University of Colombo
School of Computing



MASTER DEGREE PROGRAMMES 2026

STUDENT HANDBOOK

UCSC

University of Colombo School of Computing

STUDENT HANDBOOK
MASTER DEGREE PROGRAMMES 2026

Master of Computer Science
Master of Science in Computer Science
Master of Information Technology
Master of Information Security
Master of Business Analytics
Master of Cybersecurity



Disclaimer

This handbook is compiled with information received up to March, 2026.

It is hereby informed this Handbook is only for general information and does not represent accurately the relevant By-Laws and Regulations.

Any information contained herein should be confirmed by reference to the relevant authority.

For the latest version of the handbook please visit our website

http://www.ucsc.cmb.ac.lk



Vision

Be a Global Leader in Computing Education, Advancing the Frontiers of Knowledge through Teaching, Learning and Research.

Mission

To advance and enhance computing studies, fostering international relations and collaborations, promoting cross-disciplinary research, producing socially responsible scholars with entrepreneurial skills, leadership qualities and integrity contributing to the national goal of promoting the country as the knowledge hub in the region.



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MESSAGE FROM THE VICE CHANCELLOR



It is with great pleasure that I extend my greetings to all students who are embarking on their postgraduate journey at the University of Colombo School of Computing. The publication of this Handbook for Master Degree Programmes 2026 marks an important milestone in your academic progression and serves as a comprehensive guide for those enrolled in the Master of Science in Computer

Science, Master of Computer Science, Master of Information Technology, Master of Information Security, Master of Cybersecurity, and Master of Business Analytics Degree Programmes.

The University of Colombo, as the oldest institution of higher learning in Sri Lanka, has long upheld a tradition of academic excellence, innovation, and national service. The School of Computing stands as a distinguished pillar within the University, reflecting decades of visionary leadership and commitment to advancing computing education in the country. From the establishment of the Institute of Computer Technology (ICT), the predecessor of the University of Colombo School of Computing, in 1987, to the formation of the School of Computing in 2002, the development of IT education within the University has closely paralleled the rapid evolution of global information and communication technologies.

The School owes much to the foresight and dedication of pioneers who recognized the national need for a fully-fledged institution dedicated to computing and information sciences. In this regard, I wish to acknowledge the late Professor V. K. Samaranayake, whose visionaryleadership laid the foundation for what has become one of the most sought-after centres for IT education in Sri Lanka. Today, the University of Colombo School of Computing is supported by a highly qualified academic staff led by Director Dr. D.A.S. Atukorale, many of whom hold doctoral degrees from internationally recognized universities and maintain professional affiliations with esteemed global bodies. Their expertise, commitment to research, and dedication to teaching ensure that our Postgraduate Programmes remain globally relevant and academically rigorous.

This Handbook has been carefully prepared to provide you with essential academic and administrative information, programme structures, regulations, and guidance necessary for your successful completion of studies. It will serve not only as a reference document but also as a roadmap throughout your academic journey. I encourage you to familiarize yourselves with its contents and make full use of the resources and opportunities available.

Pursuing a Master Degree at the University of Colombo School of Computing is indeed a golden opportunity to obtain a globally recognized qualification while contributing meaningfully to the advancement of knowledge and innovation in Sri Lanka and beyond. I urge you to broaden your intellectual horizons, engage actively in research and professional development, and uphold the highest standards of integrity and responsibility.

As you commence this new chapter, I wish you every success in your academic endeavors. May your time at the University of Colombo be both intellectually enriching and personally

rewarding.

Professor I. M. Karunathilake
Vice Chancellor
University of Colombo

MESSAGE FROM THE DIRECTOR



On behalf of the University of Colombo School of Computing (UCSC), it is my great pleasure to welcome you to the Master Degree Programmes for the academic year 2025/2026.

Postgraduate education in Computing at UCSC represents one of the most significant academic offerings under the University of Colombo. Our postgraduate programmes, which began in 1989, have a distinguished history spanning nearly four decades and have consistently set the benchmark for Computing education in Sri Lanka. Over the years, UCSC has established itself as the leading higher education institution in Computing in the country. This reputation is built upon the dedication and expertise of our highly qualified academic staff, including more than thirty senior lecturers holding doctoral qualifications. Both our academic and non-academic staff are deeply committed to supporting and guiding our students to ensure that they receive the highest quality educational experience.

Our strong collaborations with industry partners and our respected academic standing have enabled our graduates to access excellent career opportunities both locally and internationally. In addition, our internationally recognized research groups continue to contribute to the advancement of knowledge and innovation in the field of Computing. The curriculum of our postgraduate programmes is carefully designed inalignment with internationally recognized ACM/IEEE guidelines and the Sri Lanka Qualifications Framework (SLQF), ensuring that our graduates possess globally relevant knowledge, skills, and competencies.

The Master Degree Programme is designed for Computing graduates who wish to deepen their expertise while obtaining a prestigious postgraduate qualification from one of Sri Lanka's leading metropolitan universities. The programme provides a strong foundation for both professional advancement and future research pursuits.

