wisconsin*), CEng MICE, FASCE

Vice-Chancellor

Prof. A. Rameez
BA (Hons) (*SEUSL*), PGDip (*UK*), MPhil (*PDN*), PhD (*NUS*)

Deans of Faculties

Faculty of Arts and Culture

Prof. M.M. Fazil
BA (Hons) (*SEUSL*), Dip HR(*IHR*), Dip IA(*BCIS*), MPhil (*Meiji-Tokyo*), PhD (*Malaya*)

Faculty of Applied Sciences

Dr. U. L. Zainudeen
BSc (Hons) (*PDN*), MSc (*PDN*), PhD (*PDN*)

Faculty of Engineering

Dr. S.M. Junaideen
BSc Eng (Hons) (*PDN*), MPhil (*HKU*), PhD (*HKU*), CEng, MIE (*SL*)

Faculty of Islamic Studies and Arabic Language

Prof. S.M.M. Mazahir
BA (Hons) (*PDN*), PGDip (*KSU*), MPhil (*PDN*), PhD (*Malaya*)

Faculty of Management and Commerce

Dr. S. Safeena MG. Hassan
BBA (Hons) (*EUSL*), MSc (*SJP*), PhD (*UJA*)

Faculty of Technology

Dr. U.L. Abdul Majeed
BSc (*SUSL*), MSc (*USJP*), PhD (*USJP*)

Librarian

Mr. M.M. Rifaudeen
BSc Agric. (Hons) (*EUSL*), MLS (*UOC*), ALA

Registrar

Mr. H. Abdul Saththar
BA (*PDN*), PGD (*CISL*), PGDE (*NIE*), PGTM (*PGIM*), MHRPD (*India*)

Bursar (Acting)

Mr. CM. Wanniarachchi
BSc (Accountancy - Sp) (*SJP*)

2 INTRODUCTION TO THE FACULTY

2.1 About the Faculty

The Faculty of Engineering of South Eastern University of Sri Lanka is the fourth Engineering Faculty in Sri Lanka established to offer full-time engineering courses after the Engineering Faculties at University of Peradeniya, University of Moratuwa, and University of Ruhuna. The Faculty was established on 05 December 2012 and declared open on 05 February 2013.

The Faculty consists of five departments and offers a four-year full-time undergraduate programme leading to the Honours Degree of Bachelor of the Science of Engineering in three fields of specialization at present; (i) Civil Engineering, (ii) Electrical & Electronic Engineering and (iii) Mechanical Engineering.

The engineering degree programme has been designed to provide adequate means for the development of the graduate attributes (outlined on page v) that should be acquired by students on completion the programme.

The curriculum comprises a set of core modules that provides a foundation in mathematics, sciences and computing; and a set of integrated modules that provides a broad base in engineering sciences and engineering designs and projects in the chosen field; industrial training to provide an exposure to professional practice; and a set of complementary non-technical subjects.

The primary goals of the Faculty are:

- To produce graduates of distinction who will have the set of qualities, knowledge, skills, and abilities outlined in the *Graduate Attributes*,
- To constantly advance the curricula to the current trend so that the programmes stay nationally and internationally relevant,
- To equip with state-of-the-art infrastructure, laboratory, and library facilities for learning, student-centred teaching, and research,
- To develop academic and social spheres that attract and nurture high quality staff and students,
- To be a faculty in close collaboration with state-owned and private industries and institutions, and
- To engage actively in the activities of professional institutions and communities, and dissemination of knowledge.

2.2 Organizational Structure

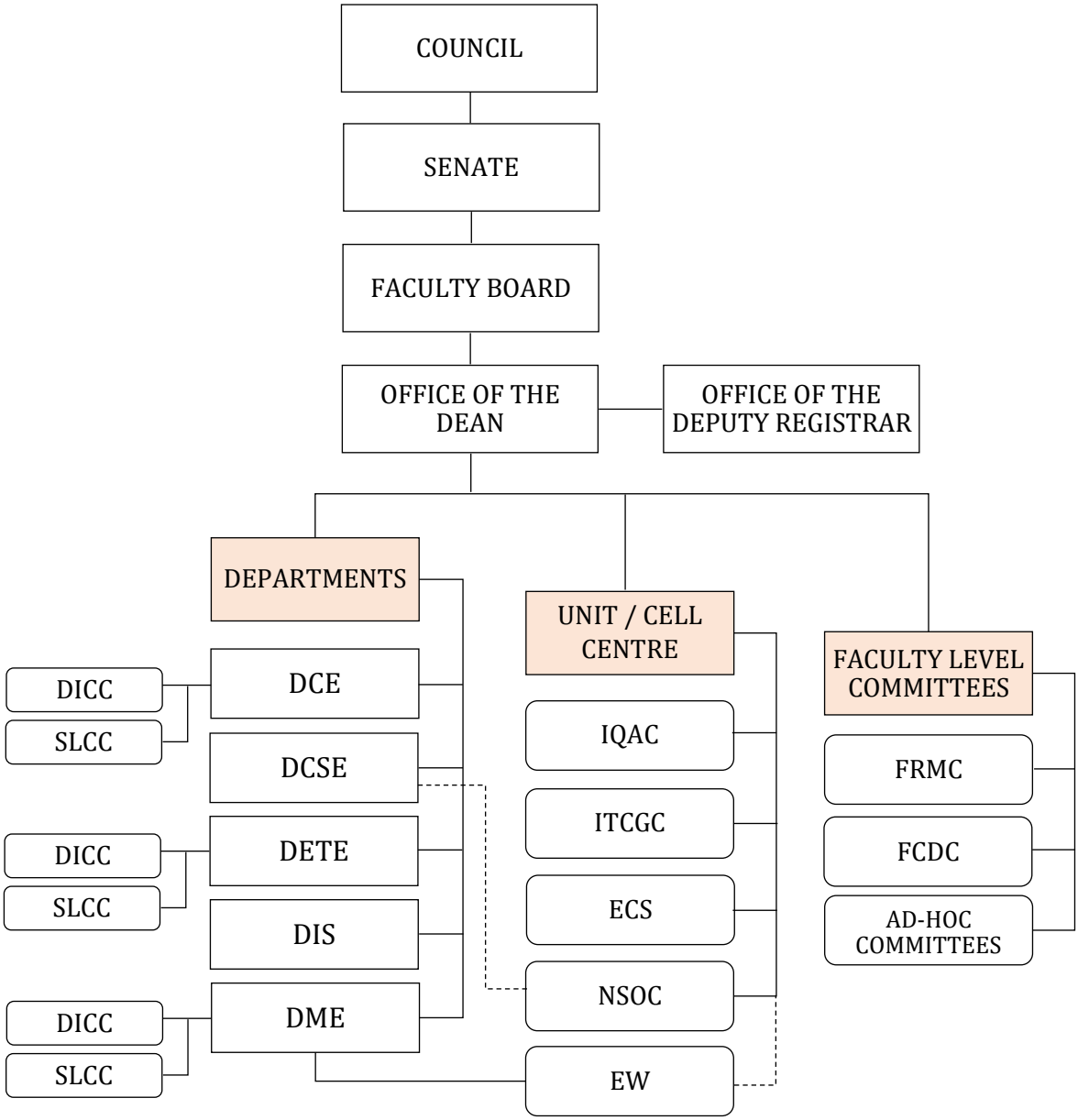
The Office of the Dean is the Administrative Centre of the Faculty providing strategic and operational leadership in administrative and academic matters in line with the policies of the University.

Department of Civil Engineering (DCE), Department of Electrical & Telecommunication Engineering (DETE), and Department of Mechanical Engineering (DME) conduct the academic programmes in their respective discipline, namely Civil Engineering (CE), Electrical and Electronic Engineering (EEE), and Mechanical Engineering (ME). Department of Computer Science and Engineering (DCSE) presently offers a set of modules to EEE and ME programmes and is preparing to commence a degree programme in computer engineering in the near future. Department of Interdisciplinary Studies (DIS) offers modules that are common to the above three programmes.

The following units provide services to the Faculty under the direction of the Dean and the respective Head of the Department: Industrial Training and Career Guidance Center (ITCGC), Engineering Workshops (EW), Internal Quality Assurance Cell (IQAC), Engineering Consultancy Services (ECS), Network and System Operation Centre (NSOC). These units are led by a Director or Coordinator / In-Charge appointed by the University Council or the Faculty Board.

Faculty Research Management Committee (FRMC), Faculty Curriculum Development Committee (FCDC), Department-Industry Consultative Committees (DICC), and Staff-Student Liaison Committees (SSLC) oversee research activities, curriculum development process, stakeholder participation, and welfare matters of students. The chairpersons for the faculty-level committees (FRMC, FCDC, and Ad-Hoc Committees) are appointed by the Faculty Board and department-level committees (DICC and SLIC) are chaired by the respective Head of the Department.

The organizational structure of the Faculty is presented in Figure 2.1 on the next page. Besides, there are common university entities shared by all the faculties: Main Library, Examination Division, Physical Education Unit, Career Guidance Unit, Internal Quality Assurance Unit, Staff Development Centre, and Health Centre.



DCE: Department of Civil Engineering
DCSE: Department of Computer Science and Engineering
DETE: Department of Electrical and Telecommunication Engineering
DIS: Department of Interdisciplinary Studies
DME: Department of Mechanical Engineering
DICC: Department - Industry Consultative Committee
SSLC: Staff – Student Liaison Committee

IQAC: Internal Quality Assurance Cell
ITCGC: Industrial Training and Career Guidance Center
ECS: Engineering Consultancy Services
NSOC: Network and System Operation Centre (in the formation stage)
EW: Engineering Workshops
FRMC: Faculty Research Management Committee
FCDC: Faculty Curriculum Development Committee

Figure 2.1. Faculty Organizational Structure

2.3 Staff of the Faculty of Engineering

Administrative Staff

Dean
Dr. S.M. Junaideen
BSc Eng (Hons) (*PDN*), MPhil (*HKU*), PhD (*HKU*), CEng, MIE (*SL*)

Head, Department of Civil Engineering
Eng. M.C. Riyas
BSc Eng (Hons) (*PDN*), MEng (*Tokyo*), CEng, MIE (*SL*)

Head, Department of Computer Science & Engineering
Dr. W.G.C.W. Kumara
BSc Eng (Hons) (*RUH*), MEng (*AIT*), PhD (*NCU*), AMIE (*SL*)

Head, Department of Electrical and Telecommunication Engineering
Dr. P.M.K. Alahakoon
BSc Eng (Hons) (*PDN*), MS (*VT-USA*), PhD (*UMC-USA*)

Head, Department of Interdisciplinary Studies
Prof. M.A.L.A. Haleem
BSc Eng (Hons) (*PDN*), MPhil (*HKUST*), PhD (*SIT-USA*), AMIE (*SL*), SM-IEEE (*USA*)

Head, Department of Mechanical Engineering
Prof. A. M. Muzathik
BSc Eng (Hons) (*MRT*), MEng (*MRT*), PhD (*UMT*), CEng, CMarSci, MIE (*SL*), MIAE (*SL*), FIMarEST (*UK*)

Senior Assistant Registrar, Faculty of Engineering
Mr. M.H. Nafar
BBA (Hons) (*SEUSL*), PGDPM (*SLIDA*)

Office of the Dean

Dean
Dr. S.M. Junaideen
BSc Eng (Hons) (*PDN*), MPhil (*HKU*), PhD (*HKU*), CEng, MIE (*SL*)

Senior Assistant Registrar
Mr. M.H. Nafar
BBA (Hons) (*SEUSL*), PGDPM (*SLIDA*)

Office Staff
Mr. M.I. Abdul Jaleel HNDA (*SL*) (Management Assistant)
Ms. M.F. Shifana (Management Assistant)
Mr. I.L.M. Nilamudeen
Mr. A.J. Abdul Razak

2.4 Department of Civil Engineering

The Department of Civil Engineering is the largest department in the Faculty of Engineering, absorbing more than 50% of students from the faculty annual intake. The academic staff members of the department have diverse academic and industry backgrounds and international exposure. The department offers the specialization programme leading to the *Honours Degree of Bachelor of the Science of Engineering in Civil Engineering*.

The Civil Engineering degree programme has a comprehensive curriculum covering a wide range of subjects in the areas of materials engineering, structural engineering, engineering geology, geotechnical engineering, surveying, highway and traffic engineering, water and environmental engineering, construction engineering, project management etc. The programme offers flexibility for students to choose elective modules of their choice in their final year of studies, complying with the overall credit requirements. Moreover, research projects, comprehensive design projects, field visits, field classes, survey camp, industrial training, and design classes are important constituents of the curriculum. The curriculum contents are continually updated in line with the changes in the educational spheres and requirements of the profession.

The department is housed in a four-storied building complex with modern laboratories, computer facilities, auditorium, lecture halls, office areas and workplaces for academic, administrative and technical staff, examination hall, and other shared facilities for students. The learning environment in the department enables students to familiarize with state of the art facilities, technologies and practices. The department has the following laboratories with specialized facilities for teaching, research, and consultancy works.

1. Materials Laboratory
2. Hydraulic Engineering Laboratory
3. Environmental Engineering Laboratory
4. Geotechnical Engineering Laboratory
5. Traffic and Highway Engineering Laboratory
6. Survey Laboratory
7. Computer Laboratory

Head of the Department:

Eng. M.C. Riyas
BSc Eng (Hons) (*PDN*), MEng (*Tokyo*), CEng, MIE (*SL*)

Academic Staff

Eng. M.I. Ilham Jazeel
BSc Eng (Hons) (*PDN*), MEng (*MRT*), CEng, MIE (*SL*)
Senior Lecturer

Dr. S.M. Junaideen
BSc Eng (Hons) (*PDN*), MPhil (*HKU*), PhD (*HKU*), CEng, MIE (*SL*)
Senior Lecturer

Dr. J. Ajith Thamboo
BSc Eng (Hons) (*PDN*), PhD (*QUT*), AMIE (*SL*), MIMS (*UK*)
Senior Lecturer

Eng. A.L.M. Risath
BSc Eng (Hons) (*PDN*), MSc Eng (*MRT*), AMIE (*SL*)
Senior Lecturer

Dr. J.A. Shiran Pradeep Jayakody
BSc Eng (Hons) (*MRT*), PhD (*QUT*), AMIE (SL), APES (*SG*)
Senior Lecturer

Eng. M.C. Riyas
BSc Eng (Hons) (*PDN*), MEng (*Tokyo*), CEng, MIE (*SL*)
Senior Lecturer

Dr. K. Vijayakanthan
BSc Eng (Hons) (*PDN*), MEng (*TIT*), PhD (*TIT*), AMIE (*SL*)
Lecturer

Eng. A.C.A. Suja
BSc Eng (Hons) (*MRT*), MPhil *(MRT) (Pursuing)*, AMIE (*SL*)
Lecturer (Prob.)

Eng. T. Jayakaran
BSc Eng (Hons) (*PDN*), MSc Eng (*PDN*), AMIE (*SL*)
Lecturer (Prob.)

Eng. S. Tharshika
BSc Eng (Hons) (*SEUSL*) AMIE (*SL*)
Lecturer (Prob.)

Eng. M.F.M. Ishqy
BSc Eng (Hons) (*RUH*), AMIE (*SL*)
Lecturer (Prob.)

Prof. S.B. Weerakoon
BSc Eng (Hons) (*PDN*), MEng (*Tokyo*), PhD (*Tokyo*), CEng, FIE (*SL*)
Senior Professor on sabbatical

Non-Academic Staff

Mr. M.P. Samsudeen (Management Assistant)
Mr. S.M.M. Jiffry (Technical Officer)
Mr. I.V. Numal Kaushala (Technical Officer)
Ms. A.F. Faroosa (Technical Officer)
Mr. I.L.M. Imthiyas
Mr. M.R.M. Sifan
Mr. I.L.M. Riskan
Mr. M.H.M. Farhan
Mr. R. Kathakaran

2.5 Department of Electrical and Telecommunication Engineering

The Department of Electrical and Telecommunication Engineering is one of the core departments of the Faculty of Engineering. Academic staff members of the department have expertise in diverse areas with international exposure. The department provides basic modules to all engineering students on the principles of electrical and electronic engineering during their first year of studies.

The department at present conducts the specialization programme leading to the *Honours Degree of Bachelor of the Science of Engineering in Electrical and Electronic Engineering* for up to 35% students from the annual intake. The degree programme is designed so that the undergraduates will possess multi-faceted talents which make them fully qualified for electrical power sector, power electronics, industrial automation, electronics and telecommunication engineering upon graduation.

The department is housed in a two storied building of the Faculty Main Building complex and has seven modern laboratories with state-of-the-art facilities:

1. Digital and Analogue Electronics Laboratory
2. High Voltage laboratory
3. Electrical Measurements Laboratory
4. Power System Laboratory
5. Telecommunication Laboratory
6. Machines and Drives Laboratory
7. Computing Laboratory

The laboratories have specialized arrangements for hands-on laboratory works, practical sessions of students and research works. The department is currently getting ready to set up an industry sponsored 5G Innovation Laboratory as a joint venture with telecommunication industries. The department is planning to do further expansion of laboratory facilities, conducting short courses for undergraduates and practicing engineers, conducting consultancy and collaborative research works with industry in the near future.

The department has a project space for students to carry out their project works more conveniently. A common study area is available inside the department premises with Wi-Fi facilities that students can optimize for learning activities. The department is arranging field visits, field courses and conducting guest lectures by industry specialists as being part of and not being part of the degree curriculum.

Head of the Department:

Dr. P.M.K. Alahakoon
BSc Eng (Hons) (*PDN*), MS (*VT-USA*), PhD (*UMC-USA*)
Senior Lecturer

Academic Staff:

Prof. M.A.L. Abdul Haleem
BSc Eng (Hons) (*PDN*), MPhil (*HKUST*), PhD (*SIT-USA*), AMIE (*SL*), SM-IEEE (*USA*)
Chair Professor

Dr. P.M.K. Alahakoon
BSc Eng (Hons) (*PDN*), MS (*VT-USA*), PhD (*UMC-USA*)
Senior Lecturer

Dr. A.M. Aslam Saja
BSc Eng (Hons) (*PDN*), MSc Eng (*PDN*), PhD (*QUT*), AMIE (*SL*)
Senior Lecturer

Eng. M.F.M. Abdul Cader
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Lecturer (Prob.)

Eng. M.H. Fayas Ahamed
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Lecturer (Prob.)

Eng. R. Hirshan
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Lecturer (Prob.)

Eng. M.H.M. Safnas Kariapper
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Eng. A.I.S. Juhaniya
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Lecturer (Prob.)

Eng. M.R.M. Rouzin Azar
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Lecturer (Prob.)

Eng. M.R.F. Razeeya
BSc Eng (Hons) (*RUH*) AMIE (*SL*)
Lecturer (Prob.)

Non-Academic Staff

Mr. M.A.A. Aazath Ali (Management Assistant)
Mr. V. Bavananthan (Staff Technical Officer)
Mrs. H.F. Farzana Begum Ismail (Technical Officer)
Mr. K. Kafeel Mohamed
Mr. M.T. Mohamed Rifais
Mr. A.H. Hamzath
Mr. A.R.M. Mansoor

2.6 Department of Mechanical Engineering

The Department of Mechanical Engineering is one of the pioneering departments of the Faculty of Engineering with vast range of modern laboratory equipment. The academic staff members of the department have expertise in diverse areas with international exposure. The department covers five of the modules in the common core programme offered to all engineering students, namely Applied Mechanics, Engineering Drawing, Engineering Materials and Processes, and Presentation of Engineering Information.

The Department of Mechanical Engineering conducts the specialization programme leading to the *Honours Degree of Bachelor of the Science of Engineering in Mechanical Engineering* for up to 25 % of students from the annual intake to the Faculty. The Mechanical Engineering curriculum covers a wide range of subjects in the areas of Energy Engineering, Manufacturing, Industrial Engineering, Thermo Fluids, Mechatronics, Building Services Engineering, and set of complementary modules in Management, Economics, Communications, Humanities, Social Sciences, Arts, and Professional Ethics. The department is also providing the technical elective modules under the categories of Energy Technology, Agricultural Engineering, Mechatronics and Building Services Engineering. Furthermore, research projects, design projects, field visits, industrial training, and design classes form important part of the curriculum.

The Department is housed in a separate building complex located 500 m away from the Faculty Main Building. The facilities in the building complex include Laboratories equipped with state-of-the-art equipment, Engineering Workshops, Computer facilities with high speed internet connectivity, Design office, Drawing office to accommodate up to 100 students, Lecture halls, Office areas and workplaces for staff and students. A common study area is available inside the department premises with Wi-Fi facilities for their online learning activities.

The laboratories listed below have customized arrangements for hands on laboratory and practical sessions of students, and specialized facilities for research works.

1. Applied Mechanics laboratory
2. CNC laboratory
3. Control & Mechatronics laboratory
4. Fluid machinery laboratory
5. HVAC and Refrigeration laboratory
6. Materials laboratory
7. Thermodynamics laboratory
8. Automobile laboratory
9. Manufacturing laboratory
10. Fluid Mechanics laboratory
11. Computing laboratory

Head of the Department

Prof. A. M. Muzathik
BSc Eng (Hons) (*MRT*), MEng (*MRT*), PhD (*UMT*), CEng, CMarSci, MIE (*SL*), MIAE (*SL*), FIMarEST (*UK*)
Professor

Academic Staff

Prof. A. M. Muzathik
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Professor

Dr. U. Farook
BSc Eng (Hons) (*MRT*), PhD (*UCL*), AMIE (*SL*), FIMMM (*UK*)
Senior Lecturer

Eng. Rehana. F. Munas
BSc Eng (Hons) (*PDN*), MPhil (*MRT*), AMIE (*SL*)
Senior Lecturer

Eng. I. Ahamed Abdullah
BSc Eng (Hons) (*MRT*), MEng (*Italy*), AMIE (*SL*)
Senior Lecturer

Eng. R.I. Soysa
BSc Eng (Hons) (*Monash*), MPhil (*Monash*)
Lecturer

Eng. P. Balthazar
BSc Eng (Hons) (*PDN*), MSc Eng (*USM*), AMIE (*SL*)
Lecturer (Prob.)

Eng. R. Ratheesan
BSc Eng (Hons) (*MRT*), AMIE (*SL*)
Lecturer (Prob.)

Eng. P.A.K.P. Indrajith
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Lecturer (Prob.)

Eng. A.V.N. Hussain
BSc Eng (Hons) (*SEUSL*), AMIE (*SL*)
Lecturer (Prob.)

Eng. S. Apilakshan
BSc Eng (Hons) (*SEUSL*), AMIE (*SL*)
Lecturer on contract

Non-Academic Staff

Mr. A.R. Ahamed Haseem (Management Assistant)
Mr. A.S. Hafee (Technical Officer)
Mr. A. Rasool (Technical Officer)
Mr. M.C. Sufeen
Mr. M.H. Hanizar
Mr. R. Nowzad
Mr. U.L.M. Yaseer
Mr. K.L.M. Aseem
Mr. M.P.M. Riyas

2.7 Department of Computer Science and Engineering

The Department of Computer Science and Engineering (DCSE) was established in the year 2012 together with the other departments of the Faculty. The department offers *Introduction Computing* to all engineering students during their first year of studies and a set of modules offered to other fields of specialization.

The department is located in the Faculty Main Building along with the Department of Electrical & Telecommunication Engineering. The facilities in the department include Computing Centre with 52 computers with internet connectivity, Computer Network Laboratory with 20 computers equipped Gigabit Ethernet switches and routers.

DCSE is planning to commence a separate field of specialization in computing. As part of the preparatory work for the new programme, the department has taken initiatives to establish three more laboratories with the support of the Department of Electrical and Telecommunication Engineering: Image Processing and Machine Learning Laboratory, Robotics Research Laboratory, and Advanced Automation Laboratory.

Besides its academic activities, DCSE is supporting the Faculty in the maintenance of the Learning Management System (LMS) and is overseeing installation of all system updates and upgrades. The department staff helps dealing with routine operation and configuration of LMS, and act as internal consultants recommending solutions to issues relating to system functionality and software systems.

Further, the department provides technical training to academic and non-academic staff on information technology infrastructure services. The Faculty has taken steps to streamline all the above activities under 'Network Systems and Operation Centre'. The Centre which is in the making will be functioning under the direction of DCSE.

Head of the Department

Dr. W.G.C.W. Kumara
BSc Eng (Hons) (*RUH*), MEng (*AIT*), PhD (*NCU*), AMIE (*SL*)

Academic Staff

Dr. W.G.C.W Kumara
BSc Eng (Hons) (*RUH*), MEng (*AIT*), PhD (*NCU*), AMIE (*SL*)
Senior Lecturer

Dr. M.N. Ajmal Hinas
BSc Eng (Hons) (*PDN*), PhD (*QUT*), AMIE (*SL*)
Senior Lecturer

Eng. A.L. Fathima Shanaz
BSc Eng (Hons) (*PDN*), MPhil (*PDN*), AMIE (*SL*)
Senior Lecturer

Eng. M.N.M. Aashiq
BSc Eng (Hons) (*PDN*), MSc (*Pursuing*), AMIE (*SL*)
Lecturer (Prob.)

Eng. N.T.M. Sajith
BSc Eng (Hons) (*PDN*), MSc (*PDN*), AMIE (*SL*)
Lecturer (Prob.)

Non-Academic Staff

Mr. I.M. Sakoor (Management Assistant)
Mr. K. Raisudeen (Technical Officer)
Mr. A.H. Hamthal (Laboratory attendant)
Mr. A. M. Aroos

2.8 Department of Interdisciplinary Studies

The Department of Interdisciplinary Studies was established together with the other departments in the Faculty of Engineering in order to provide students necessary core modules in mathematics and English language, and complementary modules in management, industrial law and regulatory provisions, engineering economics, professional ethics, communication skills, and other modules in humanities, social sciences and arts. Engineers are expected to perform multi-disciplinary roles in the industry, and the non-technical modules offered by the department complement the technical content of the respective engineering curriculum, and bridge the gaps in the students' knowledge, skills, and attitudes.

Students are required to take all the core modules offered by the department during the common core programme and specialization programme. The department offers flexibility for students to choose their elective modules depending on their field of specialization. The department designs and delivers the modules to engineering students with the support of academic staff from other departments of the Faculty, internal visiting staff from other faculties of the University, and visiting staff from other universities and industry. The inter-faculty academic staff members from the Department of English Language Teaching of the Faculty of Arts and Culture, Department of Mathematical Sciences of the Faculty of Applied Sciences, and the Departments of the Faculty of Management and Commerce have been providing remarkable supports to the Department of Interdisciplinary Studies to deliver the courses respectively in English language, mathematics, and management studies.

Head of the Department

Prof. M.A.L.A. Haleem
BSc Eng (Hons) (*PDN*), MPhil (*HKUST*), PhD (*SIT-USA*), AMIE (*SL*), SM-IEEE (*USA*)
Chair Professor

Academic Staff

Mr. K.M. Indunil Nishantha
BSc.Sp (Hons)(*PDN*)
Lecturer (Prob.)

Eng. N. Sulaxshan
BSc Eng (Hons)(*SEUSL*), AMIE (*SL*)
Lecturer (Prob.)

Non-Academic Staff

Mr. MACM Siraj (Senior Staff Management Assistant)
Mr. T. Jasmeen

2.9 Industrial Training and Career Guidance Center (ITCGC)

Industrial Training is a mandatory component of the engineering degree programme. Industrial Training and Career Guidance Centre (ITCGC) is responsible for arranging, monitoring, and evaluating the industrial training placements of the engineering students in liaison with the National Apprentice and Industrial Training Authority (NAITA) and the industry. ITCGC is also responsible for planning and organizing career guidance and professional activities for engineering students.

All engineering students should undergo industrial training programme after the second and third years of study over a period of twelve weeks duration in each placement, with a minimum total duration of 24 weeks. The work integrated learning provided to students through the industrial training enable them to gain valuable insights into contemporary professional practices complementing the courses offered at the Faculty.

ITCGC endeavours to place students in well-recognized organizations considering their fields of study and preferences. The centre conducts an orientation session to students before the placements to get them prepared for the training. The training activities provide students an early preparation for their professional engineer.

ITCGC Director:

Eng. M.I. Ilham Jazeel BSc Eng (Hons) *(PDN),* MEng *(MRT),* CEng, MIE *(SL)*

2.10 Engineering Workshops

The Engineering Workshops were established in the year 2014 alongside the laboratories of the Department of Mechanical Engineering. Even though the workshops are run separately, the functional arrangements and daily operations of the workshops are linked to the Department of Mechanical Engineering for administrative purposes. The Engineering Workshops consist of

1. Machine Workshop
2. Welding Workshop
3. Fitting Workshop
4. Sheet Metal Workshop
5. Carpentry Workshop
6. Electrical and Electronic Workshop and
7. Tools & Metal stores

The facilities in the workshops are utilized to conduct workshop / practical sessions to the first year students and Mechanical Engineering students in their 2nd and 3rd year of studies in the areas of engineering workshop and production technology. Moreover, the workshop resources are utilized for fabricating hardware components for teaching and research.

A team of qualified staff and supporting staff including craft demonstrators, machinists, welders, carpenters, electricians, fitters, sheet metal fabricators, technical officers, and work superintendent are working under the guidance of the Workshop Engineer.

Workshop Engineer

Eng. M.S.A. Sabry HND (Eng), BEng, Dip*(SLSI)*

Workshop Staff

Mr. J. Anaston Prasanna
Mr. M.A.M. Hibini
Mr. U.L. Mohamed Fareeth
Mr. S. Javees
Mr. I.L.M. Harees
Mr. V. Narendiren
Mr. A.M.M. Niyas
Mr. A.C.M. Irshad
Mr. A.M.M. Haroos
Mr. M.M. Nazar
Mr. A.R.M. Nafees
Mr. Y.G.T.L.T. Karunarathne
Mr. R.P.C. Priyashan Wijesinghe
Mr. M.M. Alkatheen
Mr. S.C.D.H.M.H.S.P. Hapukotuwa
Mr. M.M.M. Arafath
Mr. S. Jeyaraj
Mr. I.L. Rikkas

2.11 Internal Quality Assurance Cell (IQAC)

The Internal Quality Assurance Cell (IQAC) of the Faculty of Engineering was established as per the guidelines issued by the University Grants Commission to look after quality assurance activities of the Faculty in tandem with the Centre for Quality Assurance (CQA) of the University. IQAC reports to the Faculty Board about quality assurance and enhancement activities in the Faculty in conformity with the University Quality Assurance Policy.

The IQAC is made up of representatives from each department in the Faculty and administered by an academic nominated by the Faculty Board. IQAC regularly plans and monitors quality assurance activities, gives guidance on good practices among staff and students of the faculty, and reports the activities to the Faculty Board on a regular basis. The quality assurance mechanism and practice for teaching learning processes and student support in the departments are implemented under the direction of the IQAC. Further, the IQAC oversees activities of the quality assurance reviews and necessary follow-up actions.

IQAC Coordinator:
Eng. M.H. Fayas Ahamed BSc Eng (Hons) *(MRT),* MSc *(York),* AMIE *(SL)*

2.12 Engineering Consultancy Services (ECS)

Higher Education Institutes are required to broaden the services to the needs of wider spectrum of the society other than producing competent graduates. Engineering Consultancy Services (ECS) has been established in the Faculty in order to foster close collaboration with engineering stakeholders in the region. The Faculty has been receiving requests from industrial firms for consultancy works and the faculty has the capability to serve those needs via the academic departments and state of the art laboratory facilities.

The main functions of ECS are

- Consultancy: provides expert solutions, design support and consultancy services.
- Research: Undertake contract research projects. These research projects could be different from the routine problems and may need expert knowledge and innovative solutions.
- Education & Training: Conduct short courses, workshops and seminars to the Engineers and related professionals from the industry.

The Management Committee of ECS is consisting of the Dean of the Faculty, Heads of all the Departments in the Faculty, Workshop Engineer and a Management Assistant for administration works. The revenue generated from each project is being streamlined according to the Commission Circular No.04/2016 "Guidelines for use of funds generated from Self-Financing Activities (SFAs) in the University and Higher Education Institutes".

ECS is continuously acquiring and maintaining up-to-date literature on current design methodologies, standards, and design tools. ECS can undertake design, research & support, training and consultancy to support the needs of local industries.

ECS Director:

Eng. A.L.M. Risath BSc Eng (Hons) *(PDN),* MSc Eng *(MRT),* AMIE *(SL)*

3 PROGRAMME DETAILS

3.1 Admission

Admission requirements for the degree programme are determined by the UGC in accordance with the government policy on university admissions. The minimum requirements are passes in Combined Mathematics, Physics and Chemistry at the GCE Advanced Level Examination.

Applicants with foreign qualifications referred for admission by the UGC may be admitted only with the consent of the Faculty Board, subject to approval by the Senate.

3.2 Medium of Instruction

The medium of instruction of the degree programme is English.

3.3 Credits

The degree programme is offered on a Credit-unit or Credit System where each module/ component is assigned Credits to indicate its work load relative to the total work load under the degree programme. One Credit is equivalent to 15 hours of lectures or 30 hours of tutorial / assignment/ laboratory work / field work / design work. For other activities such as projects, training modules, camps, and course works, Credit values assigned are commensurate with the respective workloads.

3.4 Module Code

A particular module is denoted by an alpha-numeric code comprising two letters and four digits. The first two letters denote 'Module Discipline' viz:

CE: Civil Engineering
CS: Computer Science and Engineering
EE: Electrical & Electronic Engineering
ME: Mechanical Engineering
ID: Interdisciplinary studies

The first digit denotes 'Level of the Course' which varies from 1 to 5; Level 1 to 4: 1st Level to 4th Level Core Modules and Level 5: 5th Level Elective Modules (referring to either 'depth' in reference to technical elective modules or 'width' in reference to general elective modules). The second digit denotes 'Credit Value' of the module, and the last two digits denote 'Serial Number' (01 to 99) of the module from the particular area of discipline within each Level of the Course. For example:

CE1301 Mechanics of Materials

Serial Number '01' assigned from 'Civil Engineering' for Level 1
Credit Value
Level 1
Civil Engineering

A distinctive coding system is used for the Industrial Training; IT3301: First industrial training before or after the 3rd Year of Studies; IT4301: Second industrial training before or after the 4th Year of Studies

3.5 Grade Point Average

A student's academic achievement in modules taken is expressed as 'Grade Points' as presented in Section 7.2. 'Grade Point Average' (GPA) is a numerical measure of a student's academic achievement over a specified period of time. Each module attempted (including each failed module) is assigned a numerical value which is the product of grade points earned for the module and the credit value of that module. GPA is the sum of these numerical values divided by the total number of credits attempted:

$$GPA = \frac{\sum_i^n [(Module\ Grade\ Point)_i \times (Module\ Credit\ Value)_i]}{\sum_i^n (Module\ Credit\ Value)_i}$$

where '*n*' is the total number of modules offered over a specified period that are valid for the calculation of the GPA, and the GPA is rounded to the nearest second decimal place.

Semester Grade Point Average (SGPA) is the GPA in respect of modules attempted by a candidate (including failed modules) during a particular semester.

Current Grade Point Average (CGPA) is the GPA in respect of modules attempted by a candidate (including failed modules) at the time of calculation.

Overall Grade Point Average (OGPA) is the GPA in respect of modules attempted by a candidate (including failed modules) during a programme.

3.6 Programme Structure

The degree programmes are delivered only in full-time mode, comprising a pre-academic term, a common core programme of two semesters, a specialization programme of six semesters in respective engineering discipline, and industrial training placements, spanning altogether a period of four academic years as shown in Figure3.1.

3.6.1. Pre-academic Term

The pre-academic term brings fresh students with diverse backgrounds onto a common platform, creates social awareness, and prepares them for the academic programme. During the pre-academic term of four weeks, intensive English classes, orientation courses by various resource persons and site visits are conducted.

3.6.2. Common Core Programme

The common core programme includes the first two semesters with the total of 34 credits. During the common core programme, modules are offered in mathematics, computing, engineering drawing, and English language, and introductory engineering courses in civil, mechanical, electrical, electronic, and computer fields.

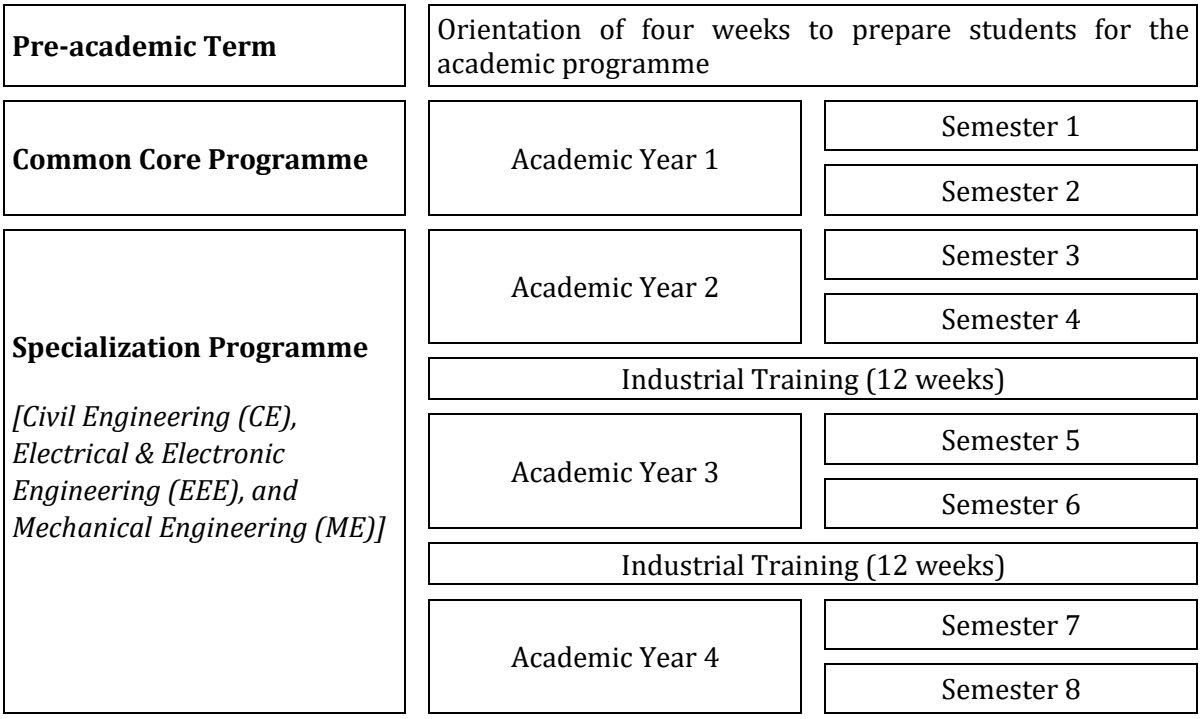

Figure 3.1. Programme Structure

3.6.3. Specialization Programme

Students are streamed into specializations from Semester 3 based on their performance in the core programme, their preference and available positions for each field of specialization. In the specialization programmes, students take core and elective modules offered by their respective Department, Department of Interdisciplinary Studies, and Department of Computer Science and Engineering. Certain modules have pre-requisites from previous semesters.

Core (C) modules must be followed by all the students in the field of specialization. Elective (E) modules must be chosen by students from the list of modules offered by the relevant department satisfying the overall credit requirements specified for the field of specialization.

3.7 Academic Calendar

The official academic calendar is announced prior to the commencement of each academic year which consists of two semesters, period of industrial training, any other periods allocated for projects / camps / training modules, and vacation. The minimum duration of industrial training is 24 weeks. An academic semester generally consists of:

Academic Activities (1st half)	: 8 weeks
Mid-Semester Vacation	: 1 week
Academic Activities (2nd half)	: 7 weeks
Study Leave & End of Semester Examination	: 3 weeks

4 COMMON CORE PROGRAMME

The Common Core Programme conducted in the first academic year is common for all students at the Faculty of Engineering. There are 12 Compulsory modules to be completed in the Common Core Programme (Tables 4.1). The modules are subject to change by the Faculty with the approval of the Senate.

Table 4.1 Common Core Programme Modules

	Module Code and Title		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 1	ID1301	Mathematics- I	3 C	38	14	-	30	70
	ID1202	English	2 C	-	60	-	50	50
	CS1301	Introduction to Computing	3 C	30	04	26	50	50
	EE1301	Principles of Electrical Engineering	3 C	35	10	10	30	70
	ME1301	Applied Mechanics	3 C	33	13	11	30	70
	ME1302	Engineering Drawing	3 C	23	-	44	50	50
		Total	17 C					

	Module Code and Title		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 2	ID1303	Mathematics- II	3 C	38	14	-	30	70
	ID1204	Communication Skills for Engineers	2 C	20	10	10	50	50
	CE1301	Mechanics of Materials	3 C	32	16	10	30	70
	EE1302	Principles of Electronic Engineering	3 C	35	10	10	30	70
	ME1303	Engineering Materials and Processes	3 C	26	-	38	50	50
	ME1304	Thermodynamics and Fluid Mechanics	3 C	33	11	13	30	70
		Total	17C					

4.1 Requirements to continue the Specialization Programme

A student should have satisfactorily followed the Common Core Programme, and should have got selected to a field of specialization to continue his / her studies. A student is deemed to have satisfactorily followed if he / she:

(a) has obtained 80% attendance in each module offered based on the total number of **equivalent lecture hours** of the module, and

(b) has sat for both End of Semester Examinations in Semester 1 and Semester 2, and has achieved OGPA ≥ 1.50 in the Common Core Programme.

4.2 Requirements for successful completion of the Common Core Programme

A minimum of OGPA of 2.00 in the Common Core Programme and grade in any of the modules is not below grade D; and completion of any other mandatory requirements prescribed by the Faculty.

4.3 Special Session

The Faculty may decide to conduct a Special Session after completion of the final evaluation of the modules in the Common Core Programme in each academic year.

4.3.1 Eligibility & Entitlement

(a) For a student to follow a module in the Special Session, he / she should have satisfactorily followed the same module when it was offered.

(b) A student who fails to complete the common core programme, shall be allowed to follow up to twelve credits in the special session subject to (a) above, provided that the grades accumulated by the student will potentially allow the student to successfully complete the common core programme.

(c) The maximum grade accruing to a student repeating a module shall be grade C.

(d) A student who has successfully completed the Common Core Programme in the same academic year and wishes to improve grades up to grade C, shall be allowed to register for up to a maximum of twelve credits subject to (a) above during the Special Session.

(e) A student who has not qualified in a module by the end of the Special Session will be required to follow the module in a subsequent semester in which the module is offered in order to qualify in that module.

4.3.2 Academic Concession

In case a student is eligible for an academic concession which may be given for medical reasons and other compelling reasons in accordance with Section 7.6, the following will apply:

(i) If the student is eligible for an academic concession for one or more modules of the Semester 1 and Semester 2, he/she can.

a) Request for approval from the Dean to follow the particular modules in the special session, provided that the grades accumulated will potentially allow him/her to successfully complete the common core programme. Approval may be granted by the Senate with the consent of the Faculty,

or

b) Request to sit the entire End of Semester Examinations with the next available intake of students as a first attempt candidate.

(ii) If the student is granted an academic concession for the entire First Year of Studies (Semester 1 and Semester 2), he/she shall join the next available intake of students entering the Faculty as a first attempt candidate.

In case a student has missed any part of Semester 1or Semester 2, but is not considered eligible for an academic concession, in accordance with Section 7.6, any modules missed will be considered as failed or incomplete in accordance with Section 7.2.

4.3.3 Registration

Students who are eligible to follow modules offered during the special session are required to register the modules during the period announced for registration at the beginning of the special session. No change to module registration is allowed after this period.

4.3.4 Maximum Allowed Duration

Notwithstanding the fact that he / she may otherwise be eligible, a student shall not follow any of the modules of the common core programme after a period of three academic years from the time of admission to the Faculty. However, a student may be permitted to follow any of the modules of the common core programme after a period of three academic years with special approval of the Senate granted on the recommendation of the Faculty.

5 SPECIALIZATION PROGRAMME

5.1 Fields of Specialization

The Faculty is at present offering the following fields of specialization viz Civil Engineering, Electrical & Electronic Engineering, and Mechanical Engineering. The fields of specialization are subject to change.

5.2 Selection to the Fields of Specialization

5.2.1. Admission to each field is limited and determined by the Senate on the recommendation of the Faculty based on the viability of providing facilities commensurate with quality standards.

5.2.2. While a place in at least one of the fields of specialization is assured for every student who successfully followed the Common Core Programme, it may not be possible to accommodate every student's first choice of field.

5.2.3. Streaming of a student into a field of specialization is based on available positions under different fields, and his/her preference and performance in the Common Core Programme.

5.2.4. In situations where the number of applicants for a field of specialization exceeds the number of places available in the Specialization Programme concerned, the places would be allocated based on the GPA obtained at his/her first attempt in the Common Core Programme modules [F-GPA] excluding the modules ID1202 English and ID1204 Communication Skills for Engineers.

5.2.5. In situations where two or more applicants with the same F-GPA compete for a vacancy of a particular field, the allocation of the field will be based on the performance in the modules, weighted as per credit rating, indicated against the field in question in Table 5.1.

Table 5.1 – Tie breaking modules for field selection

Field of Specialization	**Modules**
Civil Engineering	CE1301 Mechanics of Materials and ID1303 Mathematics-II
Electrical & Electronic Engineering	EE1301 Principles of Electrical Engineering, EE1302 Principles of Electronic Engineering, and ID1302 Mathematics-II
Mechanical Engineering	ME1301 Applied Mechanics, ME1304 Thermodynamics and Fluid Mechanics, and ID1302 Mathematics-II

5.2.6. Transfer from a field of specialization would be permitted only in case: when a student may be offered a placement in the field of a preferred choice due to a vacancy available therein. Such a transfer would only be permitted within two weeks of assigning the fields.

5.3 Academic Advisors

5.3.1. Academic Advisors will be appointed each academic year from among the members of the academic staff of the Faculty.

5.3.2. Students are required to consult and obtain the consent of his / her respective Academic Advisors prior to applying for registration at the beginning of each semester.

5.3.3. Students are also required to consult and obtain the Academic Advisors' consent prior to changing academic load after registration and obtaining leave from academic activities.

5.4 Academic Load

5.4.1. The academic load of a student (norm) in a semester differs depending on the specialization to which the student belongs. However, the total credit requirement in each semester varies typically between 17 and 22.

5.4.2. Irrespective of the norm, maximum credits a student could register for a semester is 28. Minimum requirement is 12 credits in a semester, however if a student deviates from the norm for a semester, it should be done with the consent of the Academic Advisors. This limit is considered for Dean's list, Scholarships, etc.

5.4.3. The credits per module are normally restricted to 1 to 3 credits, other than Comprehensive Design Project/Research Project, Training, Survey Camp or similar modules.

5.4.4. Student's Industrial training is considered a full-time commitment and assigned 6 credits.

5.4.5. Students are required to register for modules to satisfy normal academic load specified by the respective Department of Study in any semester. However, with the consent of the Academic Advisors, a student may be permitted to deviate from the norm within the specified credit limits. The additional modules may include the previously taken modules repeated for purposes of passing or upgrading of final grade.

5.5 Registration

5.5.1. Before the commencement of each Academic Year students are required to complete a registration form and pay any fees as may be required by the University and maintain registration during the period of study.

5.5.2. Students are required to register for modules with the Faculty for each semester in consultation with Academic Advisors.

5.5.3. Once the module registration period is over, the Dean's Office will send the relevant Department of Study the initial module registration details to be displayed on the notice board.

5.5.4. At the commencement of the semester, two weeks of Add/Drop period will be given for students to do necessary changes to their initial module registrations as per Section 5.6.

5.5.5. The Dean's Office will send the final module registration details to the Departments after Add/Drop period for confirmation by the students.

5.5.6. In situations, where the number of applicants for an Elective module is more than the number of places available, such places as would be allocated on the basis of the Current Grade Point Average (CGPA) of the applicants or any other suitable criteria approved by the Faculty and the field of specialization of the applicants until all places are filled. In case when registration for a module is not possible, the student is expected to register for alternative module(s).

5.5.7. A student repeating End of Semester Examination (ESE) or Continuous Assessment (CA) of a module is required to complete the registration prior to the end of the Add/Drop period of the respective semester, and if necessary, register for the academic year.

5.5.8. Each student is responsible for the completeness and accuracy of his/her module registration and for registering prior to the set deadlines.

5.5.9. It is also the responsibility of the student to plan and select the modules as may be required to satisfy graduation requirements.

5.5.10. A student who has successfully completed the graduation requirements set out in Section 8.2 will not be permitted to register for any new module(s). However, upgrading of modules up to a grade C as per Section 7.2.3 in the next available module examination may be permitted on written application by the student.

5.6 Changes to Module Registration

5.6.1. A student who wishes to de-register from a module should do so within the Add/Drop period of that semester with the consent of the Academic Advisors.

5.6.2. De-registration of compulsory modules, even during the Add/Drop period, will be allowed only under exceptional circumstances and should be approved by the Senate on the recommendation of the Head of the Department and the Dean of Faculty of Engineering. Such compulsory modules must be subsequently completed in order to be eligible for the award of the degree.

5.6.3. Discontinuing a module after the Add/Drop period will not be allowed and will be considered as an attempt, even if the student does not face any assessments and/or examinations in that module.

5.6.4. A student who wishes to take an additional module or a replacement for a de-registered module may do so within the Add/Drop period of the semester. In either case, the consent of the Academic Advisors would be required for the change. Under exceptional circumstances, late registration may be permitted by the Faculty, with the concurrence of the Lecturer in Charge of the module and the Head of the relevant Department of Study.

5.7 Withdrawal of a Module Registration

5.7.1. A student can request to withdraw from a module after the Add/Drop period under the following conditions.

i. The relevant Academic Advisor and the Head of the Department should recommend the request;

ii. Requests for withdrawal will not be entertained for compulsory modules and modules for which registration was done on competitive basis;

iii. Withdrawn modules will appear in the Academic Transcript as "Withdrawn";

iv. Withdrawal requests should be made before the last day of classes of the relevant semester;

v. Module(s) cannot be added in place of the withdrawn module(s);

vi. If a student later decides to register for a withdrawn module, he/she will be considered as a repeat candidate with an F grade for that module; and

vii. The grade is not counted in the calculation of the SGPA.

5.7.2. Requests for withdrawal should be approved by the Senate on the recommendation of the Head of the Department and the Dean of the Faculty of Engineering

5.8 Leave from Academic Activities

5.8.1. The following two categories of leave from academic activities are available to students: (a) Leave for Long Durations and (b) Leave for Short Durations, complying with the conditions specified in Sections 5.8.2 to 5.8.8.

5.8.2. Leave for Long Duration: A student may apply for this category of leave, when he/she has to be away from academic work for a long period due to medical reasons or circumstances deserving compassionate consideration. The duration of leave a student could apply under this category is a combination of full academic semesters to the maximum limit of one academic year.

5.8.3. Leave for Short Duration: A student may apply for this category of leave, when he/she has to be away from academic work for a short period for compelling reasons including but not limited to conferences, competitions, sports, community services, company start-ups, family commitments and medical grounds. Maximum duration of leave a student could obtain under this category is 15 working days per normal semester (Refer Section 3.7). It is the student's responsibility to consult the respective examiners in order to make sure that the leave obtained does not affect any of his/her CA or other mandatory evaluation requirements.

5.8.4. In case of a student traveling abroad, the Vice-Chancellor upon the recommendation of the Senate may grant leave.

5.8.5. Any approved Leave of Long Duration will be a part of the course period for the completion of the Degree.

5.8.6. Only Leave for Long Duration granted under medical grounds will add-on to the maximum period for the purpose of awarding class honours and the maximum period for the completion of the Degree.