As a Centre of excellence in higher education, UCSC remains committed to fostering an academic environment that supports innovation, critical thinking, and professional growth. Our strategic focus is on maintaining the highest academic standards, producing well-rounded graduates, and enhancing their employability in a rapidly evolving technological landscape.

On behalf of UCSC, I extend my warmest wishes for your success. We look forward to supporting you as you embark on this important chapter of your academic journey with UCSC.

Wish you all the best.

Dr. D A S Atukorale
Director,
University of Colombo School of Computing

AN APPRECIATION OF THE FOUNDER DIRECTOR OF THE UCSC

Vidya Jyothi Professor
V. K. Samaranayake (1939 – 2007)



Vanniarachchige Kithsiri Samaranayake was born on the 22nd of May 1939 and had his early education in Hewavitharana Vidyalaya, Rajagiriya, where his father was the principal and his mother was a teacher. He entered Ananda College in 1948 and then Royal College through a competitive examination in 1950.

Prof. V.K.Samaranayake entered the University of Ceylon to read for a degree in Science in 1956 having completed his secondary education at Ananda and Royal Colleges. He was selected to do a Special degree in Mathematics and obtained a First Class Honours degree in 1961.

Prof. Samaranayake entered the Imperial College, London in 1963 on a state scholarship for his postgraduate studies and then moved on to University College, London to complete his PhD in record time before returning home in 1966. At the age of just 35, in recognition of his great scholarship, the University of Colombo appointed him to its highest Academic position of Professor of Mathematics in 1974. He was subsequently appointed Senior Professor of Mathematics in 1984, invited to be the first Senior Professor of the newly created Chair in Computer Science in 1996 and appointed Emeritus Professor of the University of Colombo after his retirement in 2004. In recognition of which the University honoured him with the title Professor Emeritus of Computer Science, and conferred on him the Degree of Doctor of Science, Honoris Causa at its subsequent Convocation.

As it is not possible to confine the appreciation of his enormous service to the nation and his illustrious career as an academic and an administrator to a few pages, some of the significant milestones of his illustrious career are outlined below.

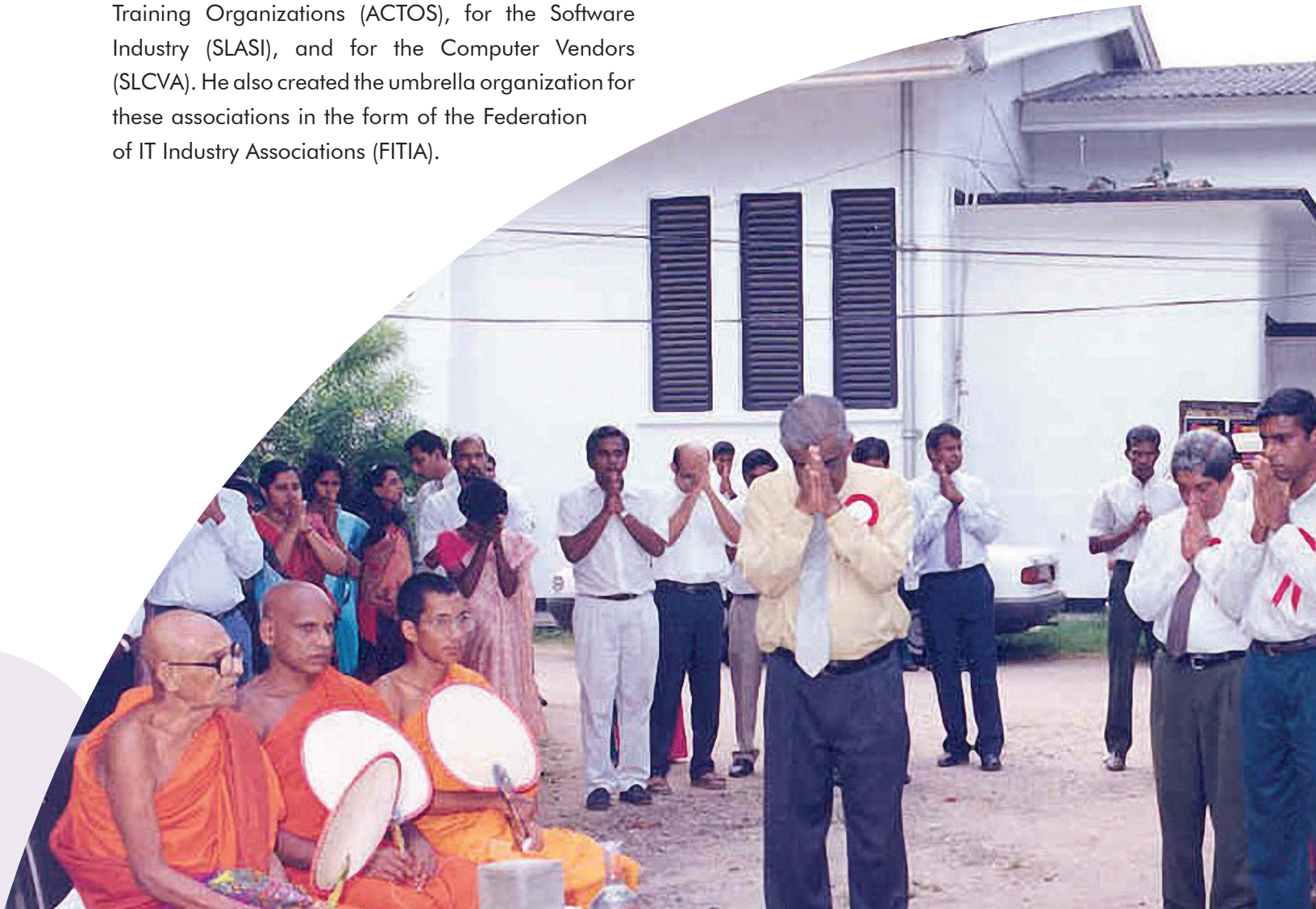
- 1987 - 1999 he held the position of the Chairman of the Computer and Information Technology Council of Sri Lanka (CINTEC). During this period he was also tasked with chairing the Presidential Task Force on Integrated R & D in Science & Technology 1997-2000 and the National Y2K Task Force in Sri Lanka 1998-2000.

- 1992 - He initiated the participation of Sri Lankan school children in Computer Programming, by committing CINTEC funds for sending teams of 4 to the International Olympiad in Informatics (IOI).

- In 1995 he was instrumental in setting up intensive discussions with Sri Lanka Telecom, to commence Internet services in Sri Lanka. These discussions eventually brought LEARN and Internet connectivity to Sri Lanka in 1996.

- He was instrumental in forming the IT for Computer Training Organizations (ACTOS), for the Software Industry (SLASI), and for the Computer Vendors (SLCVA). He also created the umbrella organization for these associations in the form of the Federation of IT Industry Associations (FITIA).

- In 1984 he was successful in building up Academic Faculty in Computer Science at the University of Colombo. Starting with the Statistical Unit, the Statistical Computing and Data Processing Centre within the Mathematics Department, Prof. Samaranayake first convinced the University to set up a Department of Statistics and Computer Science in 1985, the first of its kind in Sri Lanka, and then went onto create the first School in the university system in the form of the University of Colombo School of Computing (UCSC) in 2002.









- Commencing in the year 2000, Prof. Samaranayake initiated another major milestone in ICT HRD in Sri Lanka with the launch of the innovative Bachelor of Information Technology (BIT) External Degree programme. Apart from the prestige of a University of Colombo degree to students, the BIT programme also has the indirect but most desirable effect of standardizing ICT education of an era where commercialism is threatening the quality of education.

- His quest for capacity building in ICT human resources can be seen more clearly by his single-handed contribution in this area at the University of Colombo – making it the showcase among the entire university system in Sri Lanka and beyond. Investing in human resource development in ICT is also a huge risk – that of aiding in the brain drain. This is where Prof. Samaranayake's broadness of vision and almost unreasonable trust, especially in the case of training Faculty of the University, is most clearly seen. Commencing with the meagre funding resources extended by donors in 1970s an era when the developed countries themselves were just getting into the area of serious ICT human resource development, Prof. Samaranayake commenced his quest of directing all local and foreign funding to develop ICT Human Resource development at the University of Colombo.

- In recognition of his towering contribution in the field of ICT in the country, he has been bestowed with several national awards in the form of the Lions' Club Gold Medal for the Most Outstanding Citizen of Sri Lanka in 1986, the Vishva Prasadini Award in 1996 on the occasion of the 80th birthday of the then Prime Minister Sirimavo Bandaranaike and the Vidya Jyothi Presidential Award in 1998.

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01

Introduction



College House

UNIVERSITY OF COLOMBO

The University of Ceylon was established by the state council in April 1942. By 1950, the University of Ceylon had gained a reputation as an important centre of excellence in the Commonwealth. The Higher Education Act of 1966 established a National Council of Higher Education (NCHE) and later in 1972, under the University of Sri Lanka Act No. 1 of 1972, all universities were brought under one umbrella and made campuses of a single university and established as the University of Sri Lanka.

The University of Ceylon, Colombo was named the Colombo Campus of the University of Sri Lanka. This system prevailed until 1977. The University autonomy was weakened and as a result, a new Act was introduced in 1978. Under the Universities Act No. 16 of 1978, all campuses of then single university became independent universities. Accordingly, the University of Colombo, Sri Lanka regained its autonomy in 1978. The University of Colombo now consists of ten faculties, one school (University of Colombo School of Computing), six institutes and several centers in addition to the Sri Palee Campus.

The University of Colombo is a public state university located primarily in Colombo, Sri Lanka. The University of Colombo is the oldest institute of modern higher education in Sri Lanka, specializing in the fields of natural, social, and applied sciences as well as mathematics, computer sciences, medicine, education, and law. It has been ranked among the top 10 universities in South Asia.



The University of Colombo with a proud history of over 115 years continues in its endeavor to meet the challenge of maintaining its position as the "Metropolitan University, Modern and International in Outlook and Character". The location of the University affords the student population all the advantages of a "metropolitan university", with easy access to international information/ resource centres, libraries, theatres, sports complexes etc.

Its central location within the City of Colombo provides easy access to a wide range of cultural, entertainment and business facilities. The University of Colombo has a multi-cultural multi-ethnic student and staff population, fostering social harmony, cultural diversity, equal opportunity and unity.