5.8.7. Under exceptional circumstances, the Vice-Chancellor upon the recommendation of the Senate may grant Leave for Long Duration for circumstances beyond the provisions of Section 5.8.2. The Senate may also recommend the period of leave granted be added-on to the maximum period for the completion of the Degree.

5.8.8. All leave which fall during End of Semester Examinations will be granted according to by-law governing the conduct of examinations; and the student shall apply separately for the same following the guidelines therein.

5.9 Industrial Training

5.9.1. All students should undergo the training programme normally after the second and third years of study over a period of 12 weeks duration each time. A distinctive coding system is used for the Industrial Training; IT3301: First industrial training before or after the 3rd Year of Studies; IT4301: Second industrial training before or after the 4th Year of Studies.

5.9.2. Students should successfully complete the following to fulfil the training requirement for the award of the degree: (i) Undergo full time training in the industry for the prescribed period, (ii) Maintain a "Daily Diary", (iii) Submit the Employers reports, (iv) Submit a Training Report on completion of training acceptable to the faculty, (v) Obtain a minimum Grade of C in the training assessment including a Viva conducted by a "panel of examiners" appointed by the faculty.

5.9.3. All the details related to industrial training (eligibility, placement, assessment etc.) can be found in 'Guidelines for Industrial Training' issued by the Industrial Training and Career Guidance Centre of the Faculty

5.10 Civil Engineering Curriculum

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 3	ID2301	Differential Equations	3 C	38	14	-	30	70
	CE2301	Construction Materials	3 C	36	08	10	30	70
	CE2302	Structural Analysis	3 C	36	18	-	30	70
	CE2303	Geomechanics I	3 C	33	16	08	30	70
	CE2304	Fluid Mechanics	3 C	37	08	08	30	70
	CE2305	Engineering Surveying I	3 C	31	10	18	50	50
		Module from ID electives (Basket A)	1 E					
		Total	18 C+1 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 4	ID2302	Probability and Statistics for Engineers	3 C	38	14	-	30	70
	ID2303	Industrial Management I	3 C	38	14	-	30	70
	CE2306	Design of Structures I	3 C	37	16	-	40	60
	CE2307	Geomechanics II	3 C	35	10	10	30	70
	CE2308	Civil Engineering Construction	3 C	33	16	08	30	70
	CE2309	Engineering Hydrology	3 C	37	08	08	30	70
		Module from ID electives (Basket B)	2 E					
		Total	18 C+2 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	IT3301	Industrial Training I	3 C	-	-	-	100	-

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 5	ID3301	Complex Analysis and Numerical Methods	3 C	32	12	14	30	70
	CE3301	Design of Structures II	3 C	30	30	-	40	60
	CE3302	Geotechnical Engineering	3 C	37	16	-	30	70
	CE3303	Hydraulic Engineering	3 C	38	06	08	30	70
	CE3304	Highway Design and Traffic Engineering I	3 C	34	12	10	30	70
	CE3305	Engineering Surveying II	3 C	35	10	10	30	70
	CE3106	Survey Camp	1 C	-	-	90	100	
	CE3307	Environmental Engineering	3 C	39	08	04	30	70
		Module from ID electives (Basket A)	1 E					
		Total	22 C+1 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 6	ID3302	Industrial Management II	3 C	38	14	-	30	70
	CE3308	Construction Management	3 C	35	20	-	30	70
	CE3309	Geotechnical Engineering Design	3 C	36	16	02	40	60
	CE3310	Hydraulic Design	3 C	27	04	32	40	60
	CE3311	Highway Design and Traffic Engineering II	3 C	35	06	14	30	70
	CE3312	Water and Wastewater Engineering	3 C	36	08	10	40	60
	CE3313	Finite Element Methods	3 C	36	08	10	30	70
		Module from ID electives (Basket B)	2 E					
		Total	21 C+2 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	IT4301	Industrial Training II	3 C	-	-	-	100	-

Semester 7	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	ID4301	Project Management	3 C	34	10	12	30	70
	ID4202	Engineer in Society	2 C	26	08	-	30	70
	CE4402	Comprehensive Design Project	2 C*	10			100	-
	CE4603	Research Project	2 C**	10			100	-
		Module from ID electives (Basket A)	1 E					
		CE Electives	6 E					
		Other Electives						
		Total	9 C+ 7 E					

Semester 8	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	ID4203	Entrepreneurship and Intellectual Property	2 C	27	06	-	30	70
	CE4402	Comprehensive Design Project	2 C*				100	-
	CE4603	Research Project	4 C**				100	-
		Module from ID electives (Basket B)	2 E					
		CE Electives	5 E					
		Other Electives						
		Total	8 C + 7 E					

* 4-Credit Module spanning over Semester 7 (2 Credits) and Semester 8 (2 Credits)
** 6-Credit Module spanning over Semester 7 (2 Credits) and Semester 8 (4 Credits)

ID Electives	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	Basket A (Semester 3/5/7)							
	ID5101	Introduction to English Literature	1 E	13	04	-	30	70
	ID5102	Poetry and Short Stories	1 E	13	04	-	30	70
	ID5103	English Novels	1 E	13	04	-	30	70
	Basket B (Semester 4/6/8)							
	ID5211	Climate Change	2 E	24	06	06	30	70
	ID5212	Disaster Management	2 E	24	06	06	30	70
	ID5213	Psychology for Life	2 E	25	10	-	30	70
	ID5214	Ethnic Cohesion and Peace Building	2 E	23	08	06	40	60

CE Electives	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	Water Resources and Environmental Engineering							
	CE5201	Coastal Engineering and Coastal Zone Management	2 E	26	08		30	70
	CE5202	Water Resources Engineering	2 E	22	04	12	40	60
	CE5203	Irrigation Engineering	2 E	25	08	02	40	60
	CE5304	Advanced Water and Wastewater Treatment	3 E	33	24	-	40	60
	CE5305	Environmental Management	3 E	36	18	-	30	70
	Transportation Engineering							
	CE5211	Transportation Planning	2 E	24	4	8	30	70
	CE5212	Highway Construction and Maintenance	2 E	23	4	10	30	70

CE Electives (contd.)	Module Code and Name	GPA	L	T	P	Evaluation (%)	
		Credits	(h)	(h)	(h)	CA	Exam
	Structural Engineering						
	CE5221 Bridge Engineering	2 E	22	16	-	40	60
	CE5322 Advanced Structural Design	3 E	30	30	-	40	60
	CE5223 Computer Based Structural Analysis	2 E	22	16		50	50
	CE5324 Advanced Mechanics of Materials	3 E	36	18	-	30	70
	Geotechnical Engineering						
	CE5331 Ground Improvement techniques	3 E	35	20	-	40	60

Other Electives	Module Code and Name	GPA	L	T	P	Evaluation (%)	
		Credits	(h)	(h)	(h)	CA	Exam
	ME4304 Building Services Engineering	3 E	38	04	10	30	70
	CS5302 Machine Learning	3 E	30	-	30	50	50
	CS5303 Data Science for Engineers	3 E	30	-	30	50	50

Credit Requirements for the Civil Engineering Field of Specialization

Programme	Common Core Programme		Specialization Programme								Minimum Credits Required
Semester	**1**	**2**	**3**	**4**		**5**	**6**		**7**	**8**	
Common Core Subjects	12	12			Industrial Training			Industrial Training			24
ID Core Subjects	5	5									10
Specialization Core Subjects			15	12		19	18		-	-	64
Specialization Electives			-	-		-	-		29^		5*
Specialization Projects			-	-		-	-		4	6	10
ID Core Subjects			3	6		3	3		5	2	22
ID Electives			3 (Basket A - in Semesters 3/5/7)# + 6 (Basket B - in Semesters 4/6/8)#								3*
CS / ME Electives									9^		
Minimum GPA Credit requirement	17	17	18	18		22	21		12	12	
Minimum Non-GPA Credit Requirement					3			3			6
Total GPA Credit Requirement											144
Total Minimum Credit Requirement											150

*At least one module shall be taken from each basket.*

***** *Minimum 14 credits shall be earned from Specialization Electives, and ID/CS/ME Electives.*

^ *The respective department will announce the modules to be offered in a particular semester based on the availability of resource persons and number of students registering to follow the modules.*

5.11 Electrical and Electronic Engineering Curriculum

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 3	ID2301	Differential Equations	3 C	38	14	-	30	70
	EE2201	Electromagnetics	2 C	30	-	-	30	70
	EE2202	Electrical Circuit Analysis	2 C	29	-	02	30	70
	EE2203	Electrical Measurements	2 C	26	-	08	30	70
	EE2304	Digital Electronics	3 C	39	06	06	30	70
	EE2305	Introduction to Telecommunications	3 C	39	06	06	30	70
	EE2306	Theory of Electricity	3 C	39	06	06	30	70
		Module from ID Electives (Basket A)	1 E					
		Total	18 C+1 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 4	ID2302	Probability and Statistics for Engineers	3 C	38	14	-	30	70
	ID2303	Industrial Management I	3 C	38	14	-	30	70
	CS2302	Computer Architecture	3 C	30	-	30	50	50
	EE2307	Introduction to Electrical Machines and Power Systems	3 C	39	06	06	30	70
	EE2308	Analogue Electronics	3 C	39	06	06	30	70
	EE2309	Signals and Systems	3 C	39	06	06	30	70
		Module from ID Electives (Basket B)	2 E					
		Total	18 C+2 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	IT3301	Industrial Training I	3 C	-	-	-	100	-

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	**(h)**	**(h)**	**(h)**	**CA**	**Exam**
Semester 5	ID3301	Complex Analysis and Numerical Methods	3 C	32	12	14	30	70
	CS3301	Computer Networks	3 C	30	03	27	50	50
	EE3301	Power Systems I	3 C	39	06	06	30	70
	EE3302	Communication Theory	3 C	39	06	06	30	70
	EE3303	Power Electronics	3 C	39	06	06	30	70
	EE3204	Applied Electromagnetics	2 C	24	-	12	30	70
		Module from ID Electives (Basket A)	1 E				30	70
		Total	17 C+1 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 6	ID3302	Industrial Management II	3 C	38	14	-	30	70
	CS3302	Data Structures and Algorithms	3 C	30	05	25	50	50
	EE3305	Communication Systems I	3 C	39	06	06	30	70
	EE3306	Control Systems	3 C	38	-	14	20	80
	EE3307	Electrical Installations	3 C	39	06	06	40	60
	EE3308	Electrical Machines and Drives I	3 C	35	10	10	30	70
		Module from ID Electives (Basket B)	2 E					
		Total	18 C+2 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	IT4301	Industrial Training II	3 C	-	-	-	100	-

Semester 7	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	ID4301	Project Management	3 C	34	10	12	30	70
	ID4202	Engineer in Society	2 C	26	08		30	70
	EE4301	Robotics	3 C	35	10	10	30	70
	EE4302	Power Systems II	3 C	34	10	12	30	70
	EE4403	Final Year Project (Part I)	4 C	10			100	
		Module from ID Electives (Basket A)	1 E					
		Module from CS Electives	3 E					
		Module from EE Electives	2 E					
		Total	15 C+6 E					

Semester 8	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	ID4203	Entrepreneurship and Intellectual Property	2 C	27	06	-	30	70
	ID4204	Industrial Law	2 C	27	06	-	30	70
	EE4304	Communication Systems II	3 C	35	10	10	30	70
	EE4305	Mechatronic Applications	3 C	35	10	10	30	70
	EE4406	Final Year Project (Part II)	4 C	10			100	
		Module from ID Electives (Basket B)	2 E					
		Module from EE / ME Electives	2 E					
		Total	14 C+4 E					

ID Electives	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	Basket A (Semesters 3/5/7)							
	ID5101	Introduction to English Literature	1 E	13	04	-	30	70
	ID5102	Poetry and Short Stories	1 E	13	04	-	30	70
	ID5103	English Novels	1 E	13	04	-	30	70
	Basket B (Semesters 4/6/8)							
	ID5211	Climate Change	2 E	24	06	06	30	70
	ID5212	Disaster Management	2 E	24	06	06	30	70
	ID5213	Psychology for Life	2 E	25	10	-	30	70
	ID5214	Ethnic Cohesion and Peace Building	2 E	23	08	06	40	60

EE Electives	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	Semesters 7/8							
	EE5201	Energy Studies	2 E	30	-	-	30	70
	EE5202	High Voltage Engineering	2 E	27	-	06	30	70
	EE5203	Electrical Machines and Drives II	2 E	30	-	-	30	70
	EE5204	Electronic Instrumentation	2 E	30	-	-	30	70
	EE5205	Industrial Electronics	2 E	30	-	-	30	70
	EE5206	Digital System Design	2 E	30	-	-	30	70
	EE5207	Digital Communications	2 E	26	4	4	30	70
	EE5208	Digital Image Processing	2 E	15		30	50	50

CS / ME Electives	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	CS5301	Operating Systems	3 E	30	04	26	50	50
	CS5302	Machine Learning	3 E	30	-	30	50	50
	CS5303	Data Science for Engineers	3 E	30	-	30	50	50
	ME4304	Building Services Engineering	3 E	38	04	10	30	70

Credit Requirements for the Electrical and Electronic Engineering Field of Specialization										
Programme	**Common Core Programme**		**Specialization Programme**							**Minimum Credits Required**
Semester	**1**	**2**	**3**	**4**	Industrial Training	**5**	**6**	Industrial Training	**7**	**8**	
Common Core Subjects	12	12									24
ID Core Subjects	5	5									10
Specialization Core Subjects			15	12		14	15		6	6	68
Specialization Electives			-	-		-	-		16^		4*
Specialization Projects			-	-		-	-		4	4	8
ID Core Subjects			3	6		3	3		5	4	24
ID Electives			3 (Basket A - in Semesters 3/5/7)# + 6 (Basket B - in Semesters 4/6/8)#								3*
CS /ME Electives			-	-	-	-	-	-	12^		3*
Minimum GPA Credit Requirement	17	17	18	18		17	18		15	14	
Minimum Non-GPA Credit Requirement					3			3			6
Total GPA Credit Requirement											144
Total Minimum Credit Requirement											150

*At least one module shall be taken from each basket.*

***** *Minimum 10 credits shall be earned from Specialization Electives, and ID/CS/ME Electives.*

^ *The respective department will announce the modules to be offered in a particular semester based on the availability of resource persons and number of students registering to follow the modules.*

5.12 Mechanical Engineering Curriculum

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 3	ID2301	Differential Equations	3 C	38	14	-	30	70
	CS2301	Computer Programming	3 C	30	-	30	30	70
	EE2210	Electronics for Mechanical Engineers	2 C	27	-	06	30	70
	ME2301	Fluid Mechanics	3 C	31	16	12	30	70
	ME2302	Mechanics of Machines	3 C	30	21	09	30	70
	ME2303	Mechanics of Materials	3 C	32	14	12	30	70
	ME2304	Applied Thermodynamics	3 C	30	15	15	30	70
		Module from ID Elective (Basket A)	1 E					
		Total	20 C + 1 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 4	ID2302	Probability and Statistics for Engineers	3 C	38	14	-	30	70
	ID2303	Industrial Management I	3 C	38	14	-	30	70
	EE2307	Introduction to Electrical Machines and Power Systems	3 C	39	06	06	30	70
	ME2305	Basic Controls and Instrumentation	3 C	30	15	15	30	70
	ME2306	Design of Machine Elements	3 C	30	-	30	30	70
	ME2307	Manufacturing Engineering	3 C	32	11	15	30	70
		Module from ID Elective (Basket B)	2 E					
		Total	18 C + 2 E					

	Module Code and Name		NGPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	IT3301	Industrial Training I	3 C	-	-	-	100	-

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 5	ID3301	Complex Analysis and Numerical Methods	3 C	32	12	14	30	70
	EE3209	Industrial Electronics for Mechanical Engineers	2 C	27	-	6	30	70
	ME3301	Fluid Machinery	3 C	30	12	18	30	70
	ME3302	Heating Ventilation Air- Conditioning and Refrigeration	3 C	30	18	12	30	70
	ME3203	Machine Dynamics	2 C	22	09	07	30	70
	ME3204	Operational Research	2 C	23	14	-	30	70
	ME3305	Mechanical Engineering Design I	3 C	25	10	30	30	70
		Module from ID Elective (Basket A)	1 E					
		Total	18 C + 1 E					

	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
Semester 6	ID3302	Industrial Management II	3 C	38	14	-	30	70
	ME3306	Automobile Engineering and Automotive Technology	3 C	36		18	30	70
	ME3307	Production and Operations Management	3 C	35	20	-	30	70
	ME3308	Mechanical Engineering Design II	3 C	10	10	60	70	30
	ME3309	Mechatronics	3 C	30	15	15	30	70
		Module from ID Elective (Basket B)	2 E					
		Specialisation Electives	2 E					
		Total	15 C + 4 E					

	Module Code and Name		NGPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	IT4301	Industrial Training II	3 C	-	-	-	100	-

Semester 7	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	ID4301	Project Management	3 C	34	10	12	30	70
	ID4202	Engineer in Society	2 C	26	08	-	30	70
	ME4201	Human Factors Engineering	2 C	20	08	12	30	70
	ME4402	Final Year Project - Part I	4 C*	-	-	-	100	-
	ME4303	Maintenance Management	3 C	32	18	08	30	70
		Module from ID Elective (Basket A)	1 E					
		Specialisation Electives	3 E					
		Total	14 C + 4 E					

Semester 8	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	ID4203	Entrepreneurship and Intellectual Property	2 C	27	06			
	ID4204	Industrial Law	2 C	27	06		30	70
	ME4304	Building Services Engineering	3 C	30	30	-	30	70
	ME4405	Final Year Project – Part II	4 C*	-	-	-	100	-
		Module from ID Elective (Basket B)	2 E					
		Specialisation Electives	2 E					
		Total	11 C + 4 E					

ID Electives#	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	Basket A # (Semester 3/5/7)							
	ID5101	Introduction to English Literature	1 E	13	04	-	30	70
	ID5102	Poetry and Short Stories	1 E	13	04	-	30	70
	ID5103	English Novels	1 E	13	04	-	30	70
	Basket B # (Semester 4/6/8)							
	ID5211	Climate Change	2 E	24	06	06	30	70
	ID5212	Disaster Management	2 E	24	06	06	30	70
	ID5213	Psychology for Life	2 E	25	10	-	30	70
	ID5214	Ethnic Cohesion and Peace Building	2 E	23	08	06	40	60

Specialization Electives##	Module Code and Name		GPA	L	T	P	Evaluation (%)	
			Credits	(h)	(h)	(h)	CA	Exam
	Stream 1 - Thermo Fluids**							
	ME5301	Heat and Mass Transfer	3 E	30	15	15	30	70
	ME5302	Computational Fluid Dynamics	3 E	30	15	15	30	70
	ME5303	Fluid Power Systems	3 E	30	18	12	30	70
	Stream 2 - Energy Technology**							
	ME5211	Energy Sources	2 E	26	08	-	30	70
	ME5212	Energy Conservation	2 E	32	18	08	30	70
	ME5313	Renewable Energy Technologies	3 E	30	30	-	30	70
	ME5214	Environment and Sustainability	2 E	30	-	-	30	70
	ME5215	Furnace Engineering	2 E	26	08	-	30	70
	Stream 3 - Agricultural Engineering**							
	ME5321	Introduction to Agricultural	3 E	30	15	15	30	70
	ME5322	Agricultural Plant and Machinery	3 E	30	15	15	30	70
	ME5323	Postharvest Technology	3 E	30	15	15	30	70

Specialization Electives##	Module Code and Name		GPA Credits	L (h)	T (h)	P (h)	Evaluation (%) CA	Exam
	Stream 4 - Mechatronics**							
	ME5331	Robotics and Automation	3 E	33	12	15	30	70
	ME5332	Mathematical Modelling	3 E	38	06	08	30	70
	CS5302	Machine Learning	3 E	30	-	30	50	50
	Others**							
	ME5241	Computer Integrated Manufacturing	2 E	24	04	12	30	70
	CS5303	Data Science for Engineers	3 E	30	-	30	50	50
	***A total of 11 GPA Credits shall be taken from above four streams and others.*							

Credit Requirements for the Mechanical Engineering Field of Specialization

Programme	Common Core Programme		Specialization Programme								Minimum Credits Required
Semester	**1**	**2**	**3**	**4**		**5**	**6**		**7**	**8**	
Common Core Subjects	12	12			Industrial Training			Industrial Training			24
ID Core Subjects	5	5									10
Specialization Core Subjects			17	12		15	12		5	3	64
Specialization Electives			-	-		-	7^		35^		7*
Specialization Projects			-	-		-	-		4	4	8
ID Core Subjects			3	6		3	3		5	4	24
ID Electives			3 (Basket A - in Semesters 3/5/7)# + 6 (Basket B - in Semesters 4/6/8)#								3*
CS Electives			-	-	-	-	-	-	3^		
Minimum GPA Credit Requirement	17	17	20	18		18	15		14	11	
Minimum Non-GPA Credit Requirement					3			3			6
Total GPA Credit Requirement											144
Total Minimum Credit Requirement											150

 # At least one module shall be taken from each basket.

** Minimum 14 credits shall be earned from Specialization Electives, and ID / CS Electives.*

^ The respective department will announce the modules to be offered in a particular semester based on the availability of resource persons and number of students registering to follow the modules.

6 OUTLINE OF SYLLABI

6.1 Modules offered by Department of Civil Engineering

CE1301 Mechanics of Materials (3 Credits)

Learning Outcomes: 1. Identify the equilibrium and compatibility conditions within a deformable body by relating to stress and strain at points inside the body 2. Solve for stresses, stress resultants, strains and deformations using equilibrium and compatibility conditions together with the definitions of axial, bending and twisting actions 3. Recognize the state of stress and strain at a point and solve for stress and strain components in different directions for 2-D problems 4. Identify the basic instability of compression members and solve for associated critical loads

Course Contents: Stress and Strain, Mechanical Properties of Materials, Axial load, Torsion, Bending and Shear, Stress and Strain Transformation, Buckling of columns, Deflection of Beams

CE2301 Construction Materials (3 Credits)

Learning Outcomes: 1. Recognize that different construction materials have general and specific properties that will govern the selection criteria for construction 2. Practice selection criteria for construction materials based on availability, reusability, carbon foot print and sustainability 3. Relate the factors contributing to quality of concrete and to employ required tests and standards for the constituent materials and production process 4. Evaluate the possibility of using new materials in construction using appropriate testing

Course Contents: Introduction, Cements, Aggregates, Concrete production, Environmental Issues, steel, Masonry, Timber, Bituminous Materials, Other construction Materials, Sustainability in Selecting Construction Materials

CE2302 Structural Analysis (3 Credits)

Learning Outcomes: 1. Model a structure considering its joints, supports and loading conditions to perform simplified analysis of that structure 2. Identify statically determinate structures and analyse them to find stresses, stress resultants, strains and deflection 3. Identify the statically indeterminate structures and select and use appropriate conventional solution method to analyse them 4. Simplify large structures considering specific features of them and analyse for given loading

Course Contents: Idealization of a structure, Analysis of statically determinate structures, Influence Lines for Statically Determinate Structures, Deflections, Analysis of Statically Indeterminate Structures, Approximate analysis of statically indeterminate structures

CE2303 Geomechanics I (3 Credits)

Learning Outcomes: 1. Compute the fundamental properties of soils and rocks and classify soils using standard classification systems 2. Describe and determine the compaction characteristics of soils 3. Explain the principle of effective stress and

determine pore water pressure and total stresses in soils 4. Describe the formation of rocks and soils 5. Identify basic geological features and explain the geological history of a given area

Course Contents: Phase Relationships and physical properties of Soils, Classification and Characteristics of Soils, Compaction of Soils, Pore-Water Pressure, Total and Effective Stresses, The Earth, Rocks and Soil on the Earth, and Geology in Sri Lanka

CE2304 Fluid Mechanics (3 Credits)

Learning Outcomes: 1. Describe fluid flow fields using velocity, acceleration and flow patterns 2. Calculate forces and moments by internal flows and flow jets 3. Compute losses in pipe flows and design pipe networks 4. Plan and carry out physical model tests based on similarity 5. Select appropriate pumps for given applications

Course Contents: Kinematics of fluid flow, Control volume analysis, Pipe flow, Dimensional analysis, Hydraulic machines

CE2305 Engineering Surveying I (3 Credits)

Learning Outcomes: 1. Develop control and detailed engineering surveying for a given land-based project while demonstrating an understating of different surveying methods with modern surveying equipment 2. Develop a cross-sectional profile of a site giving due consideration to the accuracy of surveys and proper use of equipment 3. Interpret surveying data to assess the validity and the accuracy of surveying work while demonstrating the importance of accuracy and reliability of the data obtained 4. Set-up surveying work under different conditions, especially circular curves in roads and complex buildings giving due considerations to accuracy n orientation, and dimension

Course Contents: Linear Measurements, Vertical Control, Horizontal Control, Areas, Volumes and Earth-works, Setting-out

CE2306 Design of Structures I (3 Credits)

Learning Outcomes: 1. Demonstrate the development of structural design process and apply the limit state concepts in design 2. Use Codes of Practice to estimate the design actions in structures and analyse for effects at element level 3. Identify the classifications of structural steel, timber and masonry to choose appropriate grades for a particular design 4. Design steel, timber or masonry structural members using relevant standards 5. Employ connections and other detailing provisions of codes of practice to produce detailed drawings and specifications

Course Contents: Basis of Structural Design, Actions on Structures, Steel as a Structural Material, Ultimate Limit State Resistance of Cross sections, Ultimate Limit State resistance of Members, Design of Connections, Verification for Serviceability limit state, Detailing of Steel Structural Design, Introduction to Eurocode6 Design of masonry elements, Introduction to Eurocode5 Design of Timber Elements

CE2307 Geomechanics II (3 Credits)

Learning Outcomes: 1. Describe the flow of water through soil and estimate the flow using seepage theory 2. Estimate stresses in soil due to various loads 3. Estimate

compression and consolidation of clay and determine coefficient of consolidation of clay 4. Calculate the shear strength of soil and determine shear strength parameters of soil 5. Identify geological structures and determine properties of rock for engineering purposes

Course Contents: Permeability of soil, Seepage and flow-net, Stresses in soil mass, Consolidation, Shear strength of soils, Geological process on earth, Structural geology

CE2308 Civil Engineering Construction (3 Credits)

Learning Outcomes: 1. Identify the construction sequence of a given project and construction drawings 2. Prepare the bill of quantities of a given construction project based on the relevant standards 3. Formulate the construction planning sequence for a given construction project and use relevant computer aided tool to monitor the progress 4. Identify the appropriate construction equipment for various construction projects

Course Contents: Method of Construction, Introduction to Building Regulations, Construction Estimation, Construction Planning, Construction Equipment, Sustainable Construction Methods

CE2309 Engineering Hydrology (3 Credits)

Learning Outcomes: 1. Describe the dynamics of the hydrological cycle including the catchment hydrological processes 2. Use hydrologic statistics and frequency analysis techniques applied to stream flow time series, and to estimate probable floods for designs 3. Use unit hydrograph methods to derive stream flow hydrographs due to different catchment rainfall 4. Analyse groundwater flow for its utilization and management

Course Contents: Hydrologic cycle and hydrological processes, Stream flows and frequency analysis, Catchment rainfall-runoff modelling, Groundwater hydrology

CE3301 Design of Structures II (3 Credits)

Learning Outcomes: 1. Relate mechanical properties and durability characteristics of reinforced concrete to the properties of its constituents 2. Solve for the effects of actions at member level by considering code provisions for actions and assumptions of reinforced concrete 3. Use code provisions to find the resistances of reinforced concrete members and carry out design at member level 4. Use the code provisions for detailing of reinforcement and provide relevant drawings and specifications

Course Contents: Introduction to Design of reinforced concrete Structures, Structural Analysis, Bending, Shear, Torsion, Serviceability, Detailing, Particular Detailing Requirements, Design for Stability

CE3302 Geotechnical Engineering (3 Credits)

Learning Outcomes: 1. Plan and execute site investigation programmes to identify potential hazards geological compositions and geotechnical properties required for design purposes 2. Explain Coulomb's and Rankine earth pressure theories and estimate the earth pressure under limiting conditions 3. Estimate the bearing capacity of soils

using failure mechanism incorporating the effects of different parameters such as foundation depth size etc 4. Analyse the stability of natural and man-made slopes using the slope stability theories

Course Contents: Site Investigation and Geophysical Exploration, Lateral Earth Pressure, Bearing Capacity of Soils, Stability Analysis of Slopes

CE3303 Hydraulic Engineering (3 Credits)

Learning Outcomes: 1. Determine the transient pressures developed in pipes and analyse the design protection measures 2. Analyse steady, uniform and gradually varied open channel flows, and carry out flow measurements 3. Analyse and design unlined channels on erodible beds 4. Solve simple boundary layer flows using Navier-Stokes equations, explain approach to solve turbulent boundary layers flows and estimate drag forces 5. Apply wave theories to analyse coastal hydrodynamic processes and describe coastal protection methods

Course Contents: Hydraulic transients, Open channel flow, Boundary layer flows, Introduction to coastal engineering.