The University of Colombo has ten Faculties, a Campus, a School and six Institutes. The following faculties cater to undergraduates as well as postgraduates of the respective disciplines.

- Faculty of Arts
- Faculty of Education
- Faculty of Law
- Faculty of Management and Finance
- Faculty of Medicine
- Faculty of Science
- Faculty of Nursing
- Faculty of Technology
- Faculty of Graduate Studies
- Faculty of Indigenous Medicine



Faculty of Science

DIRECTORS



Dr. D A S Atukorale

2022-Present



Professor K P Hewagamage

2016 - 2022



Late Professor
G N Wikramanayake

2010 - 2016



Dr. A R Weerasinghe

2004 - 2010



Late Vidya Jyothi Professor
V K Samaranayake

2002 - 2004


05
UNDERGRADUATE DEGREES
≈1100+
STUDENTS
01
EXTERNAL DEGREE
≈ 5000
STUDENTS
06
MASTERS DEGREES
≈ 500
STUDENTS
02
RESEARCH DEGREES
≈ 20
STUDENTS

OUR DEGREE PROGRAMMES

Internal Undergraduate Degree Programmes

Bachelor of Science in Computer Science (BSc. in CS)

Bachelor of Science Honours in Computer Science (BSc. (Hons) in CS)

Bachelor of Science Honours in Software Engineering (BSc. (Hons) in SE)

Bachelor of Science in Information Systems (BSc. in IS)

Bachelor of Science Honours in Information Systems (BSc. (Hons) in IS)

External Undergraduate Degree Programme

Bachelor of Information Technology (BIT)

Postgraduate Degree Programmes

Master of Computer Science (MCS)

Master of Science in Computer Science (MSc. in CS)

Master of Information Technology (MIT)

Master of Information Security (MIS)

Master of Business Analytics (MBAnalytics)

Master of Cybersecurity (MCyberSec)

Postgraduate Research Degrees

Doctor of Philosophy in Computing (PhD)

Master of Philosophy in Computing (MPhil)

Master of Computing (MCom)

MILESTONES OF POSTGRADUATE TAUGHT COURSES AT UCSC/ DCS/ DSCS/ ICT

2018	Master of Business Analytics Master of Cybersecurity
2017	Master of Information Technology, Master of Information Security, Master of Computer Science, Master of Science in Computer Science
2009	Master of Science in Information Security
2002	Master of science in Information Technology, Master of science in Computer Science, Master of science in Advanced Computing
1990	Inaugral MSc in Computer Science with the assistance of Cardiff University (UK) with funding from UNDP
1988	Postgraduate Diploma in Information Technology with the assistance of Japan International Cooperation Agency - JICA
1986	Postgraduate Diploma in Computer Applications

MILESTONES OF COMPUTING AT UNIVERSITY OF COLOMBO



1970

The Statistical Unit was formally approved by the Senate of the University of Ceylon, Colombo, at its 20th meeting held on 26-06-1970 as a unit for the entire university to undertake statistical and data processing



1972

The Department of Mathematics and the Statistical Unit of the University of Colombo made a ground-breaking attempt to initiate new course units in Mathematics, Statistics and Fortran Programming leading to Statistical Services job stream for the students with the new Special Degree in Development Studies in the Faculty of Arts.



1977

Under the Colombo-Reading Collaboration, the Department has gifted an HP 9825 Mini Computer with a Card Reader



1980

A Data General Eclipse NOVA/4 minicomputer was obtained by a loan in 1980 for one year and housed in the Department of Mathematics



1981

The first minicomputer Data General Eclipse Model S/140 was purchased with time-sharing OS and 16 VDU for Fortran and Cobol Programming



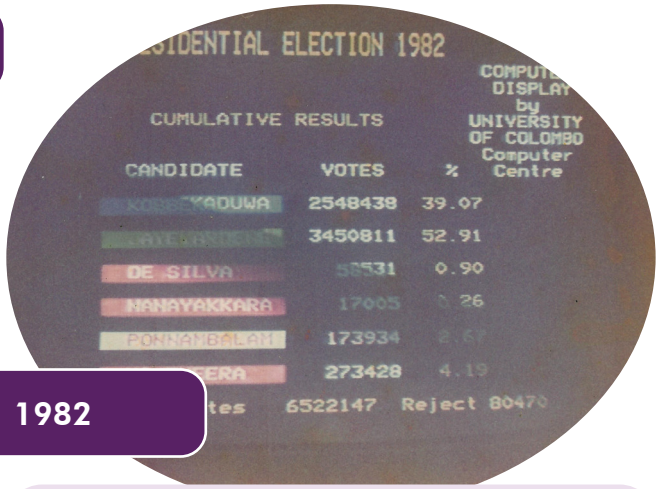
1981

Establishment of Computer Centre



1981

The Department of Mathematics granted its first local PhD in Computing and Statistics for the first time in the history of the University Education in Sri Lanka



1982

BBC computers were used to process and release, to Rupawahini, the national TV the results of the 1982 presidential elections (first ever computerization of a national event); proliferation of BBC microcomputers over Econet, the first LAN for file sharing, printing and Basic programming in a 30 machine PC lab; Introduction of first-generation personal computers- KayPro CP/M.