CE3304 Highway and Traffic Engineering I (3 Credits)

Learning Outcomes: 1. Apply traffic flow theory to understand, analyse and solve basic traffic phenomenon and incidences 2. Utilize models and theories to predict future demand on a given transportation system 3. Apply standard code of practices to conduct vertical and horizontal geometric design calculations of highways and to perform safety checks 4. Examine data from various sources to propose alternative corridors for a new road alignment and assess the LOS of a new or existing road

Course Contents: Traffic Flow Theory, Transportation Planning, Factor affecting Highway Design, Geometric Design, Highway Capacity Design.

CE3305 Engineering Surveying II (3 Credits)

Learning Outcomes: 1. Utilise surveying principles and tools in specialized surveying situations such as Geodetic surveying, hydrography, and underground tunneling 2. Determine through celestial observations by applying knowledge of spherical trigonometry to compute location on the planet and time giving due consideration movements of celestial bodies 3. Examine aerial and terrestrial photographs to interpret details from them to produce elements of a detailed map of the area 4. Apply principles of remote sensing and GIS to determine real-time surveying data from satellite imagery

Course Contents: Global Navigating Satellite system, Astronomical Surveying, Photogrammetry, GIS, Specialized surveying methods, Remote Sensing

CE3106 Survey Camp (3 Credits)

Learning Outcomes: 1. Plan an engineering survey to gather the information of ground features to implement an engineering project 2. Execute the fieldwork within the stipulated period using available resources giving due consideration to the accuracy, safety, site conditions, teamwork, and any other requirements 3. Process field survey data using software where available and produce maps, cross-sections, plans, and other

required output 4. Locate the planned structures or any other features on the maps, prepare the data required, and set them out in the field

Course Contents: Residential Camp for Fieldwork and Drawing Office Work.

CE3307 Environmental Engineering (3 Credits)

Learning Outcomes: 1. Describe the role of civil and environmental engineers and sustainability issues related to the infrastructure development and global environmental problems 2. Discuss the fundamentals of water, soil, air and noise pollution in relation to the environmental sustainability and their mitigation strategies and control technologies 3. Discern the physical, chemical and biological water quality characteristics along with the associated standards 4. Discuss the solid waste management issues by identifying different sources, composition and properties to apply engineering aspects of integrated Solid Waste Management (ISWM) strategies 5. Demonstrate the ability to work collaboratively in a team

Course Contents: Introduction to Environmental Engineering, Global Environmental Issues, Sustainable Development, Air and Noise Pollution, Water Quality and Pollution, Solid Waste Management

CE3308 Construction Management (3 Credits)

Learning Outcomes: 1. Discern construction plans for a project using computer tools 2. Conduct site management as a Junior Engineer at a construction site 3. Prepare a contract document for a construction project based on ICTAD and government guidelines 4. Plan a new construction site considering material storage, site offices, health and safety aspects and accommodation 5. Analyse routine management reports related to construction work 6. Execute work study in a construction site or in an office

Course Contents: Construction Planning, Work Study, Contract Administration, Management of Quality and Health and Safety, Site management

CE3309 Geotechnical Engineering Design (3 Credits)

Learning Outcomes: 1. Design appropriate shallow foundations and deep foundations for a given structure 2. Design suitable flexible and/or rigid earth retaining structures 3. Describe appropriate construction procedures for geotechnical structures 4. Analyse the stability of slopes using computer software and propose suitable remedial measures where necessary

Course Contents: Design of Shallow Foundations, Design of Deep Foundations, Design of Rigid and Flexible Retaining Structures, Design of Slopes (Use of Computer Software)

CE3310 Hydraulic Designs (3 Credits)

Learning Outcomes: 1. Identify the suitable types of structures required in a hydraulic system, and provide conceptual designs of hydraulic structures 2. Plan irrigation systems considering crop water requirements 3. Apply basic principles of hydrology and hydraulics to plan multipurpose reservoir considering demands for societal development and environment protection, and design of spillway and sluices 4. Design rubble-mound breakwaters for coastal protection using design manuals

Course Contents: Hydraulic structures, Irrigation engineering, Design of storage based water resources development project - Demand estimation, Design of storage based water resources development project - Design of multipurpose reservoir, Coastal structures

CE3311 Highway and Traffic Engineering II (3 Credits)

Learning Outcomes: 1. Apply macroscopic and microscopic traffic flow models to solve various simple traffic scenarios giving due consideration to data collection and accuracy 2. Design and use traffic tools and implements to meet the needs of intersections and road links giving due consideration to the code of practices and local conditions 3. Utilise standard specifications and tests to select aggregates and bitumen for flexible pavement construction 4. Design flexible pavement considering its volumetric properties and load-carrying capacity 5. Evaluate the concurrent developments and future trends in the traffic and transportation engineering field to appreciate the dynamic and interdisciplinary nature of the traffic and transportation engineering field

Course Contents: Applications of Traffic Flow Theory, Traffic tools and implements, Highway Materials, Pavement Analysis and Design, Urban Transportation, Concurrent Issues in Transportation

CE3312 Water and Wastewater Engineering (3 Credits)

Learning Outcomes: 1. Appraise water quality characteristics of water sources including: Groundwater, Aquifers, Surface Waters, Reservoir 2. Design a typical water treatment system with engineering and operational aspects of water treatment processes 3. Apply growth and substrate removal kinetics, and mass balance equation to secondary level biological treatment of wastewater 4. Design basic components of a wastewater treatment system with preliminary, primary and secondary level treatment with engineering and operational aspects of treatment processes 5. Analyse water quality and wastewater parameters in a laboratory following standard methods 6. Organize the work collaboratively in a team

Course Contents: Water Sources and Water Quality, Water Treatment Plant Capacity, Design of Water Treatment Plant Train, Wastewater Characteristics and Treatment, Design of Wastewater Treatment Plant, On-site Preliminary Treatment of Wastewater

CE3313 Finite Element Methods (3 Credits)

Learning Outcomes: 1. Discern the concept of finite element method 2. Determine the element stiffness matrix associated with relevant coordinate systems 3. Analyse simple of the plane Stress and plane Strain Stiffness Equations and related problems 4. Use general purpose finite element based computer software to analyse civil engineering problems

Course Contents: Introduction to Finite Element Methods, Introduction to Matrix Stiffness Method, Derivation of Element Stiffness Matrix for Beams and Frames, Development of the Plane Stress and Plane Strain Stiffness Equations, Axisymmetric Element Stiffness Matrix Formulations, Introduction to General Purpose FEM Computer Package

CE4402 Comprehensive Design Project (4 Credits)

Learning Outcomes: 1. Comprehend the given design problem and able to analyse possible conceptual solutions 2. Use the theory, design and practice in Civil Engineering for real engineering applications 3. Handle independently technical related matters in all stages of a Civil Engineering project 4. Solve the problem as a team as that in professional practice 5. Design the selected components in the project using the engineering principles learned 6. Generate project reports, design calculation, engineering drawings and engineer's estimates for a given project

Course Contents: Concept Stage, Feasibility Study, Environmental Impact Assessment (EIA), Preliminary Design Stage, Detailed Design Stage, Design output

CE4603 Research Project (6 Credits)

Learning Outcomes: 1. Describe the process of scientific research, techniques, and rationalization 2. Plan and organise a research project incorporating key components and reasonable timelines 3. Execute a research project by intelligently analysing a practical or conceptual problem and conclude in a scientific and logical manner 4. Research on a given problem using the fundamentals learned 5. Synthesises outcome developed through the research project 6. Demonstrate independent learning ability through research project presentation and report writing skills

Course Contents: Problem Identification and Project Formulation, Research Methods, Research Project Planning, Conduct of Research Project, Research Report Preparation and Defense

CE5201 Coastal Engineering and Coastal Zone Management (2 Credits)

Learning Outcomes: 1. Determine the characteristics of estuarine behaviour and determine the nearshore transformation processes 2. Apply wave theories to analyse coastal hydrodynamic processes and determine the statistical parameters related to random waves 3. Analyse coastal processes, plan coastal protections and harbour structures 4. Analyse issues in coastal zone in Sri Lanka and assess coastal zone management programmes

Course Contents: Coastal and estuarine hydraulics, Random waves and coastal water level fluctuations, Coastal and harbour structures, Coastal zone management in Sri Lanka

CE5202 Water Resources Engineering (2 Credits)

Learning Outcomes: 1. Derive design storms, flood flows and low flows of different return periods 2. Apply hydrologic & hydrodynamic models for computing flood inundations 3. Plan flood mitigation strategies in a river basin 4. Investigate river morphology changes and river bank erosions, and plan remedial measures 5. Assess the hydro power potential and develop suitable layout of hydro power scheme

Course Contents: Urban storm drainage, Flood modelling, Flood mitigation, River engineering, Hydropower development

CE5203 Irrigation Engineering (2 Credits)

Learning Outcomes: 1. Analyse and select appropriate irrigation practices and irrigation methods for effective irrigation 2. Plan irrigation systems and execute preliminary designs of irrigation infrastructure including head works and distribution systems 3. Analyse economic and environmental feasibilities of irrigation projects 4. Discuss the irrigation systems, water polices in Sri Lanka and evaluate the modernization needs and resilience of the existing systems

Course Contents: Types of irrigation practices and methods, Irrigation systems: Planning, design and management, Feasibility analysis and sustainability, Irrigation systems in Sri Lanka

CE5304 Advanced Water and Wastewater Treatment (3 Credits)

Learning Outcomes: 1. Appraises advanced technologies associated with drinking water treatment 2. Select appropriate unit operations to treat target wastewater/sewage sludge to achieve the desired characteristics for reuse or disposal 3. Design the basic components of wastewater collection, treatment and reuse/disposal and sewage sludge treatment systems 4. Generate comprehensive reports and drawings to communicate the final outcomes of Environmental Engineering designs

Course Contents: Advanced Water Treatment Process, Design of engineered systems for advanced wastewater treatment, Sludge treatment/handling processes, Water Reclamation and Reuse

CE5305 Environmental Management (3 Credits)

Learning Outcomes: 1. Describe the emerging need for environmental management and apprehend the current legislative and regulatory framework in Sri Lanka related to environment 2. Execute coherent decisions in environmental management 3. Formulate an environmental impact assessment (EIA) report for a developmental activity 4. Apply state-of-the-art strategies for sustainable environmental management plans 5. Demonstrate the work collaboratively in a team and Communicate effectively in written reports and oral presentations

Course Contents: Introduction to Environmental Management, Environmental pollution and sustainable pollution control measures and techniques, Environmental Impact Assessment (EIA), State-of-the-art environmental management concepts and applications

CE5211 Transportation planning (2 Credits)

Learning Outcomes: 1. Identify and formulate problems related to transportation planning and design 2. Determine mathematically appropriate tools for solving formulated problems 3. Conduct a basic traffic impact assessment 4. Assess accident risks and propose suitable remedial measures

Course Contents: Introduction to Transportation Systems, Transport Surveys, Transport Demand Estimation, Road safety and Accident Analysis, Traffic Impact Assessment (TIA), Feasibility Studies for transport Infrastructure

CE5212 Highway Construction and Maintenance (2 Credits)

Learning Outcomes: 1. Select and classify highway construction material for subgrade, subbase, and base while giving due importance to loadings and other design criteria 2. Execute material testing according to standard test methods to check the suitability of a given material for the intended purpose 3. Design a hot mix asphalt layer or rigid pavement layer giving due consideration to the volumetric properties and design standards 4. Appraise pavement maintenance practices and recognize the importance of pavement management systems giving due consideration to road distresses and their severity

Course Contents: Subgrade Construction, Base/ Subbase Construction, Road Surface Construction, Rigid Pavement Construction, Highway Maintenance

CE5221 Bridge Engineering (2 Credits)

Learning Outcomes: 1. Identify the main components and stages in the bridge design and construction 2. Discern the loading path of different bridge types 3. Analyse and design bridges made of steel, reinforced concrete, masonry and pre-stressed concrete 4. Select counterparty techniques to inspect and maintain the structural integrity of bridge

Course Contents: Classification of Bridges, Loading Systems on Bridges, Analysis and Design of Bridges, Introduction to Cable Stayed and Suspension Bridges, Design of Substructures and Foundations, Techniques adopted in Construction of Bridges, Routine Inspection and Maintenance of Bridges

CE5322 Advanced Structural Design (3 Credits)

Learning Outcomes: 1. Design water retaining structures 2. Design prestressed beams under ULS and SLS 3. Design High rise building against wind and seismic actions

Course Contents: Design of Water Retaining Structures, Pre-Stressed Concrete Design, High Rise Buildings Design

CE5223 Computer Based Structural Design (2 Credits)

Learning Outcomes: 1. Select appropriate numerical tools to solve different structural engineering problems 2. Generate numerical models of commonly used structural elements/structures 3. Analyse complicated structures by using relevant computer software 4. Interpret the numerical results based on the fundamentals learned

Course Contents: Introduction to Structural Analysis Computer Software, Introduction to Relevant Software , Computer Modelling of Reinforced Concrete Framed Structures, Computer Modelling of Shell Type Structures, Computer Modelling of Space Trusses, Computer Modelling of Transmission Towers

CE5324 Advanced Mechanics of Materials (3 Credits)

Learning Outcomes: 1. Recognize the plate bending differential equation and solve classical thin plate problems 2. Analyse classical shell problems using thin shell theory 3. Relate the finite element formulation of plate and shell elements with the stress resultants and deformations of plates and shells 4. Use plastic hinge concept to find the

plastic collapse capacity of beams and frames 5. Use yield line theory to find approximate plastic capacity of plates

Course Contents: Analysis of Plates, Analysis of Shells, Plastic Analysis of Continuous Beams and Frames, Yield Line Analysis,

CE5331 Ground Improvement techniques (3 Credits)

Learning Outcomes: 1. Describe basic techniques of ground improvement indicating where they are applicable 2. Analyse the effect of ground improvement using geotechnical theories 3. Design a suitable ground improvement system for a given situation indicating how it can be implemented

Course Contents: Introduction to ground improvement, Surface and deep compaction, Preloading and vertical drains, Granular Piles, Surface and Deep mixing, and grouting in soils, Reinforced soil and basic concepts of geosynthetics

6.2 Modules offered by Department of Computer Science and Engineering

CS1301 Introduction to Computing (3 Credits)

Intended Learning Outcomes: 1. Explain the theoretical foundations of computing 2. Apply the basic computer programming concepts 3. Experiment the basics of networking and the Internet 4. Design and develop simple web pages 5. Use analytical and simulation software to process and present engineering information

Course Contents: Overview of computer systems, Introduction to computer programming fundamentals using Python, Fundamentals of computer networks and the Internet, Overview of web contents development, Introduction to analytical and simulation software— Introduction to the basic theory in numerical computation, Fundamental concepts in programming, Data Presentation

CS2301 Computer Programming (3 Credits)

Intended Learning Outcomes: 1. Introduction 2. Apply the basic and intermediate computer programming concepts 3. Develop procedural programs using high level programming languages by using an Integrated Development Environment (IDE) 4. Implement a collection of objects and compose a system that function according to object-oriented programming design 5. Use common data structures and algorithmic techniques

Course Contents: Introduction to the course, Computer programming concepts, Procedural Program development by using Integrated Development Environment (IDE), Introduction to Object Oriented Programming Concepts, Introduction to Data Structures and Algorithms

CS2302 Computer Architecture (3 Credits)

Intended Learning Outcomes: 1. Explain the modern architecture of computer systems 2. Demonstrate representation of data and its operations in computer systems 3. Demonstrate functionalities of memory hierarchy of computer systems 4. Explain the functionalities of input-output devices and their interfaces 5. Design simple CPU and ISA 6. Compare various performance enhancement mechanisms in computer systems

Course Contents: Overview of a computer system, Arithmetic for Computers, CPU organization, Memory organization, Input-output organization, Performance enhancement mechanisms, Emerging trends in computer architecture

CS3301 Computer Networks (3 Credits)

Intended Learning Outcomes: 1. Demonstrate how TCP and UDP protocols operate 2. Compare and contrast different routing algorithms and protocols 3. Identify network services and application layer protocols 4. Implement an internetwork with different types of LANs, switching, and routing mechanisms

Course Contents: OSI and TCP/IP layered protocol architectures, LAN and WAN, Network layer, Transport layer, Application layer

CS3302 Data Structures and Algorithms (3 Credits)

Intended Learning Outcomes: 1. Implement and use common data structures. 2. Implement and use basic sorting and searching algorithms. 3. Analyse the complexity of basic algorithms. 4. Select appropriate data structures and algorithms for a given situation. 5. Apply basic algorithm design techniques for a given situation.

Course Contents: Introduction to the course, Sorting, Complexity Analysis of Algorithms, Searching, Basic Data Structures and Operations on them, Basic algorithm design techniques, Introduction to NP-Completeness

CS5301 Operating Systems (3 Credits)

Intended Learning Outcomes: 1. Describe the fundamental components of a computer operating system 2. Discuss the concepts in scheduling, deadlocks, memory management, synchronization, system calls, and file systems 3. Extrapolate the interactions among the various components of computing systems 4. Implement the OS components such as system calls, schedulers, memory management systems, Virtual Memory and Paging systems 5. Explain and compare security mechanisms for conventional operating systems

Course Contents: Operating System as a virtual machine and a resource manager, Processes and Threads, Process and Thread scheduling, Mutual Exclusion and Synchronization, Memory management, I/O management and Disk scheduling, File Systems, Protection and security

CS5302 Machine Learning (3 Credits)

Intended Learning Outcomes: 1. Identify the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc. 2. Explain the strengths and weaknesses of popular machine learning approaches 3. Demonstrate the use of supervised, unsupervised, and reinforced learning approaches 4. Experiment various machine learning algorithms in real-world applications 5. Solve real-world application using deep learning method

Course Contents: Introduction to the course, Supervised learning, Unsupervised learning and pre-processing, Model evaluation and improvement, Deep learning

CS5303 Data Science for Engineers (3 Credits)

Intended Learning Outcomes: 1. Describe a flow process for data science problems (Remembering) 2. Classify data science problems into standard typology (Comprehension) 3. Develop R codes for data science solutions (Application) 4. Correlate results to the solution approach followed (Analysis) 5. Assess the solution approach (Evaluation) 6. Construct use cases to validate approach and identify modifications required (Creating)

Course Contents: Introduction to R, Linear algebra for data science, Statistics, Optimization, Typology of data science problems and a solution Framework, Regression, Classification

6.3 Modules offered by Department of Electrical and Telecommunication Engineering

EE1301 Principles of Electrical Engineering (3 Credits)

Learning Outcomes: 1. Solve DC circuits using circuit theorems and techniques including Thevenin's theorem, superposition, and source transformation 2. Describe the transient behavior of non-linear circuit elements 3. Explain and use vector and complex representation of AC quantities 4. Solve AC circuits in their steady state 5. Draw the complete wiring circuit of a household and explain the importance of components 6. Describe the steps involved in electrical power generation, transmission, distribution and utilization

Course Contents: DC circuit analysis, AC theory, Electrical Installations, Electrical Power Systems

EE1302 Principles of Electronics (3 Credits)

Learning Outcomes: 1. Explain the operation of diode circuits and their implementation 2. Explain the operation of BJTs and implement transistor amplifier circuits and switching circuits using BJTs 3. Analyze digital logic circuits 4. Construct simple digital logic circuits

Course Contents: Diode circuits, Transistor amplifiers and switches with BJT, Digital circuits

EE2201 Electromagnetics (2 Credits)

Learning Outcomes: 1. Solve electrostatic field problems involving simple electrode configurations 2. Solve electromagnetic field problems for standard and practical conductor configurations 3. Calculate the forces acting on a charge in electric and magnetic fields and determine its trajectory 4. Apply Maxwell's equations in typical situations 5. Solve problems related to plane wave propagation through lossless or lossy media considering boundary conditions

Course Contents: Electrostatics Field Theory, Electromagnetic field theory, Electrodynamics, Maxwell's equations, Quasi stationary fields, Plane waves, TEM waves, TE and TM waves

EE2202 Electrical Circuit Analysis (2 Credits)

Learning Outcomes: 1. Analyse a circuit using both manual and computer-based methods 2. Derive network functions for a given circuit and thereby explain the circuit properties 3. Synthesis networks and filter circuits 4. Simulate a circuit using computer software

Course Contents: The s-plane, Introduction to the state-space representation, Computer aided circuit simulation, Synthesis of passive networks, Classical filter design

EE2203 Electrical Measurements (2 Credits)

Learning Outcomes: 1. Identify and describe various functional elements of the measurement process and estimate different properties related to measurements in general 2. Explain and apply the concept of standards and their importance, and the process of calibration of instruments 3. Differentiate the working principles of both analog and digital measuring instruments and their applications 4. Illustrate various sensors and transducers used for measuring different physical parameters

Course Contents: General principles of measurements, Instruments used to measure electrical quantities, Cathode ray oscilloscope, Bridge methods, Transducers, Digital meters

EE2304 Digital Electronics (3 Credits)

Learning Outcomes: 1. Design, build and test combinational digital circuits 2. Design, build and test sequential digital circuits 3. Differentiate characteristics of logic families 4. Implement logic circuits with MSI chips 5. Compare different types of analogue-to-digital and digital-to-analogue converters

Course Contents: Combinational logic circuits, Sequential logic circuits, Logic families, MSI logic circuits, Analogue to digital and digital to analogue converters

EE2305 Introduction to Telecommunications (3 Credits)

Learning Outcomes: 1. Review the historical evolution of the telecommunications industry 2. Define the basic theoretical concepts and terminology related to telecommunications signals and systems 3. Evaluate simple characteristics of signals and communication systems 4. Classify and compare communication systems in different ways such as analogue/digital, baseband/modulated, fixed/mobile, local area/wide area etc. 5. Discuss future trends in the telecommunications industry

Course Contents: Introduction, Basic theoretical concepts in telecommunications, Modulation and Multiplexing, Telecommunication networks and services

EE2306 Theory of Electricity (3 Credits)

Learning Outcomes: 1. Solve coupled circuits involving mutual impedance, dependent voltage/current sources and/or resonance phenomena 2. Apply network theorems in solving circuits 3. Solve circuits containing three phase generators and loads 4. Analyse circuits with non-sinusoidal voltage/ current sources

Course Contents: Review of fundamentals and resonance circuits, Network theorems, Coupled circuits and dependent sources, Three phase analysis, Non-sinusoidal periodic and non-periodic waveforms, Transient analysis using Laplace transform

EE2307 Introduction to Electrical Machines & Power Systems (3 Credits)

Learning Outcomes: 1. Explain the construction features and operating principles of DC and AC machines 2. Describe the operation and features of single phase and three phase transformers 3. Describe power generation and distribution systems 4. Demonstrate the knowledge of electricity tariff systems 5. Calculate voltage drop and power loss in radial and ring type power distribution systems 6. Describe techniques used to improve end use efficiency and to do necessary calculations

Course Contents: Electromechanical energy conversion, Transformers, DC machines, AC Machines, Power generation and distribution, Electricity tariff, Efficient utilization of power

EE2308 Analogue Electronics (3 Credits)

Learning Outcomes: 1. Analyse small-signal BJT and FET amplifiers 2. Identify the functionality and applications of operational amplifiers 3. Analyse different power amplifier classes and their characteristics 4. Build and test analogue electronic circuits

Course Contents: Small-signal BJT and FET amplifiers, Functionality and applications of operational amplifiers, Power amplifier classes and their characteristics

EE2309 Signals & Systems (3 Credits)

Learning Outcomes: 1. Classify signals and systems 2. Analyse signals and systems using time, frequency, Laplace and Z-domain tools 3. Describe the relationship between the input and output of Linear Time Invariant (LTI) systems 4. Apply appropriate tools and techniques for the evaluation of communication system building blocks

Course Contents: Introduction, Fundamentals of Signals and Systems, Time domain representation of Linear Time Invariant (LTI) Systems, Fourier analysis of signals and systems, Laplace domain analysis of signals and systems, Z-domain analysis of signals and systems

EE2210 Electronics for Mechanical Engineers (2 Credits)

Learning Outcomes: 1. Design transistor amplifiers 2. Identify integrated differential and operational amplifier applications 3. Design power amplifiers, power supplies and voltage regulators 4. Describe power electronic devices and their uses 5. Design combinational digital circuits 6. Identify the use of programmable devices 7. Compare different types of A to D and D to A converters

Course Contents: Transistor amplifiers, Integrated differential and operational amplifiers, Power amplifiers, power supplies and voltage regulators, Power electronic devices and their uses, Combinational and sequential digital circuits, Memory devices, A to D and D to A converters

EE3301 Power Systems I (3 Credits)

Learning Outcomes: 1. Explain characteristics and construction features of underground and overhead transmission systems and their effects on environment and human life 2. Calculate parameters of a practical transmission line and evaluate its performance 3. Design an overhead line complying to standards 4. Explain the use and function of switchgear and methods of system grounding 5. Perform load flow analysis on power systems using standard techniques 6. Calculate fault currents in a practical power system

Course Contents: Power transmission, Mechanical characteristics of lines, Transmission line modelling, Switchgear, Load flow analysis, Fault analysis

EE3302 Communication Theory (3 Credits)

Learning Outcomes: 1. Characterize random signals and processes 2. Analyse analogue modulation/demodulation schemes and their performance in noise 3. Explain the principles related to pulse modulation 4. Analyse the behaviour of digital signals in noise

Course Contents: Signal and Systems Models, Analogue modulation schemes, Random processes and noise, Digital Representation of Analogue Signals, Introduction to Digital Communications

EN3303 Power Electronics (2 Credits)

Learning Outcomes: 1. Describe the fundamental principles of power electronic devices 2. Identify applications of power electronics 3. Build and test power electronics devices and circuits

Course Contents: Power electronic devices, Power supplies and voltage regulators, Motor controlling

EE3204 Applied Electromagnetics (2 Credits)

Learning Outcomes: 1. Apply Maxwell's equations for time varying electromagnetic fields and identify electromagnetic wave propagation 2. Identify transmission lines and propagation of signals through twin lines and coaxial lines 3. Identify metal waveguides and their properties in RF and microwave signal propagation 4. Demonstrate an understanding of different antennas and their uses

Course Contents: Electromagnetic wave propagation, Transmission Lines, Metal Waveguides, Antennas and Radiation

EE3305 Communication Systems I (3 Credits)

Learning Outcomes: 1. Identify a variety of systems which enable subscribers to access different types of telecommunication services 2. Identify key features of different generations of access networks and associated standards 3. Compare the nature and capabilities of wired, wireless and optical access networks 4. Demonstrate awareness of the evolution of broadcasting, including new standards

Course Contents: Wired access networks, Wireless Multiplexing/Multiple Access Techniques, Wireless access networks, Optical communications and access networks, Broadcast networks

EE3306 Control Systems (3 Credits)

Learning Outcomes: 1. Derive the model of a plant 2. Design a feedback control system for a plant 3. Model and simulate control systems using Matlab and Simulink 4. Analyse performance of control systems

Course Contents: Plant Modelling, Response and Feedback Control, Control systems design in time-domain, Control systems design in frequency-domain, Implementation of Control systems

EE3307 Electrical Installations (3 Credits)

Learning Outcomes: 1. Describe the structure of IEE Wiring Regulations with respect to cable types and sizes, earthing systems, special installation requirements and apply them in electrical installation designs 2. Distinguish the characteristics of different types of protective devices used in Electrical Installations, their principles of operation, advantages and disadvantages 3. Differentiate among electrical wiring systems in Domestic, Commercial, and Industrial applications 4. Carry out inspection and testing in electrical installations 5. Carry out a lighting design for a building environment

Course Contents: Electrical Installations, Domestic and Industrial Lighting Design, Wiring Design

EE3308 Electrical Machines & Drives I (3 Credits)

Learning Outcomes: 1. Operate a large generator and vary its output power within safe limits 2. Perform calculations of steady state behaviour of generators, three-phase transformers and three-phase and single-phase induction motors 3. Select appropriate starting, braking, or speed control equipment for a three-phase induction motor for a given application. 4. Select and apply synchronous generators, three phase transformers and three phase induction motors 5. Demonstrate knowledge of construction and operation of stepper motor drives

Course Contents: Synchronous generators for bulk generation, Three-phase transformers, Three-phase induction motors, Single-phase induction motors, Stepper motor drives

EE4301 Robotics (3 Credits)

Learning Outcomes: 1. Describe different types of robots and their applications at present and future 2. Describe industrial applications of robots and their significance in development 3. Carry out static and differential kinematic analysis of a robot manipulator 4. Design a trajectory planner and control system for a robot manipulator 5. Implement force torque analysis of a constrained robot manipulator

Course Contents: Introduction to Robotics, Co-ordinate Transformation, Manipulator Static Kinematics, Manipulator Differential Kinematics, Trajectory planning and control of robot manipulators, Force Control of Manipulators

EE4302 Power Systems II (3 Credits)

Learning Outcomes: 1. Perform load flow analysis on power systems using standard techniques 2. Explain and perform calculations related to frequency and voltage control of a power system 3. Demonstrate knowledge of power system stability phenomena and use stability calculations to improve system performance 4. Perform economic dispatch of generating units taking system constraints into consideration 5. Calculate reliability indices and use them in power system planning

Course Contents: Introduction to power system protection, Transmission line protection, over current and distance protection Power system control, Power System stability, Power system economics, Power system planning and reliability

EE4403 Final Year Project (Part I) (4 Credits)

Learning Outcomes: 1. Apply the process of scientific research, techniques, and rationalisation 2. Conduct a research study on a topic of interest using appropriate techniques and resources 3. Incorporate the outcomes of the research in an appropriate manner during the development phase 4. Demonstrate independent learning and technical presentation ability through research project presentation and proposal/report writing 5. Demonstrate the ability to solve an engineering problem for improvement including cost, efficiency and innovation

Course Contents: Problem Identification (research and development), Project proposal formulation, Project implementation and demonstration, Project reporting and presentation

EE4406 Final Year Project (Part II) (4 Credits)

Learning Outcomes: 1. Incorporate the outcomes of the research in an appropriate manner during the development phase 2. Demonstrate the ability to solve an engineering problem for improvement including cost, efficiency and innovation 3. Demonstrate independent learning and technical presentation ability through research project presentation and report writing

Course Contents: Project implementation and demonstration, Project closing and product development/articulate research findings, Project reporting and presentation

EE4304 Communication Systems II (3 Credits)

Learning Outcomes: 1. Design microwave links for terrestrial and satellite communication systems 2. Demonstrate knowledge of the principles of electronic navigation and navigation systems 3. Describe optical transmission techniques and devices 4. Identify how the core network in telecommunication supports global connectivity between services, content and subscribers

Course Contents: Microwave communication systems, Radar and Navigation, Optical transmission, Core networks

EE4305 Mechatronic Applications (3 Credits)

Learning Outcomes: 1. Input and output analogue and digital signals to and from a microcontroller 2. Program a control algorithm onto a microcontroller 3. Interface sensors and actuators to a microcontroller

Course Contents: Introduction to mechatronics, Data acquisition, Sensor interfacing, Actuator control, Mechatronic system design

EE5201 Energy Studies (2 Credits)

Learning Outcomes: 1. Evaluate the primary energy sources, their limitations and costs 2. Assess the world/Sri Lanka energy demand and the demand growth 3. Explain the different energy conversion processes, their efficiencies and associated economics 4. Explain the Sri Lanka energy policy 5. Evaluate the relationship between economic development and energy as a catalyst to all sectors of a macro economy 6. Describe the importance of energy planning; integrated energy planning 7. Explain the necessity of moving towards more sustainable energy sources such as non-conventional renewable energy and environmental impacts of conventional energy sources

Course Contents: Conventional energy resources, non-conventional energy resources, Energy consumption patterns, Energy conversion processes, Energy Policy, Energy planning and energy management, energy data bases, Energy economics, Environmental impacts and clean development mechanism.

EE5202 High Voltage Engineering (2 Credits)

Learning Outcomes: 1. Understand theoretically the failure of various dielectrics 2. Understand the lightening phenomena, Design surge protection systems 3. Carry out a theoretical design of a cable based on minimizing its stress distribution 4. Analyse transients in high voltage transmission lines 5. Measure high voltages used for testing and do calibrations on testing equipment 6. Analyse circuits producing high voltages for testing purposes

Course Contents: High voltage breakdown phenomena, Lightning phenomena, High voltage cables, High voltage transient analysis, Measurement of high voltage, High voltage generators for testing, High voltage surge generators

EE5203 Electrical Machines & Drives II (2 Credits)

Learning Outcomes: 1. Demonstrate the knowledge of transient behaviour of a synchronous generator 2. Design and implement a three-phase induction motor drive system covering wide speed range 3. Identify where and how to apply brushless and synchronous motor drives in industry 4. Select the type and size of a motor to serve a given application 5. Perform thermal calculations for motors and generators 6. Demonstrate the knowledge of AC and DC windings and associated calculations

Course Contents: Transient performance of synchronous generators, AC and DC windings, Brushless DC motor drives, Three-phase induction motor drives, Synchronous motor drives, Operational aspects

EE5204 Electronic Instrumentation (2 Credits)

Learning Outcomes: 1. Explain the operational principles of various electronic instruments and decide on a suitable sensor / transducer system to a given application requirement 2. Analyse measurement errors associated with instruments, and perform calibration as required 3. Select instruments to suit a given measurement environment and given accuracy 4. Implement a microcontroller-based measurement and control system

Course Contents: General Measurement Theory, Operational principles of electronic instrument, Instrument usage

EE5205 Industrial Electronics (2 Credits)

Learning Outcomes: 1. Specify the characteristics of sensors and actuators required for an automated system design 2. Model a control system 3. Select and integrate different modules to work in different environments 4. Implement a control system for a real world application

Course Contents: Types of sensors and actuators, System modelling and control, Type of systems, Systems integration

EE5206 Digital System Design (2 Credits)

Learning Outcomes: 1. Demonstrate the required skills in Hardware Description Language that facilitates rapid prototyping of digital systems 2. Design sequential systems using RTL based approach 3. Describe different approaches available for processor design 4. Analyse the requirements of a system to decide whether a custom-made processor is required 5. Design a custom-made processor

Course Contents: Hardware Description Languages (HDL), RTL based system design, RISC Architecture, Processor design, Memory design, Asynchronous sequential system design

EE5207 Digital Communications (2 Credits)

Learning Outcomes: 1. Analyse different digital modulation techniques theoretically 2. Design optimum receivers for linear modulation schemes in AWGN channels 3. Design signals for communication over bandwidth constrained channels 4. Derive BER performance in multipath fading channels 5. Design a lossless source code for a given discrete memory-less source 6. Apply error control coding for the improvement of reliability of digital communication systems

Course Contents: Digital carrier modulation techniques, Receiver design for AWGN channel and performance, Signal design for bandwidth-constrained channels, Communication over fading wireless channel, Source and channel coding

6.4 Modules offered by Department of Interdisciplinary Studies

ID1301 Mathematics - I (3 Credits)

Learning Outcomes: 1. Demonstrate basic Mathematics rules and apply the structured mathematical approaches to problem solving 2. Find the simplified Boolean expression by Karnaugh maps 3. Solve problems using appropriate mathematical knowledge and methods 4. Find eigenvalues and eigenvectors by the theories of matrices

Course Contents: Mathematics Logic, Boolean Algebra, Karnaugh Maps, Minimization, and Applications, Set Theory, Vectors, Definition of Vector Space, Linear Algebra, Inverse of a matrix, Determining Eigenvalues and Eigenvectors

ID1202 English (2 Credits)

Learning Outcomes: 1. Speak effectively and confidently in English in real life situations 2. Use basic sentence construction knowledge and write academic texts 3. Read and comprehend variety of texts with inferring, skimming and scanning 4. Write effectively in different genres and demonstrate listening and note taking skills 5. Apply stock of vocabulary needed for the academic studies

Course Contents: Introduction, Focus on grammar, Reading comprehension, Reading skills-skimming and scanning, Grammar review, Introducing word formation, Focus on creative writing, Grammar review, Reading and role play, Subject + Verb Agreement "if" conditional, Conditionals in writing, Using collocations, Learning about process writing, Preparing a short report writing, Describing and interpreting different charts and graphs, UTEL orientation, UTEL mock test, Describing shapes and features, Reading comprehension and listening skills, Use of simple past tense and simple past passive voice, Grammar review: Relative clauses, Pre and post listening activities to improve the note taking while listening with prepared task, Group discussion and writing, Describing figures, Grammar review: present perfect and past perfect tenses, Understanding sentence structure and use of verbs, Revision

ID1303 Mathematics - II (3 Credits)

Learning Outcomes: 1. Apply the knowledge of differential equations to solve engineering problems 2. Demonstrate sound understanding of linear, surface and volume integrals 3. Solve systems of linear equations by matrix algebra and determinants

Course Contents: Ordinary Differential Equations, Differential Equations, Homogeneous and Exact Differential Equations, Second Order Differential Equations, Vector Calculus, Ordinary integrals of vectors, Line integrals, Surface integrals, Volume integrals, The Green's theorem, Gauss theorem and Stoke's theorem in the plane, Systems of Linear Equations, Iterative Methods

ID1204 Communication Skills for Engineers (2 Credits)

Learning Outcomes: 1. Communicate most effectively and efficiently both verbally and in writing 2. Write business letters, memos, project and field reports that are

grammatically correct and in appropriate business style 3. Deliver effective presentations to the wider Engineering and non-Engineering stakeholders 4. effective interpersonal communication skills to become brand ambassadors of their representations 5. Demonstrate confidence in communicating their ideas to larger wide non-technical audience 6. Write a good job application to attract the employers and gather information to present it to their peers/hierarchies to advocate for actions

Course Contents: Planning for business writing, Language needed for business writing, Memos/Notice/ invitations –response, Layout of business letters, Writing E-Mails, Informal letters and notes, Writing cover letter, job application, and CV, Writing effectively, Writing technical reports, Publishing and marketing your reports, Learning the Three Ps of Oral Presentations, Powerful Presentation Skills, Presenting for Success, Successful presenter, Pitching an idea for general audience, Field visits

ID2301 Differential Equations (3 Credits)

Learning Outcomes: 1. Apply a range of techniques to find solutions of standard partial differential equations 2. Solve first and second order partial differential equations, which are physically important, under given boundary conditions 3. Derive Fourier series of a given periodic function by evaluating Fourier coefficients and expand an odd or even function as a half-range cosine or sine Fourier Series 4. State fundamental mathematical properties of the Fourier transform including linearity, shift, symmetry, scaling, modulation and convolution 5. Compute the Laplace transform of a function and use theorems to compute the Laplace transform and inverse Laplace transform 6. Compute the Z transform of elementary sequences both from the definition and by using tables and use the appropriate theorems to calculate Z transforms and inverse Z transforms 7. Develop advanced mathematical models through differential equations and transforms, and appropriately apply to a range of problems in engineering

Course Contents: Partial Differential Equations, Fourier Series Approximations, Fourier Transform and Applications, Laplace Transform and Applications, Z Transform and Applications

ID2302 Probability and Statistics for Engineers (3 Credits)

Learning Outcomes: 1. Define statistics, experiment, sample space, event, probability and equally likely to occurrences 2. Derive and use the formula for finding the probability of an event and mutually exclusive events 3. Identify and use which addition rule applies to mutually exclusive events and non-mutually exclusive events 4. Use the concept of a statistical distribution 5. Derive the mean and variance of a variety of random variables 6. Apply basic probability principles to solve problems and manipulate probabilities in practical situations

Course Contents: Introduction to Probability and Statistics, Counting Rules Useful in Probability, Conditional Probability and Independency, Probability Distributions and Expected Values of Random Variables, Multivariate Probability Distributions, Bivariate and Marginal Probability Distributions, Conditional Probability Distributions, Expected Values of Functions of Random Variables, Introduction to Control Charts, Simple Linear Regression

ID2303 Industrial Management - I (3 Credits)

Learning Outcomes: 1. Discuss and recognize cost and management principles in decision making, in planning, design and implementation and day-to day running of engineering related ventures 2. Interpret financial reports and communicate with the Accounting Personnel in an engineering venture regarding cost and management accounting aspects 3. Describe the use of break-even-point chart in fundamental micro-economic activities 4. Interpret the basic principles of micro-economics and macro-economics for decision making in marketing, production and investment

Course Contents: Introduction to Cost and Management Accounting, Cost concepts and cost terms, Accounting for Material, Accounting for Labour, Accounting for Overhead, Various types of costing, Cost volume and profit analysis (CVP), Decision making using CVP and relevant cost concepts, Fundamentals of Accounting, Financial Statements, Budgets and forecasted financial statements, Capital investment decisions, Management of working capital, Managing current assets, Introduction to Economics Management, Theory of Production, Production in the Long-run, Derivation of Supply and Demand, Determination of Market Price in Perfect Competition, Determination of Output, Revenue and Profit, Imperfect Competition, Macro Economics: The Business Cycle and National Income

ID3301 Complex Analysis and Numerical Methods (3 Credits)

Learning Outcomes: 1. State fundamental concepts of complex numbers and functions, and demonstrate familiarity of these concepts by solving computational problems 2. complex contour integrals directly and by using fundamental theorem, and apply the Cauchy integral theorem and Cauchy integral formula 3. Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem 4. Apply appropriate numerical methods to approximately solve, otherwise intractable mathematical problems and analyse accuracy of implemented methods 5. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equation systems, and the solution of differential equations (ordinary and partial) 6. Implement numerical methods in corresponding computational steps (i.e. without using high level library functions) to solve mathematical problems by using a chosen software development environment (such as Matlab, Octave, SciLab, Phython..)

Course Contents: Complex Numbers and Functions, Complex Integration, Infinite Series, Numerical Solutions of System of Linear Equations, Numerical Solutions of System of Non-Linear Equations, Numeric Linear Algebra, Numerical Differentiation and Integration, Numerical Solutions of Ordinary Differential Equations, Numerical Solutions of Partial Differential Equations

ID3302 Industrial Management - II (3 Credits)

Learning Outcomes: 1. Describe the basic principles of micro-economics and macro-economics for decision making in marketing, production and investment 2. Interpret and make choices of alternative projects 3. Describe basic concepts and principles of

organizational management and apply them to manage modern organizations 4. Identify the principles and practices of the primary areas of human resource management and industrial relations in organizations 5. Describe basic marketing concepts, theories and their applications 6. Illustrate the basic concepts and theories of management of technology and identify their usage in modern organizations and economy

Course Contents: Money, Taxation, Public or Welfare Economics, Inflation, Project Appraisals, Decision making on Cost-benefit analysis, Organization Management, Human Resources & Industrial Relations Management, Marketing Management, Technology Management

ID4301 Project Management (3 Credits)

Learning Outcomes: 1. Execute a project planning using project management tools and techniques 2. Produce project progress reports 3. Use of leading project management software

Course Contents: Project Management Framework, Organization Types, Project Management Knowledge Areas, Project Management Information Systems

ID4202 Engineer in Society (2 Credits)

Learning Outcomes: 1. Discuss the functions and roles of an engineer 2. Characterize professional ethics, sustainability and cost-effectiveness in engineering design and practice 3. Apply engineering principles in handling societal and environmental issues with regard to engineering practice 4. Apply professional and ethical judgment in design and engineering obligations 5. Develop the ability to work as a team-member to handle complex engineering problems

Course Contents: Engineering and Technology development, Engineers' attributes, Engineering as a profession, Service learning in engineering, Interdisciplinary approach, Sharing and dissemination of knowledge, Engineering challenges in modern society

ID4203 Entrepreneurship & Intellectual Property (2 Credits)

Learning Outcomes: 1. Describe the competencies required to commence own enterprise with confidence after few years of industry experience 2. Apply the basic aspects related to entrepreneurship for establishment of an enterprise including protection of IPR 3. Work within the scope of product (or service) cycles including accessing technology and collaboration 4. Application of IPR and related laws and conventions on Patents, Industrial Designs, Trademarks etc.

Course Contents: Engineer as a Job Seeker or a Job Provider, Establishing an Enterprise, Economic Viability, Financial feasibility, Operational Procedures, Competitiveness and market share, Introduction to Intellectual Property, Need and use of Inventions and Innovations for an Enterprise, Patents – Understanding, Drafting, Obtaining Patent rights

ID4204 Industrial Law (2 Credits)

Learning Outcomes: 1. Demonstrate the basic knowledge of legal system of Sri Lanka, Structure of the court system 2. Demonstrate the essential knowledge of contract law and apply the legal principles of a valid contract to a given factual situation 3. Explain the factories ordinance and its importance 4. Demonstrate the knowledge of basics of employment law of Sri Lanka

Course Contents: Introduction to legal systems and Court system of Sri Lanka, Nature and types of contracts, Employment Law, Factories Ordinance, Settlement of industrial disputes, Termination of employment, Trade unions, Legislation on terms and conditions of employment

ID5201 Introduction to English Literature (1 Credit)

Learning Outcomes: 1. Describe the background knowledge necessary to study English Literature 2. Identify the different genres and their structure 3. Distinguish the language skills necessary for appreciation 4. Use reading skills necessary for effective study of literary texts.

Course Contents: Introduction: Different forms of texts and genres including novels, short stories, poetry and skills required in literature studies; Poetry: William Shakespeare - Shall I Compare thee to a Summer's day, William Wordsworth – Daffodils, Robert Herrick - To Daffodils, William Blake - The Poison Tree, Clod and Pebble, Anne Ranasinghe - On the Beach, Kamala Wijeratne - The White Saree, Suresh Canagarajah - Let life go on; Short Stories: Oscar Wilde - The Nightingale and the Rose, Punyakante Wijenayake - The Hut, Nirmali Hettiarachchi - The Competition, Maureen Seneviratne – Reunion

ID5102 Poetry and Short Stories (1 Credit)

Learning Outcomes: 1. Respond personally to the text: feelings, characters, events, scenes, settings 2. Confidently read and appreciate a range of literary text 3. Describe contextual meaning of a literary work 4. Trace development of character

Course Contents: Introduction: Brief overview of the craft and culture of poetry, short story; range of poetry and variety of short texts written in English and short stories translated into English; Poetry: William Blake - The Garden of Love, London, William Wordsworth - The Solitary Reaper, The Rainbow, P.B. Shelley- Ozymandias, John Keats- Ode to Autumn, Alfred Lord Tennyson- The Charge of the Light Bridge; Short Stories: O. Henry - The Gift of the Magi, James Joyce – Eveline, Saki- Open Window

ID5103 English Novels (1 Credit)

Learning Outcomes: 1. Describe how texts are related to social and cultural categories 2. Describe the approaches and techniques of novels 3. Describe contextual meaning of a literary work 4. Develop a deeper sense of the nature of classical literature

Course Contents: Introduction to Novels, Charles Dickens - Great expectations / Oliver Twist (OR) Jane Austen - Pride and Prejudice, George Orwell – Animal Farm (OR) Anita Desai - The Village by the sea

ID5211 Climate Change (2 Credits)

Learning Outcomes: 1. Describe the causes and evidence of climate change and the possible impacts of climate change 2. Explain the basic principles of carbon economy, carbon print and greenhouse gas emissions inventories 3. Explore and analyse both technological and policy responses to the challenge of climate change.

Course Contents: Basics of Climate Change, Global Climate Change: The Evidence, Causes of Climate Change, Climate Change Predictions and Impacts, Economic aspects of climate change, International action on climate change adaptation and mitigation.

ID5212 Disaster Management (2 Credits)

Learning Outcomes: 1. Explain the disaster management terms and concepts 2. Describe and analyse the relationship between vulnerability, disasters, disaster prevention and risk reduction 3. Classify the approaches of Disaster Risk Reduction and their components 4. Demonstrate the basic ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

Course Contents: Introduction to Disasters, Disaster Management Concept, Technologies for Disaster Management, Disaster Mitigation, Reconstruction and Rehabilitation as Means of Development, Education and Awareness, Role of Various Agencies in Recovery Measures, Response Essential Components

ID5213 Psychology for Life (2 Credits)

Learning Outcomes: 1. Explain the basic psychological concepts to understand themselves and others in a working environment 2. Analyse and solve the problems and difficulties facing in their lives 3. Develop a good attitude and personality in the social context

Course Contents: Basic Psychological concepts and human behaviour, Understanding human behaviour through body language, Personality structure, Learning, Perception, Development psychology, Social psychology, Emotional Intelligence

ID5214 Ethnic Cohesion and Peace Building (2 Credits)

Learning Outcomes: 1. Describe the nature of the discipline of peace and harmony 2. Apply the basic ideas of ethnic cohesion and peace building in every day social life 3. Recognize the importance of maintaining peace and harmony within and outside the university 4. Apply the concepts and practice in the organisational context

Course Contents: Introduction to Ethnic Cohesion and Peace Building, Attitudes and behaviours in living harmony, Conflict and conflict resolution, Reconciliation, Community Mediation Practices, Organisational conflict and Negotiation in practice

6.5 Modules offered by Department of Mechanical Engineering:

ME1301 Applied Mechanics (3 Credits)

Learning Outcomes: 1. Perform operations leading to numerical calculations in engineering mechanics. 2. Solve for unknown external and internal forces using equilibrium equations. 3. Solve for the properties to represent associated internal forces. 4. Use Work and Energy principles to solve static and dynamic problems. 5. Use Kinematic expressions to represent motion of particles and rigid bodies. 6. Solve 2-D dynamic problems by considering inertial forces and or impulse and momentum.