DAILY NEWS

tension course

computer programming

The University of Colombo has started an extension course in computer programming according to a spokesman for the University. has been organised Department of tics of the

A large number of potential students of computer science have benefited by this extension course which cheap c charges institutic

An advan

1982

Three Certificate courses in Computer Applications, specially designed for users in Scientific, Technological and Financial & Management were introduced. Three courses are Certificate Course in Computer Applications in Science and Technology using FORTRAN, Certificate Course in Computer Applications in Financial & Management using BUSINESS BASIC and Certificate Course in Computer Applications in Finance & Management using COBOL.



1983

Establishment of Micro Computer Laboratory for the Computer Center



1984

Introduce the International Course on Statistics and Agriculture



1985

Establishment of the Department of Statistics and Computer Science (DSCS)



1986

Local Language Development



1987

Establishment of the Institute of Computer Technology (ICT) (Funded by JICA)



1988

UNICODE Initiative



1992

Commencement of Third Country Training Programs (TCTP) (Supported by JICA)



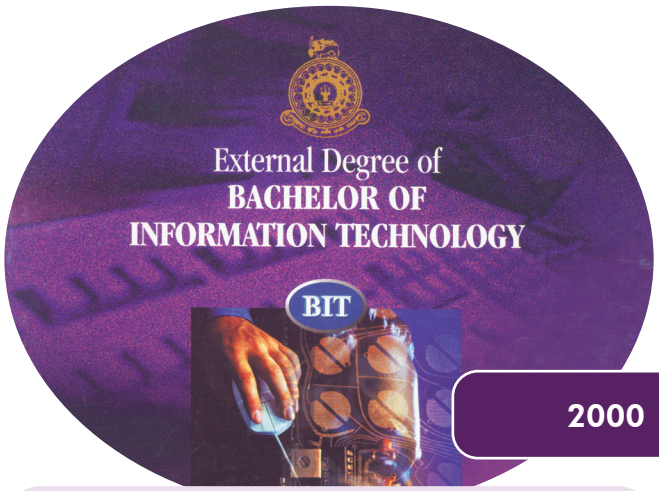
1996

National Website for Sri Lanka



1999

Institute of Computer Technology Presented with JICA President's Award



2000

Introduction of the Bachelor of information Technology (BIT) External Degree Programme



2002

Establishment of the UCSC by the merge of the ICT & DCS University of Colombo School of Computing

KEY STRENGTHS

Highly Qualified Academic Staff



Competency of the academic staff is one of the crucial factors in UCSC's focus on high-quality academic excellence. The UCSC presently has 01 Senior professor, 30 PhD qualified academics graduated from leading universities in UK, Canada, Australia, Japan, Sweden etc., 08 MPhil and Masters qualified staff to serve in the academic activities. Another key strength of the staff is their expertise in diverse domains in Computing. The academic staff publish their research findings in reputed Journals and Conferences each year. The human resource which has been built up over a long period of time with foresight as a long-term investment is now bearing rich dividends.

Strong Research Potential



With the strong research training investment over the past decades, the UCSC now possesses arguably the strongest research potential in computing in Sri Lanka; one which matches that which is available in the best of international universities. UCSC is reputed for its international collaboration with research teams in Europe and Asia through the funding agencies such as Japan International Corporation Agency (JICA), Swedish International Development Agency (SIDA), International Development Research Centre (IDRC). Several recent research outcomes at UCSC have received local and international awards.

Healthy Industry-University Relationship



The Professional Development Centre (PDC) of the UCSC develops and promotes strategic relationships with key organizations in the Information Technology industry. PDC places over 300 students each year on an internship as a part of their undergraduate degrees in the software industry for a period of six months. The Computing Services Centre (CSC) of the UCSC undertakes consultancy work for state and private sector organizations. The CSC also conducts short term training courses in diverse areas of emerging technologies.

Funding and Facilities



One of the cornerstones of the success of the UCSC and its predecessors has been the international level facilities available to faculty and students. It has been one of the key factors through which staff retention has been possible. This resource has been strengthened over the years through the support of international donor agencies which has been readily forthcoming owing to our past track record. In addition to this, the UCSC's earning through consultancy and research has made it self-sufficient with respect to operational expenses and the acquisition of state-of-the-art infrastructure.

OUR ORGANIZATION

The primary activity of the University of Colombo School of Computing is to deliver quality undergraduate and postgraduate degree programmes in computing. The UCSC has three academic departments, eight administration and finance divisions and six centres. The academic staff is allocated to the three academic departments based on their specialization and teaching expertise. The main administration and operational units of UCSC are shown in Figure 1.