Course Contents: Introduction, Forces, Moments, Couples and Torques, Force analyses, Centroids of Plane Areas and Curves, Kinematics of Particles and Plane motion of a rigid body, Centroids and mass moments & Products of inertia of rigid bodies, Work Energy methods and Impulse Momentum for particles and rigid bodies, Rectilinear motion of a body, Dynamic unbalance, Gyroscopic moments, and vibrations.

ME1302 Engineering Drawing (3 Credits)

Learning Outcomes: 1. Prepare engineering drawings to express or communicate design ideas and concepts. 2. Produce orthographic projections of 3 – Dimensional objects. 3. Produce assembly drawings of complex engineering assemblies. 4. Interpret Civil and Electrical Engineering drawings for building services and other requirements. 5. Generate standard drawings to process, interpret and present engineering concepts and ideas using Computer Aided Drafting Software. 6. Produce Computer Aided Engineering Drawings of acceptable professional standard.

Course Contents: Introduction to Drawings, Geometrical Constructions, Orthographic and Isometric Projections, Assembly Drawings, Civil and Electrical Engineering Conventions, Introduction to CAD and Working with the Windows Environment, Viewing and Plotting a Drawing, Basic CAD Drawing Techniques, Creating Geometry, Editing Skills, Dimensioning a Drawing, and Using Symbols and Attributes.

ME1303 Engineering Materials and Processes (3 Credits)

Learning Outcomes: 1. Identify the structures of a wide range of engineering materials, including metals and alloys, polymers, ceramics and composites. 2. Describe the characteristic properties, applications and limitations of engineering materials in practical use. 3. Discuss the suitability of tools, equipment and machinery to perform various manufacturing process 4. Describe various metal removal and metal forming processes and their applications. 5. Describe various metal casting processes and their applications. 6 Choose suitable materials, fabrication processes in practice, and use principles of metrology for quality assurance

Course Contents: Basic Structures and Properties of Engineering Materials, Phase Equilibrium in Metal Alloy Systems, Polymeric materials, Ceramics, Composite Materials, Cutting and hand tools, Forms of metallic materials, Machining process, Metal forming, Metal casting, Fabrication, and Field visit.

ME1304 Thermodynamics and Fluid Mechanics (3 Credits)

Learning Outcomes: 1. Describe the basic principles of thermodynamics to analyse simple thermodynamic systems including cycles, 2. Analyse properties of pure substances and their principles through phase diagrams and phase rules and the application of First Law of Thermodynamics, 3. Describe limitations of First Law of Thermodynamics and the use of second law of thermodynamics and Power cycles, 4. Analyse the hydrostatic forces on submerged surfaces and stability of floating bodies, 5. Classify fluid flows and solve problems of steady inviscid one-dimensional fluid flow, and 6. Explain flow patterns and carry out velocity measurements.

Course Contents: Introduction to Thermodynamics, Properties of Pure substances and Ideal Gases, Second Law of Thermodynamics, Power Cycles and Refrigeration Cycle, Fluid statics, Fluid flow concepts, and Introduction to real fluid flows.

ME2301 Fluid Dynamics (3 Credits)

Learning Outcomes: 1. Calculate forces and moments by internal flows and flow jets, 2. Describe and analytically derive fluid flow fields using velocity, acceleration and flow patterns, 3. Explain and evaluate the effect of viscosity on typical incompressible flows of interest in engineering applications, 4. Calculate losses in pipe flows and design pipe networks, and 5. Plan and carry out physical model tests based on similarity.

Course Contents: Control volume analysis, Ideal Flows, Incompressible viscous flows, Pipe flow, and Dimensional analysis.

ME2302 Mechanics of Machines (3 Credits)

Learning Outcomes: 1. Describe and analyse the kinematics and kinetics of plane mechanisms using both analytical graphical methods, 2. Explain gear terminology and determine velocity ratios and forces in gear systems, 3. Describe the importance of balancing and analyse the unbalanced forces and couples of rotating and reciprocating masses using force polygon and couple polygon, 4. Describe the dynamics of flywheel and turning moment diagram, 5. Derive the equation of motion of 1 DoF and 2 DoF systems using a suitable technique and compute the natural frequency and other parameters of a system, and 6. Find the responses of undamped and viscously damped 1 DoF systems subjected to different types of harmonic force, including base excitation.

Course Contents: Planar Linkages, Gear Drives, Balancing, Turning Moment Diagram and Flywheel, and Vibrations.

ME2303 Mechanics of Materials (3 Credits)

Learning Outcomes: 1. Describe the basic concepts and laws of Mechanics of Materials and their application in the analysis and design of actual engineering structures and machine components, 2. Identify the relevance of these concepts in understanding the subject of Design of Machine Elements, 3. Apply modern experimental stress analysis techniques to measure strains and stresses in engineering components and structures, 4. Demonstrate knowledge and understanding of various failure mechanisms and the appropriate criteria for their assessment, 5. Apply this knowledge to Comprehensive Design Projects, and 6. Demonstrate the importance of safe design in problems of Mechanical Engineering interest.

Course Contents: Introduction to Stress and Strain, Constitutive Relationships, Two dimensional problems in Rectangular and Polar Coordinates, Three Dimensional States of Stress and Strain, Experimental Stress analysis, Failure Analysis, Stress concentration, Mechanics of Fracture, and Fatigue and Creep Failure.

ME2304 Applied Thermodynamics (3 Credits)

Learning Outcomes: 1. Describe the overview of laws of thermodynamics and their applications, 2. Analyse the performance of standard Vapour & Gas power cycles, 3. Analyse the performance of compressing & expanding work transfer devices, 4. Describe steady compressible fluid flow and related applications, and 5. Describe the basic combustion processes within the context of laws of Thermodynamics.

Course Contents: Overview of Laws of Thermodynamics, Vapor Power Cycles, Gas Power Cycles, Expanders, Compressors, Compressible Fluid Flow, and Combustion.

ME2305 Basic Controls and Instrumentation (3 Credits)

Learning Outcomes: 1. Understand the purpose and objectives of engineering control systems and instrumentation, 2. Mathematically model a physical system and analyse the performance and stability of the system, 3. Estimate the time response of a control system and errors, 4. Determine the application of different transducers, calculation of errors in measurement, 5. Determine the transfer functions of the sensors or t mathematically, and 6. Understand the PID controller theory and application.

Course Contents: Introduction, Feedback Theory, Time Response Analysis, Concepts of Stability, Classification of instruments & transducers, Design techniques for sensor signal conditioning, High impedance sensors, Positioning, motion and temperature sensors, and Proportional Integral and Derivative (PID) Controller.

ME2306 Design of Machine Elements (3 Credits)

Learning Outcomes: 1. Recognize the purpose and function of each member of a mechanical device, 2. Identify and select suitable materials for fabrication of various machine elements, 3. Design and develop appropriate structural elements for different devices, 4. Estimate the required load bearing capacities and the limitations of stress and strain in the design of machine elements, and 5. Design and develop a range of elemental machine components and modules for the assembly of a functional device or machines.

Course Contents: Introduction to Engineering Design, Selection of Materials for Machine Elements, Stresses in Machine Elements, Limits and Fits, Design of Machine Elements subjected to Variable Stresses, Design of Shafts, Levers, Screws; Fly Wheel Design, Springs, Methods of Fastening, and Keys, Splines and Couplings.

ME2307 Manufacturing Engineering (3 Credits)

Learning Outcomes: 1. Describe major manufacturing processes including cutting, deformation, joining and their associated machines, implements and tools, 2. Explain the manufacturing support systems, 3. Design products for manufacture, assembly and

quality, 4. Discuss the Operation and Control of a Manufacturing Systems, and 5. Describe the functions of a Manufacturing Engineer.

Course Contents: Introduction to Manufacturing Engineering and Systems, Design for Manufacture, Assembly and Quality, Lean and Agile Manufacturing, Process Planning, Metal Forming; Removal, Joining and Casting Processes, Powder Metallurgy and Rapid Prototyping, Forming and Shaping of Plastics and Composite materials, Elements of Machine Tool design, Assembly, and Micro-Fabrication and Nano-Fabrication Technologies.

ME3301 Fluid Machinery (3 Credits)

Learning Outcomes: 1. Describe the basic types of fluid machinery being used, their principles of operation and applications, 2. Describe the basic principles governing fluid flow to analyse simple fluid machinery, 3. Calculate the design parameters of fluid power systems, 4. Apply the control techniques of fluid power machinery and energy systems, 5. Estimate the energy potential in a water source of a hydro site, and 6. Design a fluid machinery for a hydro site.

Course Contents: Introduction to Fluid Power Machinery and their classifications, Positive displacement Pumps, their characteristics and applications; Rotodynamic Pumps, Agricultural and miscellaneous pumping devices; Hydro, Impulse, Reaction, Wind and Cross Flow Turbines, Operation of Pumps as Turbines (PAT), Estimation and Measurement of Potential of a hydro site, Axial Fans and Propellers and Centrifugal Fans and Blowers.

ME3302 Heating Ventilation Air-Conditioning & Refrigeration (3 Credits)

Learning Outcomes: 1. Describe the basic heating systems used in industrial applications, 2. Explain the basic heat pump cycle, describe properties of refrigerants used and their environmental impacts, 3. Explain the aspects of human thermal Comfort and Indoor Air Quality (IAQ) in buildings, 4. Describe commonly used refrigeration and air-conditioning systems and their layouts, and 5. Carryout preliminary sizing of sub-systems of commonly used refrigeration & air-conditioning systems.

Course Contents: Basic Heating Systems, Vapour Compression Cycles, Psychrometry, Human Thermal Comfort and IAQ, Cooling Load Estimation, and Building Air-conditioning.

ME3203 Machine Dynamics (2 Credits)

Learning Outcomes: 1. Describe the important principles of three dimensional kinematics and kinetics of rigid bodies, 2. Solve three dimensional problems of kinetic and kinematic of rigid bodies, 3. Describe the causes and effects of vibration on mechanical equipment based on the fundamentals of mechanical vibration, and 4. Analyse the dynamic response of a multiple degree of freedom vibrating mechanical systems.

Course Contents: Three Dimensional Kinematics of Rigid Bodies, Three Dimensional Kinetics of Rigid Bodies, Vibrations of Two Degree of Freedom Systems and Multi Degree of Freedom Systems.

ME3204 Operational Research (2 Credits)

Learning Outcomes: 1. Identify and develop operational research models from the description of the real system, 2. Demonstrate the mathematical tools that are needed to solve optimization problems, 3. Apply different steps of decision making processes, and 4. Apply a number of basic techniques in Operations Research.

Course Contents: Linear Programming, Duality Theory, Revised Simplex Method, Sensitivity Analysis, Parametric Programming, Integer Programming, Transportation Model, and Assignment Model.

ME3305 Mechanical Engineering Design I (3 Credits)

Learning Outcomes: 1. Apply scientific knowledge in determining units, forces, and power & energy calculations for design requirements, 2. Conduct a proper need analysis and direct design activities towards solving problems identified, 3. Develop innovative solutions to real problems, 4. Show concern for human factors when designing your product /equipment, machine or a plant, 5. Carryout a comprehensive design task and select appropriate materials for components, and 6. Communicate design information through technical reports, engineering drawings, computer representations, real communication, etc., and 7. Demonstrate the ability to work as a team to manage a comprehensive design project

Course Contents: Fundamentals for Mechanical Engineering Design, Product Design and Workshop Practical, Design Synthesis, Methodology and Optimization, Design for Manufacture, Assembly and Quality, Conceptual Design, Ergonomics, Selection of materials, Detailed design calculations, Geometric modelling, Production Drawings, Computer Aided Engineering CAE), and Project.

ME3306 Automobile Engineering & Automotive Technology (3 Credits)

Learning Outcomes: 1. Describe the construction and operating principles of systems, sub systems and main components of an automobile, 2. Use analytical techniques to solve automotive engineering problems, and 3: Critically evaluate and appreciate the application of new technologies and changes in automobile engineering practice.

Course Contents: Introduction, Automotive Engines, Fuels and Fuel Systems for Automobile Engines, Automobile electrical system, Automotive Power Train, Electric and Hybrid Power Trains, Automotive Steering and Suspension Systems, Alternative Fuels for Automobiles, Advanced Automotive Systems, Automobile safety, and Electronic Ignition Systems.

ME3307 Production and Operations Management (3 Credits)

Learning Outcomes: 1. Identify issues in organisations in relation to production and operations management, 2. Plan facilities for production systems, and 3. Analyse and solve basic engineering problems associated with production systems to improve productivity.

Course Contents: Introduction to production and operations management, Production and sales forecasting, Production planning, Material requirement planning; Production scheduling and Inventory control, Quality management, Work study, and Facilities planning.

ME3308 Mechanical Engineering Design II (3 Credits)

Learning Outcomes: 1. Demonstrate the knowledge on fundamentals of Mechanical Engineering Design, 2. Integrate knowledge in design of machine elements and any other relevant subject to design mechanical systems for an intended purpose, 3. Design mechanical engineering systems to relevant engineering standards, 4. Analyse in detail the present conditions and level of industry and technology in operation, and innovate a design strategy accordingly to suit the specific situations and environment, 5. Conduct feasibility analysis, economic and financial aspects, market survey of products and machinery, 6. Communicate design information through technical reports, engineering drawings, computer representations, real communication, market pitch etc., and 7. Demonstrate the ability to work as a team leader to manage a comprehensive design project.

Course Contents: Design brief, Introduction to Mechanical Engineering Design, Design Methodology and Optimization, Conceptual Design, Problem identification, Concept generation & selection, Ergonomics, and Selection of materials; Market Pitch, Detailed design, and Project.

ME3309 Mechatronics (3 Credits)

Learning Outcomes: 1. Define Mechatronics systems, components and their characteristics, 2. Apply the basics of theory, operation, design and application of sensors and actuators, 3. Analyse the effects of component interconnection and the overall behaviour of Mechatronics systems, 4. Analyse the operation of latches, flip-flops, multiplexors, decoders, counters, registers and use them in implementing digital systems, 5. Use computer tools for system data acquisition, data analysis and to programing using microprocessors and microcontrollers, 6. Implement computer-based monitoring and control for Mechatronics systems using virtual instrumentation software, and 7. Ascribe the fundamentals and applications of Micro/Nano Electro Mechanical Systems (MEMS/NEMS).

Course Contents: Introduction to mechatronic systems, Sensors and sensing technologies, Actuators, principles, applications, Signal conditioning and Data Acquisition systems, Digital Electronics, Microprocessors and Microcontrollers, Virtual instrumentation, and Micro-Mechatronic Systems.

ME4201 Human Factors Engineering (2 Credits)

Learning Outcomes: 1. Identify issues in organisations in relation to human factors engineering, 2. Match user abilities, skills, and attitudes with work, 3. Value the importance of displays at workplaces, 4. Demonstrate concern about the effects of environmental issues, safety and health of people, 5. Use the concepts learned in class in design of products and processes, and 6. Apply this knowledge to design safe workplaces.

Course Contents: Introduction to human factors engineering, Presentation and comprehension of information, Workplace design, Human output and control, Environmental conditions, and Applications of human factors.

ME4402 Final Year (Design/Research) Project -Part 1 (4 Credits)

Learning Outcomes: 1. Describe the process of applying scientific research and design to the solutions of complex engineering problems utilising a system approach, 2. Research on a given problem using engineering fundaments, 3. Plan and schedule a design/ research project incorporating key project management components, 4. Execute a design / research project through innovative methods, conclude it through a scientific approach, 5. Demonstrate a sound technical knowledge of the selected project topic through innovative product development in engineering spheres, and 6. Demonstrate independent learning ability, communicate with engineers, and the community at large through presentation and report writing skills.

Course Contents: Problem analysis and need Identification, Researching the need, Formulation of concepts and selecting a promising concept, Select a promising concept and conduct optimization, and Research report preparation and presentations.

ME4403 Final Year (Design/Research) Project -Part 2 (4 Credits)

Learning Outcomes: 1. Describe the process of applying scientific research and design to the solutions of complex engineering problems utilising a system approach, 2. Research on a given problem using engineering fundaments, 3. Plan and schedule a research project incorporating key project management components, 4. Execute a research project through innovative methods, conclude it through a scientific approach, 5. Demonstrate a sound technical knowledge of the selected project topic through innovative product development in engineering spheres, and 6. Demonstrate independent learning ability, communicate with engineers, and the community at large through presentation and report writing skills.

Course Contents: Problem analysis and need Identification, Researching the need, Formulation of concepts and selecting a promising concept, Select a promising concept and conduct optimization, Build a prototype, and Research report preparation and presentations.

ME4304 Building Services Engineering (3 Credits)

Learning Outcomes: 1. Describe goals and general attributes of Building Services Engineering (BSE) and interdisciplinary nature of the subject area, 2. Recognize basic terms in building lighting systems and suitable light sources for the applications, 3. Design a suitable lighting arrangement as per the customer requirements for domestic and commercial buildings, 4. Demonstrate the knowledge of Indoor Air Quality and selection of a suitable HVAC system for buildings, 5. Describe practices of plumbing and of efficient water resource utilization related to buildings, 6. Design water storage tanks and septic tanks as per customer requirements and the local regulations for domestic houses, 7. Describe practices of electricity distribution and ancillary services related to buildings, 8. Explain the practices of building waste management, on-site renewable energy generation and green buildings, and 9. Explain the basics of building related firefighting systems, acoustics and control and automation systems.

Course Contents: Introduction to BSE, Lighting System, HVAC and Internal Air Quality, Plumbing and Water Efficiency, Electricity Distribution and lightning protection system

and Ancillary Services, Building Acoustics, Building Controls and Automation, Fire safety systems in buildings, and On site Renewable Energy Generation Waste Disposal and Management

ME4305 Maintenance Management (3 Credits)

Learning Outcomes: 1. Describe the concepts of effective maintenance of plant and equipment, 2. Ensure cost-effective utilisation of assets, 3. Demonstrate competence in productive maintenance concepts, 4. Plan and design an effective maintenance programme, and 5. Acquire best plant and equipment whenever replacement / enhancement of capacity is required.

Course Contents: Introduction, Objectives of Maintenance and its Costs, Availability, Performance and Productivity, Availability Performance in different Production Systems, Maintenance Definitions and Procedures, How to get Unplanned Repair Jobs Planned, Failure Development, Maintenance Procedures and Life, Cycle Cost, Total Productive Maintenance, Maintenance Management Systems, Inspection Systems and their Implementation.

ME5301 Computational Fluid Dynamics (3 Credits)

Learning Outcomes: 1. Explain potential application of CFD and mathematical Equations governing the fluid flow problems, 2. Explain classification of flows and Turbulence models used by CFD, 3. Describe discretisation techniques of governing equations of fluid flows, 4. Explain different numerical methods, solution algorithms and the basic structure of CFD code, and 5. Analyse the complex fluid flow problems using a commercial software.

Course Contents: Introduction to computational fluid dynamics, Conservation laws of fluid motion and boundary conditions, Turbulence modelling, Overview of CFD techniques, Finite volume method for diffusion and diffusion-convection problems, Finite volume discretisation, multi-dimensional grids, solution algorithms, Finite volume method for unsteady flows, Boundary conditions in the discretised equations of the FVM, and Advanced applications of CFD, Use of commercial software and CFD project.

ME5302 Heat and Mass Transfer (3 Credits)

Learning Outcomes: 1. Describe the basic principles and mechanisms of heat transfer and mass transfer, 2. Analyse the conduction heat transfer mechanism, 3. Analyse the convection and radiation heat transfer mechanism, 4. Describe the boiling and condensation heat transfer, and 5. Analyse the various kinds of heat exchangers.

Course Contents: Introduction to Heat Transfer, Conduction Analysis, Convection Analysis, Radiation Analysis, Boiling and Condensation, Heat Exchangers, and Introduction to Mass Transfer.

ME5303 Fluid Power Systems (3 Credits)

Learning Outcomes: 1. Discuss the application of fluid power systems in various industries, 2. Recognize the different components and hydraulic fluids used in a fluid

power system and their functions, 3. Describe the internal parts and actuation & operation principles of individual, components of a fluid power system, 4. Estimate the fluid resistance and energy losses in a hydraulic circuit and power requirements, 5. Analyse characteristics of hydraulic circuits with different hydraulic pump-motor combinations, 6. Design fluid power circuits including all necessary components for industrial applications, and 7. Analyse the operations of designed hydraulic circuits with simulation software.

Course Contents: Introduction to Fluid Power Transmission Systems, Hydraulic Fluids, Ancillary Hydraulic Devices, Pumps, Actuators, and Valves; Theoretical Modelling of Flow Control Systems, Hydraulic Circuits, and Practical Fluid Power Systems, Introduction to Fluid Power circuit simulation software and Hydraulic Circuit Design Work.

ME5204 Energy Sources (2 Credits)

Learning Outcomes: 1. Identify the types of energy sources in the present global context, 2. Characterize the resource/reserve base of each energy source type and their future trends, 3. Understand and analyse the supply-demand scenario of energy with reference to the local context, and 4. Evaluate the general impact on the environment in using energy sources.

Course Contents: Overview of the Energy Scenario, Earth Energy Cycle, Reserves and Resources, Formation of Fossil Sources, Conversion Technologies related to Fossil and Mineral Sources, Description of Renewable and Alternative Energy Sources, Environmental Impact, and Emission Reduction Mechanisms.

ME5305 Energy Conservation (3 Credits)

Learning Outcomes: 1. Describe the role, current and future global trends of energy conservation, 2. Explain the standards and labels related to energy conservation, 3. Describe various aspects and best practices of energy conservation commonly used in thermal and electrical systems, 4. Describe various aspects and best practices of energy conservation commonly used in fluid machinery and buildings, 5. Conduct and energy audit for a simple system within the perspective of an overall energy management program, and 6. Design and evaluate the effectiveness and energy conservation of a system.

Course Contents: Introduction to Energy Conservation, Energy Conservation in Thermal Systems, Energy Conservation in Electrical Systems, Energy conservation in Fluid machinery, Energy Conservation in Buildings, Energy Audit, Energy Management, and Economic Analysis.

ME5306 Renewable Energy Technologies (3 Credits)

Learning Outcomes: 1. Identify and Describe the types of Renewable Energy sources in the present global context, 2. Analyse in detail the types of Renewable Energy resource potential and their applicability in the local context, 3. Analyse and Evaluate the applicability of Renewable Energy technologies in the local context including basic economics, and 4. Apply this knowledge to design Energy Systems to integrate available renewable energy sources.

Course Contents: Overview of Renewable Energy Sources, Solar Energy Technologies, Wind Energy Technologies, Biomass Energy Technologies, Small Hydro Energy Technologies, and Miscellaneous Renewable Energy Technologies.

ME5207 Environment & Sustainability (2 Credits)

Learning Outcomes: 1. Apply the basic principles of environmental science to assess technology, 2. Evaluate the impact of modern human development on the environment, 3. Evaluate social and environmental concerns in development planning, and 4. Describe the practices and conventions on the environment and development

Course Contents: Basic Principles of Environmental Science, Impact of human development on the environment, Social and Environmental considerations in Sustainability, and Practices and Conventions on the environment and development.

ME5208 Furnace Technology (2 Credits)

Learning Outcomes: 1. Identify the type of furnaces required for different applications and purposes, 2. Design furnaces effectively for the use of suitable materials and equipment for energy conservation, 3. Familiarize with different types of refractory materials used for the construction of furnaces, 4. Develop understanding about the major furnaces and kilns used in the Sri Lankan industries, and 5. Apply the knowledge gained for designing furnaces for various applications and solve problems relating to furnace design, furnace materials, and continuous use.

Course Contents: Introduction to Furnaces, Furnace construction techniques, Evolution of Furnaces, Construction Materials, Components, Equipment, Energy conservation in furnaces, Furnaces of importance used in Sri Lanka, and Designing a furnace.

ME5309 Introduction to Agricultural Engineering (3 Credits)

Learning Outcomes: 1. Apply the basic principles of soil-water-plant relationship to assess farming conditions, 2. Analyse and solve basic water management problems under rain-fed and irrigated agriculture, 3. Apply the basic principles of structural engineering to plan retaining structures for farm use and water retention, and 4. Analyse and solve basic engineering problems associated with waste management in agriculture.

Course Contents: Properties of soils, Hydrology, Soil-water-plant relationship, Soil erosion, Farm structures, and Agricultural wastes and by-product utilization.

ME5310 Agricultural Plant and Machinery (3 Credits)

Learning Outcomes: 1. Explain the types of machines used for different agricultural operations, 2. Estimate work rates, tractor power and number of ploughs in tillage operations, 3. Demonstrate the understanding of different parts of an agricultural tractor and methods of attaching implements, 4. Describe soil parameters that are of importance to field operations, 5. Demonstrate the understanding of soil failure criteria, factors affecting the soil strength, slip-thrust relationship of tractor tyres and methods of enhancing traction.

Course Contents: Introduction to Agricultural Machines, Engine power for agriculture, Traction, and Agricultural Tractor.