Academic departments

Academic Departments	Department of Computation and Intelligent Systems (CIS)
	Department of Communication and Media Technologies (CMT)
	Department of Information Systems Engineering (ISE)

Centres

Centres	Advanced Digital Media Technology Centre (ADMTC)
	Centre for Digital Forensics (CDF)
	Computing Service Centre (CSC)
	External Degrees Centre (EDC)
	e-Learning Centre (eLC)
	Professional Development Centre (PDC)

Board of studies

BoS: Board of Studies, which consists of IUD, RHD and EEP	Internal Undergraduate Degrees (IUD)
	Research and Higher Degrees (RHD)
	External and Extension Programmes (EEP)

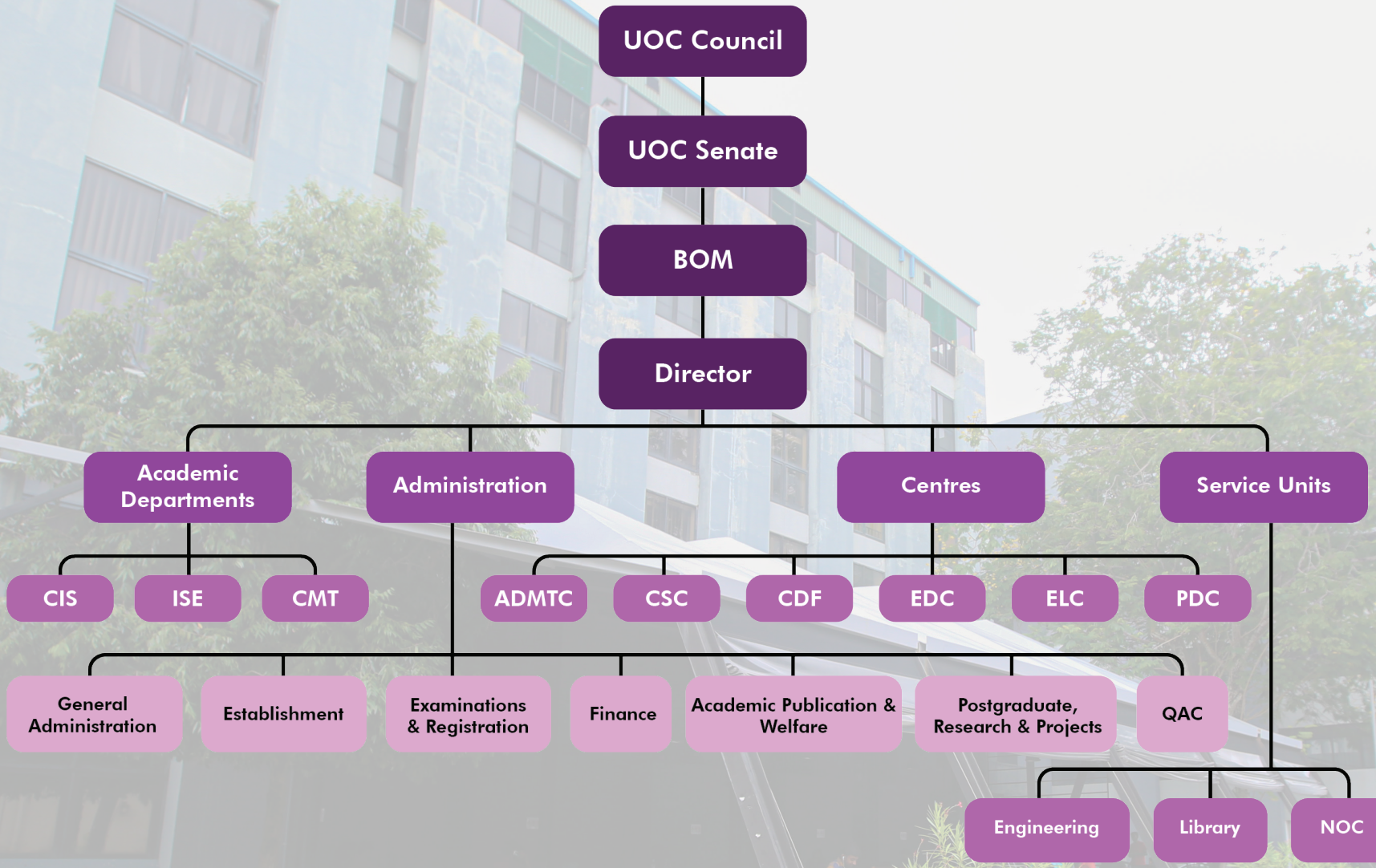


Figure 1: Administration and Operational Units

STUDENT SERVICES

Library



The main role of the UCSC library is to facilitate a variety of quality and reliable resources that support learning, teaching, and research purposes for both the students and the staff of the UCSC. The Library possesses a rich collection of books, magazines, conference proceedings, theses, and dissertations covering a vast area of disciplines related to Computer Science. Users of the library can fulfill their need for timely access to information relevant to the resources through the online public access catalog of the UCSC library (http://pusthaka.ucsc.cmb.ac.lk/). And also UCSC digital library provides free access to undergraduate and postgraduate dissertations not only for all the students and the staff of the UCSC but also the whole community (http://dl.ucsc.cmb.ac.lk/jspui/).

For further information visit, https://ucsc.cmb.ac.lk/library/

Computing Laboratories



UCSC has eight laboratories with over 250 computers. The username and password to access systems are provided by the Network Operating Centre. Wifi access facilities are provided for the registered students on request.