ME5311 Postharvest Technology (3 Credits)

Learning Outcomes: 1. Apply the basic principles of postharvest technology to analyse simple postharvest systems including minimal processing, 2. Analyse and solve problems involving storage of fresh produce, 3. Apply the basic principles governing fresh produce to analyse systems to extend shelf-life, 4. Analyse and solve basic drying and cold storage/freezing problems associated with fresh produce.

Course Contents: Introduction to Postharvest Technology, Food Chemistry and physiology, Principles of food processing, Food quality and evaluation, Food microbiology, and Equipment for processing.

ME5212 Robotics and Industrial Automation (2 Credits)

Learning Outcomes: 1. Carry out kinematic and dynamic analysis of the operation of industrial robots, 2. Integrate industrial systems such as manufacturing cells using robot manipulators, 3. Program and configure industrial robots with vision capabilities in industrial systems, 4. Investigate the kinematics of mobile robot platforms, 5. Design industrial automation solutions using standard industrial controllers and mechanical components; and 6. Program PLC's for common industrial automation requirements.

Course Contents: Overview of industrial robots, Kinematics of multilink manipulators, Robot manipulator dynamics, Trajectory planning and control for robot manipulators, Operating and programming industrial robot manipulators, Mobile Robots, Industrial automation, and PLC-controlled automation systems.

ME5313 Mathematical Modelling (3 Credits)

Learning Outcomes: 1. Apply laws of nature to develop mathematical models for dynamical systems and to analyse and simulate them and predict the behaviour, 2. Conduct appropriate models for systems using system identification methodologies and optimization, 3. Describe the frequency domain analysis and optimization, and 4. Explain the nonlinear system systems and phenomena.

Course Contents: Introduction, Model Development using laws of nature, Linear Systems and Models, Simulation, Non-linear system, Signal models and Noise models, Discrete time systems, Frequency domain analysis of dynamical system, Introduction to Optimization, Systems Identification, and Advance non-linear models for systems and phenomena.

ME5214 Computer Integrated Manufacturing (2 Credits)

Learning Outcomes: 1. Explain concepts of automation and computer-integration in the context of manufacturing systems engineering, 2. Explain the working principles of CAD systems, 3. Develop basic computer solutions requiring graphical representation and manipulation of 3D solid objects, 4. Develop program codes for computer numerical control machines, 5. Use CAM software for process planning and generation of NC code, and 6. Select integration components and implement system integration to realize integrated manufacturing systems.

Course Contents: Introduction to Computer Integrated Manufacturing, Fundamentals of Computer Aided Design Systems, Computer Numerical Control, Computer Aided Manufacturing, and Integration using Computer Technology.

7 EVALUATION CRITERIA

7.1 Evaluation

7.1.1. Performance of student in each module will be evaluated by Continuous Assessment (CA) and End of Semester Examination (ESE).

7.1.2. Senate on the recommendation of the Faculty will approve the Examiner (1st Examiner) and assign a Moderating Examiner (2nd Examiner) for each module conducted in a semester.

7.1.3. CA component in a module normally carries a weightage of not less than 20% and not more than 50% of the total marks, except in training, camps, research projects and other similar modules, where ESE may be replaced by another form of end of module evaluation for which prior approval must be obtained from the Faculty.

7.1.4. CA of a student may be based on a specified combination of assignments including laboratory work, tutorials, quizzes, presentations and participation in the module activities as appropriate.

7.1.5. Weightage of each of the components used in the determination of the final grade for each module will be conveyed to the student by the Examiner at the commencement of each module along with the outline of the module. For repeat candidates, the current weightage of each component of the module should be used in determining the final grade.

7.1.6. The eligibility of the candidates to sit for ESE is based on the satisfactory participation in the module. To be considered to have satisfactorily followed a module, a student in general to should have 80% attendance based on the total number of equivalent lecture hours of the module. At the end of semester, the list of eligible students for each module in that semester will be sent to the Examination Division by the Coordinator of the module through the Head of the Department for Specialization Programme or Academic Advisors for the Common Core Programme.

7.1.7. To pass a module, a candidate shall obtain at least 35% from each of the CA and ESE components.

7.1.8. If only one of the components is passed, the student has to complete only the remaining component by registering as a repeat candidate in the next attempt in order to complete the module. The marks obtained for the passed component will be kept on records and taken to determine the grade at the repeat attempt.

7.1.9. The students failing both CA and ESE receive a grade F, and should re-do both components in order to upgrade the result.

7.1.10. The highest grade obtainable at a repeat attempt is the grade C except when an academic concession has been granted to sit written examinations as a first attempt candidate.

7.1.11. Board of Examiners comprising Vice-Chancellor, Dean, Heads of Departments, and Examiners of all the modules relevant to a particular semester of the programme will meet at the end of each semester to decide on the performance and the academic standing of each student registered for that semester of the programme.

7.2 Grading System

7.2.1. Grades are generally awarded on a relative basis within the minimum and maximum grades of F and A for all modules. The numerical equivalence of the grades (Grade Points) and corresponding Indicative Benchmark Percentages are presented in Table 7.1.

Table 7.1 – Grading System

Indicative Benchmark Percentages (refer Section 7.2.2)	**Grade***	**Grade Points***	**Description**
85 and above	A^+	4.00	
80 – 84	A	4.00	Excellent
75 – 79	A^-	3.70	
70 – 74	B^+	3.30	
65 – 69	B	3.00	Good
60 – 64	B^-	2.70	
55 – 59	C^+	2.30	
50 – 54	C	2.00	Pass
45 – 49	C^-	1.70	Conditional Pass
40 – 44	D^+	1.30	
35 – 39	D	1.00	
Both ESE and CA components 34 and below	F	0	Fail
**In accordance with UGC Circular No: 901*			

7.2.2. Indicative benchmark percentages are given for reference and may be changed upwards or downwards by the moderator in consultation with the examiner in accordance with Faculty guidelines.

7.2.3. Grades will satisfy the following criteria.

i. The grade **D** or above is required to earn credit for a module.

ii. A student failing either CA or ESE receives an incomplete grade **I-CA** or **I-ESE** respectively**,** and is required to repeat only the failed component.

iii. A student failing both CA and ESE receives an **F** grade, and must repeat both components. The maximum grade awarded for repeating a module will be a **C** and it will be used for calculating SGPA.

iv. Grade **N** signifies Academic Concession granted with the approval of the Faculty, in the event a student is unable to sit for the ESE due to illness or other compelling reason accepted by the Senate. In such instances the student must make an appeal, with supporting documents, to the Dean for an Academic concession strictly following the procedures laid out by the Senate. CA component can be carried forward to the next available examination as the first attempt. The grade is not counted in the calculation of SGPA.

v. Grade **W** indicates a module withdrawn by the student with the approval of the Faculty and the Senate. The grade is not counted in the calculation of the SGPA. If a student later decides to register for a withdrawn module, he/she will be considered as a repeat candidate with an F grade for the module

vi. The grades **F, I, D, D$^+$** or **C$^-$** can be improved up to a **C** grade and considered for calculating SGPA. Students who wish to upgrade need to complete their examinations and obtain the upgraded grade before the relevant final board of Examiners.

7.2.4. The grade achieved for each module will be entered on the student's permanent record. Any subsequent upgrade to any grade will override the grade obtained at a previous attempt in the permanent record.

7.3 Non-GPA Modules

7.3.1. Of the total requirement for graduation, six credits should be earned through modules designated as Non-GPA modules (Industrial Training).

7.3.2. The grades earned for Non-GPA modules will not be taken for the purpose of calculating the SGPA, CGPA, and OGPA or in the award of Class Honours.

7.4 Unsatisfactory Standing

7.4.1. If the student's SGPA falls between 1.50 and 1.99 the student will be placed on Academic warning.

7.4.2. Any student with a SGPA less than 1.50 will be placed on Academic probation.

7.4.3. Academic Probation and/or Academic Warning may be withdrawn when the relevant SGPA is upgraded to 2.00 or more.

7.4.4. A student on Academic Warning or Academic Probation who falls into one of the following categories due to failure to upgrade the SGPA **will not be permitted to register for a new module until the SGPA improves as required**.

i) SGPA< 1.50 in any two semesters (02 Academic Probations)

ii) SGPA< 1.50 in any semester (01 Academic Probation), and 1.50 ≤SGPA< 2.00 in any two semesters (02 Academic Warnings)

iii) 1.50≤SGPA< 2.00 in any four semesters (04 Academic Warnings)

7.5 Award of Class Honours

7.5.1. Awarding of Class Honours is determined at the completion of all the graduation requirements **within four academic years**. OGPA obtained in **the Specialization Programme** (Semesters 3 to 8) will be used for awarding of Class Honours as follows.

OGPA in the Specialization Programme	Academic Standing*
3.70-or Above	First Class
3.30-3.69	Second Class- Upper Division
3.00-3.29	Second Class- Lower Division
2.00-2.99	Pass
**In accordance with UGC Circular No: 901*	

7.5.2. For a student considered under Section 5.8 and or a student under exceptional circumstances, who has satisfied the OGPA requirements but has taken longer than four academic years to complete the course requirements, may be deemed to be eligible for the award of BSc Engineering with a class by the Senate on the recommendation of the Faculty.

7.6 Academic Concession

7.6.1. A student who has missed an ESE or any other course requirements because of illness or other compelling reason may appeal with supporting documents to the Dean for an Academic Concession for the approval of the Senate.

7.6.2. In case of a written examination, the student should submit an application with supporting documents within the time period specified under the Clause on Absence from Examination of By-Law. In instances where a student misses any other academic activity such as CA, the student should submit the application with supporting documents before the last date of academic activities of the relevant semester.

7.7 Dean's List

7.7.1. A student of any program in the faculty could be admitted to the dean's list each semester if the student achieves a GPA equal to or more than 3.70 in a semester. Such a placement will also be noted on the Student's Academic Transcript. Dean's List will be published annually.

8 GRADUATION REQUIREMENTS

8.1 Minimum Residence Requirement

8.1.1. A student enrolled for the BSc Engineering degree has to follow the program of study as a full-time student for a period extending over a minimum of four academic years.

8.2 Credit and GPA Requirements

8.2.1. A candidate should satisfy the following requirements in order to be admitted to the BSc Engineering degree:

(a) Successful completion of the Common Core Programme.

(b) Securing a minimum of total of 150 Credits including minimum of 144 GPA Credits and 6 Non-GPA Credits from among the modules specified for the relevant field of specialization and the Common Core Programme. If a student secured more than 150 Credits with Optional / Elective modules, the relevant and best grades obtained up to 150 Credits will be used to calculate GPA. A minimum OGPA of 2.00 in **the Specialization Programme**, Grade in any of the modules is not below D, and the Cumulative Credit Deficit (CCD) does not exceed 15.

CCD = $\sum \boldsymbol{n_i}\, \boldsymbol{d_i}$ for all modules with grade of D, D^+ or C^- ;

where $\boldsymbol{n_i}$ is the number of credits of a module in which the student has secured a grade of D, D^+ or C^-, and $\boldsymbol{d_i}$ is the deficit weightage, defined as 1 for a D, 2/3 for a D^+ and 1/2 for a C^-.

(c) Credit requirements specified in the curriculum for the specialization as approved by the Senate, and

(d) Completion of any other mandatory requirements prescribed by the Senate.

8.3 Maximum Allowed Duration of Study

8.3.1. A candidate will not qualify for the award of the BSc Engineering degree if the approved graduation requirements are not satisfied **within eight academic years** from the date of first registration.

8.3.2. Under medical grounds the Senate may grant permission to extend the duration of study beyond the maximum allowed duration by an amount not exceeding the approved leave on medical grounds.

8.3.3. Under exceptional circumstances other than medical grounds, the Senate may grant permission to extend the maximum allowed duration of study by not more than one additional academic year on the recommendation of the Faculty.

8.4 Modules from Other Institutions

8.4.1. Normally students are expected to complete their programs through modules taken at the South Eastern University of Sri Lanka. Students who wish to take a module elsewhere should obtain written permission from the Faculty of Engineering before registering for the module, to ensure that it is acceptable for credit.

8.4.2. It is the responsibility of the student to ensure that an official transcript of grades is forwarded directly to the Senior Assistant Registrar (Academic / Examination) of the South Eastern University of Sri Lanka in order that the appropriate grade to be recorded. To receive credit, normally a minimum grade of C (equivalent to at least 50%) must be obtained for a module.

8.5 Effective Date of Award

8.5.1. The effective date of the award of the degree shall be reckoned as the first day of the month following the satisfactory completion of the graduation requirements, as confirmed by the Senate, and set out in Section 8.

9 ACADEMIC AWARDS

The following medals and prizes are annually awarded to the outstanding students graduating from the Faculty of Engineering who achieve the prescribed criteria for the medals or prizes approved by the Senate. Awarding of medals for the best performance will be noted on student's transcript.

9.1 Gold Medals

The following Gold Medals are awarded to engineering students at the University General Convocation:

1. **Gold Medal for the best overall performance in Engineering** awarded to the graduating student who is eligible to be awarded with First Class Honours and has obtained the highest overall GPA for Semesters 1 to 8.
2. **Gold Medal for the best performance in Civil Engineering** awarded to the graduating student who is eligible to be awarded with First Class Honours and has obtained the highest Overall GPA in the field of Civil Engineering (Semesters 3 to 8).
3. **Gold Medal for the best performance in Electrical and Electronic Engineering** awarded to the graduating student who is eligible to be awarded with First Class Honours and has obtained the highest Overall GPA in the field of Electrical and Electronic Engineering (Semesters 3 to 8).
4. **Gold Medal for the best performance in Mechanical Engineering** awarded to the graduating student who is eligible to be awarded with First Class Honours and has obtained the highest Overall GPA in the field of Mechanical Engineering (Semesters 3 to 8).

9.2 Prizes

The following prizes are awarded to engineering students at Faculty level events:

Prizes for Civil Engineering Specialization

1. **Prize for Structural Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects CE2302 Structural Analysis, CE2306 Design of Structures I, CE3301 Design of Structures II, CE3313 Finite Element Methods.
2. **Prize for Geotechnical Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects CE2303 Geomechanics I, CE2307 Geomechanics II, CE3302 Geotechnical Engineering, CE3309 Geotechnical Engineering Design.
3. **Prize for Water and Environmental Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects CE2309 Engineering Hydrology, CE3303 Hydraulic Engineering, CE3310 Hydraulic Design, CE3307 Environmental Engineering, CE3312 Water and Wastewater Engineering.

4. **Prize for Highway and Traffic Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects CE3304 Highway Design and Traffic Engineering I, CE3311 Highway Design and Traffic Engineering II.
5. **Prize for Surveying** awarded to the student with the highest GPA but greater than 3.30 for the subjects CE2305 Engineering Surveying I, CE3305 Engineering Surveying II, CE3106 Survey Camp.
6. **Prize for Project Management** awarded to the student with the highest GPA but greater than 3.30 for the subjects CE3308 Construction Management, ID4301 Project Management.

Prizes for Electrical and Electronic Engineering Specialization

1. **Prize for Electrical and Application Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects EE3310 Power Systems I, EE3308 Electrical Installations, EE3362 Electrical Machines & Drives I, and EE4310 Power Systems II.
2. **Prize for Communication Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects EE3370 Communication Theory, EE3374 Communication Systems I, and EE4370 Communication Systems II.
3. **Prize for Electronic and Control System Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects EE3350 Power Electronics, EE3380 Control Systems, EE4380 Robotics, and EE4350 Mechatronic Applications.
4. **Prize for Electromagnetic Engineering** awarded to the student with the highest GPA but greater than 3.30 for the subjects 5. EE2206 Electromagnetics, EE2307 Introduction to Electrical Machines & Power Systems, and EE3206 Applied Electromagnetics.

Prizes for Mechanical Engineering Specialization

1. **Prize for Thermo Fluids** awarded to the student with the highest GPA but greater than 3.30 for the subjects ME2304 Applied Thermodynamics, ME5301 Computational Fluid Dynamics (E), ME5302 Heat & Mass Transfer (E), and ME5303 Fluid Power Systems (E).
2. **Prize for Energy Technology** awarded to the student with the highest GPA but greater than 3.30 for the subjects ME5204 Energy Sources (E), ME5305 Energy Conservation (E), ME5306 Renewable Energy Technologies (E), and ME5207 Environment & Sustainability (E).
3. **Prize for Robotics and Mechatronics** awarded to the student with the highest GPA but greater than 3.30 for the subjects ME3203 Machine Dynamics, ME3309 Mechatronics (C), and ME5212 Robotics and Automation (E).

9.3 Governing Criteria for the Medals and Prizes

1. The Faculty Board will appoint an Awards Committee in each academic year to finalize and recommend the candidates for the medals and prizes.
2. The total number of medals and prizes to be awarded in a particular academic year shall be decided by the Awards Committee appointed by the Faculty Board.
3. Gold Medals will be awarded at the university convocation and prizes will be awarded at faculty level events.
4. The prizes are awarded only to the graduating students who are eligible to be awarded with minimum Second Class Lower Division and satisfy the specific criteria for the prize.
5. In the event of a tie for the Gold Medal for the best overall performance in Engineering, the Faculty Board shall select the most suitable candidate based on their merits, contributions and involvements in the University extra-curricular activities. In the event of a tie for the Gold Medal for the best performance in the respective field of specialization, the Faculty Board shall select the most suitable candidate based on their overall GPA for Semesters 1 to 8. In the event of a tie for the prizes, Faculty Board will select the most suitable candidate based on the Weighted Average Marks (WAM) of the respective subjects.
6. For a prize that requires certain elective module(s), the most suitable candidate should be selected from among the candidates who completed all the specified elective modules or completed at least the offered elective modules specified for the prize.
7. The final selection of the recipients of medals and prizes shall be confirmed for each batch of engineering students by the Senate based on the recommendation of the Faculty Board.

10 REGULATIONS RELATED TO EXAMINATION PROCEDURES, OFFENCES AND PUNISHMENTS FOR EXAMINATIONS CONDUCTED

Prepared under section 135 of the Universities Act No. 16 of 1978 as amended by the Universities Amendment Act No. 07 of 1985 and approved by the University Senate on 13th February 2019. This By-Law shall come into force on 13th March 2019.

10.1 Rules pertaining to the Conduct of Examinations:

10.1.1. A candidate shall have fulfilled the attendance requirement of 80% as prescribed in order to be eligible to sit the examination of a course. The candidate should submit a medical certificate in support of his/her absence to lectures within two weeks after commencement of his/her absence. The medical certificate shall confirm to the regulations given under Section 10.2.1.

10.1.2. Candidates shall be present at the Examination Hall at least 15 minutes before the commencement of each paper and shall enter the Hall only when they are requested to do so by the Supervisor.

10.1.3. On the admission to the Examination Hall, the candidates shall occupy the seats allocated to them.

10.1.4. No candidate shall have in his person or in his clothes or on the admission card, time table and record book or on any other object that is permitted to be brought to the examination hall any notes, signs, diagrams of formula or any other unauthorized materials. Books, notes, parcels, file covers, bags, mobile phones, electronic devices etc. which the candidate has brought with him should be kept at a place indicated by the Supervisor or invigilators. A calculator may be allowed only for the subjects for which it is permitted.

10.1.5. No candidate shall be admitted to the examination hall after the expiry of half an hour from the commencement of the examination nor shall a candidate be allowed to leave the hall until half an hour has elapsed from the commencement of the examination or during the last 15 minutes of the paper.

10.1.6. A candidate shall bring into the examination hall his/her Student Record Book or his/her University Identity Card which should bear the candidate's photograph~~y~~ and his/her signature duly certified by the Registrar or the Authorized officer. If there is a discrepancy between the names indicated in the Record book or the Identity Card and the name under which the candidate appears for the examination the candidate shall produce a certificate endorsed by the Registrar to the effect that both names refer to one and the same person. In the absence of the above proof of identity, a candidate may produce his or her National Identity Card or a recently taken photograph~~y~~ duly certified by an authorized person. If a candidate fails to produce the student record book or the university identity card, he/she shall sign a declaration in respect of the paper for which he/she had not produced and produce the student record book or the university identity card within the next three working days. If a

candidate has lost his/her student record book or the university identity card during the examination period, he/she shall obtain a duplicate of student record book or the university identity card as the case may be from the Registrar or Senior Assistant Registrar/Academic for production at the examination hall.

10.1.7. A candidate also shall bring the admission card on every occasion he/she presents himself/herself for a paper.

10.1.8. A candidate may be requested by the Supervisor to declare any items in his or her possession or person.

10.1.9. No candidate can either lend or borrow any material from any other candidate or attempt to communicate in any manner with another candidate or copy from the script of any other candidate. No candidate shall attempt to help another candidate or conduct him / her negligently so that another candidate has the opportunity of copying.

10.1.10. No candidate shall copy or attempt to copy from any book or paper or notes of similar material or from the scripts of another candidate. No candidate shall watch any practical examination performed by him/her. No candidate shall use any other unfair means or obtain or render improper assistance at the examination.

10.1.11. If any candidate was found to have copied from another candidate by an examiner at the time of marking, he/she would be treated as having committed a punishable offence.

10.1.12. Candidates shall write only on the writing paper issued during the current paper on that particular date and session.

10.1.13. Examination stationary (i.e. writing paper, graph paper, drawing paper, ledger paper, precise paper etc.) will be supplied as and when necessary. No sheet of paper or answer book supplied to a candidate may be torn, crumpled, folded or otherwise mutilated. No papers other than those supplied to him / her by the Supervisor / invigilator shall be used by candidates. Log tables or any other material provided shall be used with care and left behind on the desk. All materials supplied, whether used or unused, shall be left behind on the desk and not removed from the examination halls.

10.1.14. Every candidate shall enter his / her Index Number on the answer book and every continuation sheet, before using such answer book or continuation sheet. No candidate shall write his/her name or any identifying mark on the answer script. Any candidate who inserts on his script an Index Number other than his / her own is liable to be regarded as having attempted to cheat.

10.1.15. A script that bears no index number / registration number of has an index number / registration number which cannot be identified, is liable to be rejected. No candidate shall write his / her name or any other identifying mark.

10.1.16. All calculations and rough work shall be done only on paper supplied for the examination and shall be cancelled and attached to the answer script. Such work should not be done on admission cards, time table, question papers, record books or on any other paper. Any candidate who disregards these instructions runs the risk of being considered as having written notes or outline of answers with intention of copying.

10.1.17. Every candidate shall conduct himself/herself in the examination hall and its precincts so as not to cause disturbance or inconvenience to the Supervisor or his staff or to other candidates. In entering and leaving the hall, he/she shall conduct himself/herself as quietly as possible. A candidate is liable to be excluded from the examination hall for disorderly conduct.

10.1.18. No candidate shall submit a practical or field book, dissertation, thesis, project study, model or product, a programme or software, answer script or assignment which has been done wholly or partly by anyone other than the candidate himself / herself. In terms of group projects, input from group members only are allowed.

10.1.19. A Candidates shall bring his/her own pens, ink, mathematical instruments, drawing instruments, erasers, pencils or any other approved equipment or stationery which he / she has been instructed to bring. No candidate shall bring a programmable calculator into the examination.

10.1.20. No person shall impersonate a candidate at the examination nor shall any candidate allow himself / herself to be so impersonated by another person.

10.1.21. The supervisor/invigilator is empowered to require any candidate to make a statement in writing on any matter which may have arisen during the course of the examination and such statement shall be signed by the candidate. No candidate shall refuse to make such a statement or to sign it

10.1.22. Candidates shall stop work promptly when ordered by the Supervisor / invigilator to do so.

10.1.23. Absolute silence shall be maintained in the examination hall and its precincts. A Candidate is not permitted to communicate or to have nay dealings with any person other than the Supervisor / Invigilator(s). Attention of the Supervisor /Invigilator shall be drawn by a candidate by raising the hand from where he/she is seated.

10.1.24. During the course of answering a question paper no candidate shall be allowed to leave the examination hall temporarily. In case of any emergency, the Supervisor/Invigilator may grant permission to do so but the candidate will be under his/her surveillance.

10.1.25. No candidate shall impersonate a candidate at the examination nor shall any candidate allow himself/herself to be impersonated by another person.

10.1.26. Any candidate receiving unauthorized assistance from any person shall be deemed to have committed an examination offence.

10.1.27. No candidate shall contact any person other than the Vice Chancellor, Dean, Head of Department or AR/SAR/DR Examination regarding any matter concerning the examination.

10.1.28. Every candidate shall hand over the answer script personally to the Supervisor/Invigilator or remain in his / her seat until it is collected. On no account shall a candidate hand over his/her answer script to an attendant, a minor employee or another candidate.

10.1.29. A candidate who is registered for a course unit shall sit for the examination unless he/she has withdrawn the registration within the prescribed period for dropping course units. The candidate should submit a medical certificate in support of his/her absence, prior to the commencement of the examination. If such a certificate cannot be submitted before the commencement of the examination, the candidate shall inform his/her inability to attend the examination in writing preferably by registered post to the Dean of the faculty within two weeks after commencement of the examination with a valid medical certificate. The medical certificate shall confirm regulations given under Section 10.2.

10.1.30. A student who is found guilty of an examination offence shall not be eligible for class honours.

10.1.31. No student shall sit an examination of a course if he/she has exhausted the number of attempts that he/she is allowed to sit that particular examination, unless he/she has been granted special permission to do so by the Senate with the recommendation of the relevant Faculty Board.

10.2 Regulations pertaining to acceptance of Medical Certificates submitted by students

10.2.1. Students are required to support their absence for lectures, practical classes, field works, study tours, field visits, etc. and examinations due to illness by a valid medical certificate confirming to the format of a medical certificate issued by a government hospital. Such medical certificate should be obtained from the following persons:

University Medical Officer
District Medical Officer
Consultant Specialist in the particular field
Head of Government Base Hospital
Medical Superintendent of a Provincial Ayurvedic / Homeopathic Government Hospital

Medical certificates issued by private hospitals of registered private practitioners could be considered by the University Medical Board.

10.2.2. Student who falls ill during semester or examination time should contact the University Medical Officer at the University Health Centre immediately.