Network Services



With the view of centralizing the operations of the computer network of the University of Colombo, the Network Operating Centre (NOC) was established in 2002. NOC is located at UCSC and it is the central position, which provides the network connections to all the other faculties and centres in the university. The Internet facility to the university through the LEARN network is also channelled via the NOC. The centre is well equipped with modern networking equipment including servers, switches, routers and test equipment received under the financial assistance of SIDA and ADB. The entire backbone cable system of the campus-wide network is centered at the NOC providing the connectivity to over 2000 users.

Wi-Fi Connectivity



The students are required to submit a completed Wi-Fi connection request form to the NOC during office hours. The request forms can be downloaded from UCSC web site (ucsc.lk/noc). One device per student is registered and the service will be bound to the physical address of the device. The service will be activated by one week of the submission of the request.

The UCSC monitors all user activities according to UGC's policy and guidelines. Students are strongly advised not to engage in unethical or illegal activities using internet connection and computing resources. There is a limited bandwidth allocation for each user.

For further information visit http://ucsc.cmb.ac.lk/noc/

Online Learning Material

Students are provided with a login to the postgraduate virtual learning environment (PGVLE) at the commencement of the programme. Student is required to refer the PGVLE for learning materials, submission of assignments and masters programme related notices etc.

For further information visit http://pgvle.ucsc.cmb.ac.lk/



Canteen Facilities

The UCSC Canteen which is located inside the UCSC building complex is open for the students during the academic semesters from 7.00 a.m. to 6.00 p.m. Canteens of the other faculties are also available for the use of UCSC students.



Photocopy Facility

Photocopy facility is available at the photocopy unit located at the ground floor of the canteen area (East Wing entrance of the UCSC building).



OTHER SERVICES

Audio Visual Recording

An advanced digital studio is equipped with state-of-the- art digital equipment such as digital video cameras, video switcher, editing control unit, audio mixer, lighting system and non-linear editing system. It is one of the best studios in Sri Lanka and is playing a central role in providing distance-learning material.



Video Conferencing Facilities

UCSC possess the state-of-the-art video conferencing equipment.



Auditorium

A new state-of-the-art multipurpose auditorium is available with over 400 seating capacity.



02

Research Groups

UCSC RESEARCH LABORATORY

UCSC plans to inaugural open for its State-of-the-art research facility UCSC Research Laboratory in 2021. The Laboratory is a dedicated interactive research space consisting of over 1000 square feet. The initiative aims to strengthen the existing research and development environment of UCSC by providing a conducive research and development. Space will provide students and faculty access to the new instructional research spaces, study areas, mini- library, seminar room, conference room, printing room, common areas and rest areas for students, faculty and community interaction.



RESEARCH GROUPS @ UCSC

Research and innovations lie at the heart of success in a University. As the pioneer in Computer Science education in the country, UCSC has already identified the potential we have to help solve the real-world problems through technology partnerships and collaborations. Our culture of collaboration encourages innovative discoveries in areas vital to the betterment of the world.

Eleven independent research groups are working on diverse areas witnessing the importance of interdisciplinary research because we have identified it is at the intersection of disciplines where new ideas emerge, and innovative research happens. Our labs are enriched with academicians and students from undergraduate, masters' and doctoral studies.

All members of the UCSC community are encouraged to create new knowledge through inventive insights and solutions.

SYSRES - SYSTEM RESEARCH GROUP

Dr. D A S Atukorale

System Research Group (SysRes) is a research group at UCSC dedicated to exploring the fascinating realms of operating systems, and, computer networks. Our primary focus is on advancing the understanding and development of efficient and reliable systems that power modern computing infrastructures. Within our group, we delve into cutting-edge topics, seeking to improve system performance, security, and scalability. Our members actively engage in both theoretical and practical investigations, utilizing state-of-the-art methodologies and tools to push the boundaries of knowledge in these areas. Collaborating with industry partners and academia, we seek to apply our findings to real-world scenarios, ultimately enhancing the overall computing experience for users worldwide.

LANGUAGE TECHNOLOGY RESEARCH LABORATORY (LTRL)

Dr. B H R Pushpananda

Language Technology Research Laboratory (LTRL) was established in 2004 to address the growing need of local language computing in Sri Lanka by conducting Localization and Language Processing research and development. The LTRL conducts research in the field of computational linguistics: phonetics/phonology, morphology,and syntax of local languages, Text Understanding & Generation: Machine Translation, Text Summarization, Question Answering, Speech & Multimodal Processing: Automatic Speech Recognition and Text to Speech. These research studies primarily focus on local languages, namely Sinhala and Tamil. The research group has a diverse range of activities: Research & Development, Consultancy, Training and Services. Most of the research-based applications developed by LTRL are available for access on the website: www.subasa.lk.

SYNERGY RESEARCH GROUP

Mr. R J Amaraweera

Research Team : Mr. Rangana Jayashanka (Principal Investigator), Dr. Kasun Karunanayaka, Mr. Upul Anuradha

The Synergy Research Group is dedicated to applying the body of knowledge in computer science to solve problems across various domains, including Medicine, Education, Agriculture, and Environmental Sciences. Our focus lies in key areas such as Machine Learning, Data Analytics, Data Visualization, Human-Computer Interaction, Technology for Development, and Learning Analytics.