10.2.3. If a student fall sick at home or elsewhere during semester or examination time the student or his/her guardian should inform the Dean of the respective Faculty within seven (07) days by tele-mail/fax/email or other means followed by a letter indicating the nature of the illness and the name of the doctor attending to illness. A medical certificate supporting the illness also should be sent to the Dean. If a student could not submit the medical certificate within seven days, he/she may appeal to the Faculty Board with a medical certificate within two weeks in case of a private medical certificate and within one month in case of a government medical certificate.

Upon receipt of the medical certificate(s), the Dean should follow the following procedures:

10.2.3.1 In case of a Western Medical Certificate is submitted

a. The medical certificate should be referred to the University Medical Officer for his/her observation and recommendation.
b. The University Medical Officer if wishes may summon the student for examination and thereafter send his/her observations and recommendations to the Dean.
c. In cases where the University Medical Officer wishes to convene the Western Medical Board he/she may make arrangements to convene the Board and refer the recommendation of the Board to the Dean.
d. The Dean upon receipt of the recommendations, should forward it to the Faculty Board for ratification.

10.2.3.2 In case of an Ayurvedic Medical Certificate is submitted

a. Ayurvedic medical certificates submitted by student(s) should be circulated among the members of the Ayurvedic Medical Board for their observations by the AR/SAR of the Faculty under the guidance of the Dean of the respective Faculty.
b. Each member of the Ayurvedic Medical Board may send his/her observations and recommendations on the face of the medical certificate to the Dean of the respective Faculty through the AR/SAR of the Faculty.
c. In case where the opinions of the members of the Board vary, the AR/SAR of the Faculty with the consultation of the Dean of the Faculty may convene a meeting of the Board.
d. The Board may examine the documentary evidence provided or may summon the student and examine the student concerned.
e. Recommendation of the Board should be sent to the Faculty Board through the Dean of the faculty for ratification.
f. The originals of the medical certificates submitted should be kept in the files in the Faculty while copies of the certificates should be sent to the University Medical Officer for the purpose of records.

10.2.3.3 There shall be two medical boards, viz. Western Medical Board and Ayurvedic Medical Board

a. Western Medical Board

- The Western Medical Board shall consider the cases where the University Medical Officer has doubt about the validity of the medical certificate upon which the request of students to be excused for absence from lectures etc. or examination.
- Medical Officer of the University shall convene the Board if and when necessary.
- Board has the right to call students before the Board when necessary for the purpose of interview, examination and investigations.
- Recommendations of the Board should be sent to the Faculty Board through the Dean of the respective Faculty.
- The Board should consist of a physician, surgeon, a psychiatrist and the University Medical Officer.

b. Ayurvedic Medical Board

- This Board shall consist of three (03) persons appointed by the Senate of the University.
- This Board may consider Ayurvedic medical certificates submitted by students requesting exemption from examination or lectures etc. and make recommendations to the Senate through the Dean of the respective Faculty.
- The Board shall meet at least once within a semester. The SAR/academic in consultation with the Deans of respective Faculties shall convene the Board whenever necessary.
- Board has the right to call students before the Board when necessary for the purpose of interview, examination and investigations. The SAR / Academic should request the students' presence at the Board.
- Recommendations of the Board should be sent to the Faculty Board through the Dean of the respective Faculty.
- Caution should be exercised when accepting the Ayurvedic Medical Certificates. Medicals should only be considered from those who are registered under the Ayurvedic Medical Council.
- General or special registered Ayurvedic Medical Practitioners could recommend, on any one occasion, leave upto14 days at a stretch. Those with more than the above amount should get an endorsement from the Medical Officer in Charge of the closest Government Ayurvedic Hospital or Government Ayurvedic Dispensary.

- The Board may decide on the number of days recommended for leave even though recommended in the Ayurvedic medical certificate.
- The Board has the right to question the validity of any Ayurvedic Medical Certificate.
- The Board has the right to summon any student submitting Ayurvedic Medical certificates, if necessary.

10.3 Procedure for inquiry and determination of punishment due to those found guilty of examination offences

Examination offences shall be reported by the supervisor of the examination to Senior Assistant Registrar / Examination Branch. This will be inquired by the Examination Offences Committee appointed by the Vice Chancellor. The findings of this Committee will be reported to the Senate. The Senate shall after consideration of the report, determine the punishments due to those found guilty of the examination offences.

10.4 Examination Offences and Punishments

Any candidate who violates examination rule 1.4 shall be deemed guilty of the offence of procession of unauthorized documents/items and his/her candidature for the examinations of that semester shall be cancelled and he/she shall be prohibited from sitting any examination of this University for a period varying from 1 – 5 semesters.

Type of Offences	**Recommended Punishments**
1. Name written on Answer Scripts	Written warning
2. Possession of bag etc. on or near desk	Written warning
Possession in his/her person or in his/her clothes or on the admission card, time table and record book or on any other object that is permitted to be brought to the examination hall any notes, signs, diagrams of formula or any other unauthorized materials, books, notes, parcels, file covers, bags, mobile phones, electronic devices etc. which the candidate has brought with him/her (10.1.4)	a. The admission card on which that particular exam paper falls will be cancelled. This implies that the particular paper and all the other exam paper/s mentioned in the given admission with this particular paper will be cancelled. b. Prohibited from sitting any examination of this university for a period from 1 to 4 semesters. c. This candidate will not be eligible for class awarding. d. These all cancelled exam papers will be considered as repeat papers in future. e. And any other punishments recommended by the Senate

Use any information devices in the Examination hall	a. The admission card on which that particular exam paper falls will be cancelled. This implies that the particular paper and all the other exam paper/s mentioned in the given admission with this particular paper will be cancelled. b. Prohibited from sitting any examination of this university for a period from 1 to 4 semesters. c. This candidate will not be eligible for class awarding. d. These all cancelled exam papers will be considered as repeat papers in future. f. And any other punishments recommended by the Senate
Attempt to copy from any unauthorized material (i.e. book or paper or notes of similar material etc.) (10.1.10) or copy from the script of any other candidate. (10.1.9) or watch any practical examination performed by another candidate (10.1.10).	a. The admission card on which that particular exam paper falls will be cancelled. This implies that the particular paper and all the other exam paper/s mentioned in the given admission with this particular paper will be cancelled. b. Prohibited from sitting any examination of this university for a period from 1 to 4 semesters. c. This candidate will not be eligible for class awarding. d. These all cancelled exam papers will be considered as repeat papers in future. e. And any other punishments recommended by the Senate
Attempting to help another candidate or conduct him / her negligently so that another candidate has the opportunity of copying. (10.1.9)	a. The admission card on which that particular exam paper falls will be cancelled. This implies that the particular paper and all the other exam paper/s mentioned in the given admission with this particular paper will be cancelled.
If any candidate was found to have copied from another candidate by an examiner at the time of marking (10.1.11)	The admission card on which that particular exam paper falls will be cancelled. This implies that the particular paper and all the other exam paper/s mentioned in the given admission with this particular paper will be cancelled.

Disruption of examination or cause disturbance or inconvenience to the Supervisor or his staff or to other candidates (10.1.17) Not abiding by the instructions provided by the supervisor, invigilator or violates the general rules and regulations of examinations.	A candidate is liable to be excluded from the examination hall for disorderly conduct. The admission card on which that particular exam paper falls will be cancelled. This implies that the particular paper and all the other exam paper/s mentioned in the given admission with this particular paper will be cancelled. Other punishments stipulated in the UGC Comm. Circular 946
Impersonate a candidate at the examination or allow himself / herself to be so impersonated by another person. (10.1.25)	Whenever found while sitting for a particular paper and if it is by a student a. Debarment for two years and to be referred to disciplinary action. If the student in final year, debarment period depends on duration on completion of degree program and b. The admission card on which that particular paper falls will be cancelled. This implies that the particular paper and all the other paper/s mentioned in the given admission with this particular paper will be cancelled and c. This candidate will not be eligible for class awarding and d. These all cancelled papers will be considered as repeat papers in future. e. And any other punishments recommended by the Senate - If by an outsider, prosecution to be initiated and any other punishments recommended by the Senate Impersonator/s may also be liable to any punishment under the Penal Code/Criminal Law. In the event the impersonator is found to be a graduate of this University, his/her degree shall be withdrawn.
Copying an assignment, project work	Assign zero marks and written warning. And any other punishments recommended by the Senate

Aiding and abetting Lending or borrowing any material from any other candidate or attempt to communicate in any manner with another candidate (10.1.9)	Whenever found while sitting for a particular paper, a. The admission card on which that particular paper falls will be cancelled. This implies that the particular paper and all the other paper/s mentioned in the given admission with this particular paper will be cancelled. b. This candidate will not be eligible for class awarding. c. These all cancelled papers will be considered as repeat papers in future. d. And any other punishments recommended by the Senate
Removal of University stationary and material (10.1.13)	Written warning by the supervisor with a copy placed in personal file. If found guilty for the same offence again, a. The admission card of the current examination will be cancelled. This implies that all the paper/s mentioned in the given admission card will be cancelled. b. Prohibit from sitting examination of this University for a period of 1 semester.
Attempt to obtain improper assistance	Cancellation of the paper and severe warning issued in writing with a copy in the personal file.
Not carrying out the Instructions of the Supervisor at the examination hall	Written warning by the supervisor with a copy placed in personal file. If found guilty for the same offence again, a. The admission card of the current examination will be cancelled. This implies that all the paper/s mentioned in the given admission card will be cancelled. b. Prohibit from sitting examination of this University for a period of 1 semester. c. Other punishments stipulated in the UGC Comm. Circular 946

Submitting a practical or field book, dissertation, thesis, or project study, model or product, a programme or software, or answer script or assignment which has been done wholly or partly by anyone other than the candidate himself / herself. (Plagiarism) (10.1.18)	The examination of that particular subject will be cancelled. In terms of plagiarism in thesis or project work, the thesis or project work will not be accepted nor evaluated. The candidate has to repeat the same in a different attempt, which will be considered as a repeat attempt. and Prohibit from sitting examination of this University for a period of 2-4 semesters.
Any candidate receiving unauthorized assistance from any person shall be deemed to have committed an examination offence. (10.1.26)	The admission card of the current examination will be cancelled. This implies that all the paper/s mentioned in the given admission card will be cancelled. and Prohibit from sitting examination of this University for a period of 2-4 semesters.
Any other offences which are not covered in the above sections reported to the relevant authority by a supervisor or examiner	Inquired into and appropriate actions taken.

10.5 Procedure Regarding Examination Offences Committed by Candidates

10.5.1. Disciplinary Committee

There shall be an examination disciplinary committee consisting of all the deans of the University. The committee should be convened within two weeks by the AR/SAR/DR of Examination branch upon the receipt of a complaint. The committee should inquire into the complaint and make recommendations including punishments based on this guideline and other rules and regulations of the University within a one week of meeting the committee. The report of the committee should be tabled at the next Senate for necessary actions

10.5.2. Procedure

10.5.2.1 In all cases of violation of examination rules, the supervisor shall take action to forward his complaint / report to the Examination Branch (to AR/SAR/DR) through the Dean.

10.5.2.2 When the supervisor detects disorderly conduct of a candidate, in the first instance, he should warn the candidate to behave properly. If the conduct of a candidate is causing disturbance to the examination or if the candidate

behaves continuously in a manner which is disturbing the examination, the supervisor may exclude the candidate from the examination hall and issue a letter with copies to the respective Dean, AR/SAR/DR examination and the AR/SAR of the respective Faculty cancelling his/her candidature

10.5.2.3 In all cases of detecting examination offences, the supervisor should send a report to the relevant Dean with a copy to the AR/SAR/DR Examination along with all relevant material including material taken into custody. All the materials taken into custody, should be authenticated by keeping signatures of the candidate, supervisor and an invigilator. The report of the supervisor should be counter signed by an invigilator

10.5.2.4 The Dean, after a preliminary inquiry, will submit his/her recommendations to the AR/SAR/DR examination to place the same at the disciplinary committee for further actions

10.5.2.5 Any officer of the University (i.e. examiner, head, lecturers etc.) who detects an examination offence should report it to the relevant Dean who shall after a preliminary inquiry should submit the report to the AR/SAR/DR examination to place the same at the disciplinary committee for further actions. Any allegation or complaints received from any one on examination offences should be investigated initially by the relevant Dean and with his/her report, it should be tabbed at the disciplinary committee

10.5.2.6 The AR/SAR/DR should serve as the convener of the disciplinary committee

10.6 The Decision

The decision(s) of the disciplinary committee should be submitted to the Senate for a decision and the Senate should ratify the decisions.

10.7 Appeal Procedure

10.7.1. The Vice Chancellor may appoint an appeal board consisting three members among Senior Professors, Professors or Associate Professors.

10.7.2. Any student on whom a punishment is imposed may appeal within two weeks from the date of communication of the punishment. The appeal should be addressed to the Vice Chancellor.

10.7.3. The appeals board may review the decision regarding the punishment imposed and may either affirm or revise the punishments and refer back to the Senate.

11 GENERAL INFORMATION

11.1 Faculty Colour

The official colour of the Faculty of Engineering is ***violet*** (R:G:B = 148,0,211).

11.2 Student Registration

All students who are admitted to the university are required to register themselves before commencing their course of studies each academic year. Students are requested to submit duly completed registration form together with all relevant documents to the Academic and Examination Division of the University on or before the specified date.

11.3 Issue of Student Record Book and Identity Card

On completion of registration, the University will issue every student a Student's Record Book and an Identity Card bearing his / her photograph duly embossed with the seal of the University. Every student must carry his / her record book or identity card whilst in the University premises, and is required produce such record book or identity card when called upon to do so by any member of the academic, administrative or security staff of the University.

11.4 Renewal of Registration

All Students who continue their course of studies during their second and subsequent years are required to renew registration at the commencement of each academic year on or before the date notified. Forms for renewal of registration are made available at Academic and Examination Division or the Office of the Dean. The form for renewal duly completed together with Paying in Voucher bearing the bank seal as proof for the payment of fees prescribed by the University should be submitted to the office of the Dean on or before the closing date.

11.5 Payment for Registration

Details of fees are given below and the payment should be credited to the South Eastern University of Sri Lanka, **Account No. 228-100190001704**, People's Bank, Addalaichenai through any branch of the People's Bank. Such fees payable may vary subject to decisions of the University.

Existing Fees Payable for Initial Registration by all Students

- Registration Fees: 300/-
- Library Fee 250/-
- Medical Fee 250/-
- Hand Book 300/-
- Sports Facilities Fee 200/-
- Student ID Fee 100/-
- Student Charter Fee 100/-
- Laboratory Deposit: 500/-

Those seeking Hostel Accommodation should pay an additional Fee

- Key Deposit 500/-
- Hostel Admission Fee 600/-
- Hostel Fees (per year): 1300/-

Fee for Renewal of Registration for all Students

- Renewal fees: 110/-
- Medical fees: 50/-
- Identity card: 100/-
- Fees for repeat courses (per course):25/-
- Loss of Identity card: 300/-
- Loss of Record Book: 300/-

11.6 Common Learning Facilities and Resources in the University

Department of English Language Teaching (DELT)

The DELT is functioning under the Faculty of Arts and Culture. However, this unit offers English Language Courses to the entire university student population to enhance their proficiency in English Language. During the pre-academic term, Intensive English Programme is conducted by the DELT with the help of visiting instructors and academics. In addition, the DELT is conducting the English classes for engineering students during the Common Core Programme.

University Library and Museum

The University Main Library (http://www.seu.ac.lk/library/index.php) with state-of-the-art facilities has 51,120 square feet floor area. It has seating capacity for about 400 persons and provides many facilities such as Digital Knowledge Centre, Research Centre, Centre for Special Needs, Cyber Centre, Leisure Reading, and 24 Hours Open Access Centre for Group Study in addition to the traditional library services. The Library has implemented Integrated RFID Technology Access Control System and fully automated Library Services to enable the users to receive world-class facilities and services.

The University Library delivers customer focused quality information products, services and programmes, creatively adjusts to changing information needs and innovatively responds to new challenges at national and international level. The objective of the library is to effectively support the University in achieving standards of excellence in its academic programmes, research and other activities. More specifically, its goal is to provide access to scholarly information in support of the teaching, learning and research activities of the university, as they relate to the curricula.

At present the library possesses a total print collection of items over 133,000 including books, pamphlets, and audio-visual materials and e-resources needed for learning, teaching and research. The University Library recently purchased a large number of

textbooks which support the teaching and learning interest of faculties. Patrons can borrow these books for a longer period of time.

The Library subscribes to a number of Electronic Databases to provide access to scholarly Journal Collection. The University has also developed Digital Library (E-Repository / Institutional Repository). Institutional Repository is an online digital collection of scholarly output. It includes faculty publications, research materials, rare materials, images, audio and video outputs, theses and conference proceedings.

The Cultural Museum is an integral part of the South Eastern University Library. It is a "General Museum", depicting the heritage of Sri Lankan Societies. This cultural museum was established to strengthen and support the overall culture, tradition and norms of different communities of Sri Lanka. It promotes cross-cultural awareness and communications between Sri Lankan people of different communities.

Student Support Service and Welfare (SSSW)

The Student Support Service and Welfare (SSSW) is a central entity, which is located at the main campus to which the students and others could bring their grievances and issues and seek solutions and relief. Similarly, it oversees the coordination and cohesion among several service divisions and units to ensure smooth functioning of the system, to remedy shortcomings and deficiencies, and to extend assistance for the students in need.

SSSW encompasses six broader areas, namely;

- Student services,
- Student accommodation and cafeteria services,
- Common amenities and services such as recreational and sports facilities,
- Curative and preventive health care services,
- Facilities for social, cultural, creative and aesthetic pursuits,
- Student welfare, grievance redress and counselling system.

The SSSW will coordinate the entities providing the above services with university authorities and faculty level student counseling system, Career Guidance Services, and Marshal and Security services to provide needed support to the students. Further, SSSW will entertain any complaints/problems/grievances from students as regard to food and lodging and financial, education and health matters etc., and provides assistance to needy students in liaison with relevant divisions / units.

Career Guidance Unit

Career Guidance is an interpersonal process designed to assist individuals with career development problems. Career guidance (also referred as vocational guidance, occupational counselling, and vocational counselling) is the assistance given to students and job seekers in choosing and preparing for a suitable job. Career Guidance Unit of the University conducts career related programmes in many thematic areas including: Counselling and advising on careers, employability skills enhancement, career-related

information provision, networking with the industries, availing work experience, entrepreneurship skills development, and conducting seminars, conferences, workshops, exhibitions, festivals, industry days, career fairs, out bound training, etc.

University Business Linkage Cell (UBL Cell)

University Business Linkage Cell (UBL Cell) of SEUSL was established in 2017, and functions under the guidance of its Director and the UBL Cell Manager. The UBL Cell aims to enhance the capacity of the university to identify and implement research and projects to develop innovative business-oriented products and processes. This Cell has established a Young Entrepreneurs' Society to empower the entrepreneurship culture within the undergraduates. Further, an Innovation Q Plus initiative was commenced with an objective to empower prior art search and patent filing to the academics and the students.

The UBL Cell has been organizing workshops and boot camps in collaboration with many industries and companies. Similarly, the Technology and Innovation and Support Centre (TISC) of the UBL cell provides innovators to access technology information and related services, helping them to exploit their innovative potential and to create, protect and manage their intellectual property rights. The UBL cell is also mandated to promote Intellectual Property (IP) policy at the universities. In order to promote research cooperation between businesses organizations and the university, the UBL Cell establishes close cooperation with regional businesses and providing students with real industry related projects.

UBL-Cell Director:

Dr. M.N. Ajmal Hinas BSc Eng (Hons) *(PDN),* PhD *(QUT),* AMIE *(SL)*

5G Innovation Center

With the deployment of 5th Generation (5G) Wireless Communication systems in Sri Lanka by Dialog Axiata PLC, 5G Innovation Centre at the faculty of engineering, SEUSL was established in 2021. The centre promotes state of the art research in telecommunications and smart city enabled with information technology, machine learning and Artificial Intelligence (AI), in partnership with Dialog and its partner organizations across Sri Lanka. Faculty of engineering received a 5G base station and 5G wireless router equipment from Dialog for research purposes. Since the inception of the centre, the students and staff at the faculty of engineering, SEUSL have been actively involved in the R&D outcomes so as to launch on Dialog platforms as tangible products. The centre opens up avenues to perfect the student and staff project outcomes for commercialization with the support of Dialog and its partners. The students and staff at the faculty of engineering get exposure to real world engineering problems in the industry.

Director:

Prof. M.A.L.A. Haleem BScEng (Hons) *(PDN),* MPhil *(HKUST),* PhD *(SIT-USA),* AMIE *(SL),* SM-IEEE *(USA)*

Other Facilities and Services

The students have access to many other facilities in the campus such as Health Centre, Student's Common Room, Places of Worship, Multi Shop, Sporting Facilities, and number of Canteens attached to different facilities in the university, which provide a conducive environment that enable students to effectively carry out academic and non-academic activities.

11.7 Students Involvement in Professional and other Bodies

11.7.1 Professional Bodies

IESL Students Chapter

The Students Chapter of the Institution of Engineers Sri Lanka (IESL) was established at the Faculty of Engineering in 2014 to foster links with professional bodies and industries, and carry out IESL activities for undergraduate students in the University. The activities of the Students Chapter are coordinated by the Young Members Section (YMS) Committee of the IESL, and the members of the YMS Committee include student members from universities as well as the Corporate and Associate Members of the IESL below 40 years of age. The YMS plays a key role in representing the wishes of engineering students and young engineers in the IESL Council and its activities.

The key activities of the YMS at SEUSL include:

- Career guidance and motivation programmes for engineering undergraduates and school students in the region,
- Organising entrepreneurship and business development programme for the engineering undergraduates,
- Providing industrial exposure through field visits to projects and industries for its members,
- Social welfare activities such as service learning projects in the regional schools, and
- Promoting innovation and environmental sustainability through community based engagements.

The YMS at SEUSL has been an active member of YMS events at the national level. Every year, the YMS through its Students Chapters in the universities conducts programs such as innovation challenge competitions, showcasing undergraduate projects in Techno Exhibitions, and Technical Conferences. The YMS at SEUSL has been the lead organizer of Drone Competition over the past years in the Techno Exhibitions.

IESL Liaison Officer:
Dr. J.A. Shiran Pradeep Jayakody BSc Eng (Hons) *(MRT),* PhD *(QUT),* AMIE *(SL),* APES (*SG*)

IEEE Student Branch of SEUSL

IEEE is the world's largest professional association for the advancement of technology. An IEEE Student Branch creates professional networking opportunities, builds critical skills and helps to develop the academic career. IEEE Student Branch of South Eastern University was established on 23rd March 2021, with the total number of 49 members. IEEE student branch of SEUSL provides opportunities to meet fellow IEEE Student and Graduate Student Members and engage with professional IEEE members. It offers numerous educational, technical, and professional advantages through special projects, events, activities, meetings, competitions and field trips. Key activities and programs of IEEE student of SEUSL can be listed as follow:

- Participation in regional conferences, workshops and competitions
- Development of leadership, interpersonal and team building skills
- Participation in awards, scholarships and project/design programs and student paper contests
- Access IEEE online services and resources

In addition to that IEEE offers many programs and projects that keep student interested in the Branch and its activities.

11.7.2 Students Societies and Committees

SEUSL has many student societies (university-level, faculty-Level, and department level) operated by the internal students. Most of the societies have got approvals from the university administration and other new societies are in their formative stage. The student societies functioning at the university level include:

- South Eastern University Student Union
- Tamil Sangam
- Sinhala Literacy Association
- Muslim Majlis
- Good Shepherd Youth Society
- Hindu Society
- Tamil Music Circle

The following societies are actively functioning at the Faculty of Engineering:

- Engineering Faculty Students' Union
- Civil Engineering Society (CES)
- Electrical Electronic Engineering Society (EES)
- Mechanical Engineering Society (MES)
- Agni Edge Media Club
- Communication Club
- Canteen Committee

Engineering Faculty Students' Union

The Engineering Faculty Students' Union was established in 2014 by the first batch of engineering undergraduates enrolled at the SEUSL. It functions as the collective voice of the engineering undergraduates and represents them in the academic, administrative, and welfare matters of the students with the Faculty administration. The members of the Union are selected annually and one of the senior academics is assigned for the post of Senior Treasurer of the Union to advise and moderate its activities. The Union regularly holds meetings with the Faculty administration including Dean, Deputy Registrar, the Heads of the Departments, and Faculty Student Counsellors to discuss and solve academic and welfare problems of students.

Civil Engineering Society (CES)

The Civil Engineering Society (CES) of South Eastern University of Sri Lanka was established in 2014 with an aim of bringing the staff, students and the industry together in 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 organizes many activities ranging from seminars and field visits and competitions. These activities are intended to help student members to sharpen their organizational skills and broaden their horizons, while stimulating the theoretical knowledge that they acquire through the academic programme.

Electrical and Electronic Engineering Society (EEES)

Electrical and Electronic Engineering Society (EEES) was established in 2016 with the aim of fostering innovation and creating opportunities to Electrical and Electronic Engineering students to interact with the industry. The society has successfully organized flagship events and competitions within the university and outside. Some of the most successful events include drone competition, robotic exhibition, and PCB design competitions. The society has also arranged a series of guest lectures on trending topics in electrical and electronic engineering, since its establishment.

Mechanical Engineering Society (MES)

Mechanical Engineering Society (MES) was established in 2018 to develop innovation and social skills of the Mechanical Engineering students. It has arranged many field visits to the industries in the region and island wide. MES has been arranging industry related workshops to the Mechanical Engineering students by inviting Engineering Professionals from the Industry and also with the leading academics in Mechanical Engineering.

Agni Edge Media Club

Agni Edge Media Club was established in 2018 to provide an avenue for the students with outstanding media and ICT skills. The Agni Edge has created its own brand for excellence in media through its high quality photography and videography products which went beyond the Faculty of Engineering and extended its services to all faculties in the university. The Agni Edge media club has arranged many competitions in photography, music, video and short film competitions.