MODELLING & SIMULATION GROUP

Dr. K D Sandaruwan

The Modeling and Simulation Research Group, established in 2009, specializes in computer-based mathematical, graphical, and algorithmic representations of real-world systems. The group excels in Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR), with deployed applications in the Sri Lanka Navy, Army, Air Force, Port Authority, Ministry of Fisheries, and Ocean University. Key projects include Vidusayoura (ship-handling simulator), Siyara VTMS (3D vessel traffic monitoring), and the Field Artillery Simulation System (military training).

The group has received many awards such as e-Swabhimani, APICTA, and NBQSA, published over 100 research papers, and secured national and international grants. It continues to drive cutting-edge technological solutions for national development. Expanding its expertise, the group is now venturing into sports biomechanics, analysis, and visualization to enhance performance and injury prevention.

INTERDISCIPLINARY MOLECULAR COMMUNICATION AND SENSING RESEARCH GROUP (IMCS)

Dr. Asanka P Sayakkara

The Interdisciplinary Molecular Communication and Sensing Research Group is exploring the communication and sensing technologies at the molecular level. Our work spans over the fields of biology, chemistry, computer science, and engineering, with a focus on understanding how molecules can be employed for communication and sensing applications. Through interdisciplinary collaboration, we strive to pioneer breakthroughs that have the potential to impact diverse fields, from healthcare to environmental monitoring.

AI IN EDUCATION RESEARCH GROUP

Prof. K P Hewagamage

The AI in Education Research group in UCSC conducts research on enhancing the quality of education by applying latest developments of AI. Our research mainly focuses on harnessing the power of Generative AI and Large Language Models to develop interactive, high quality educational chatbots. Students often struggle with new subjects, requiring personalized support to prevent disengagement. However, traditional teaching assistant ratios in large courses limit their ability to provide timely assistance. Despite global trends towards digital solutions, Sri Lankan Higher Education Institutes have not fully utilized Conversational AI for round-the-clock student services. To address this issue, we have developed a Teaching Assistant Bot (TA BOT) for a Software Engineering course which is available on https://chat.ucsc.cmb.ac.lk/ for experimentation.

EDUSMART RESEARCH GROUP

Dr. (Ms.) T A Weerasinghe

The research group EduSmart was formed to provide better support to lifelong learners through a smart learning environment, enabling learning and assessment to be more exciting and engaging.

The group aims to expand services that can support learning and development through online learning platforms, which can track its learners' progress and provide personalized support. To achieve this aim, the group will investigate research fields such as learning analytics, educational data mining, and interaction design.

CloudNET (ECloud ML)

Dr. (Ms.) Dinuni Fernando

CloudNet Research Lab is dedicated to the realms of cloud computing and virtualization, with a specific emphasis on enhancing the performance of secure live migration of virtual machines. We explore innovative methods to elevate the efficiency and security of live virtual machine migration and fault tolerance. As a subgroup, further our ECloudML Education based machine learning research group was established in 2021 with diverse and multi disciplinary research work spread across education, machine learning and cloud domain. ECloudML collaborates with natural science research groups around the globe to conduct multi disciplinary machine learning based projects.

THE COGNITIVE SYSTEMS AND TIME SERIES (CoTS) RESEARCH GROUP

Dr. M I E Wickramasinghe

The Cognitive Systems and Time Series (CoTS) research group explores the relationship between human cognition and analyzing time-dependent data. Cognitive systems refer to developing computational models and algorithms that mimic human cognitive processes such as perception, learning, reasoning, and decision-making. Moreover, time-series research analyses data collected over time to uncover patterns, trends, and dependencies. We integrate cognitive models with time series methods to analyze and interpret complex temporal data to make sense of complex time series data, leading to improved decision-making, forecasting, and understanding of dynamic processes in various domains.

MINDSYS - MIND SYSTEMS RESEARCH GROUP

Dr. H E M H B Ekanayake

Established in November 2023, the MindSys Research Group at the University of Colombo School of Computing is an interdisciplinary team dedicated to exploring mind systems at the intersection of philosophy, science, and technology. They emphasize a unique blend of insight and innovation, pushing the boundaries of cognitive science using computing technologies. Notably, the group integrates Eastern philosophical insights, particularly from Buddhism, into the Western philosophical framework, creating a holistic approach. Their research spans philosophical inquiries into consciousness, rigorous scientific investigations of human cognition, and the use of cutting-edge computational modeling, simulations, machine learning, and artificial intelligence. MindSys is committed to unraveling fundamental aspects of human cognition, including learning, perception, decision-making, behavior, and intelligence.



UCSC SPATIAL EXPERIENCE AND HUMAN-COMPUTER INTERACTION (USE-HCI) RESEARCH GROUP

Mr. R M U A Rathnayake

The USE-HCI research lab is an interdisciplinary research lab working to invent the future of technology. The vision of the lab is to design, build and enhance innovative technologies to solve real-world problems. To this end, the USE-HCI Lab aims to develop technology solutions to address community-driven problems by bringing together an interdisciplinary set of people to share ideas and collaborate on research related to the interaction between design, people, and technology.

TRANSFORMERS RESEARCH GROUP

Dr. (Ms.) S M K D Arunatileka

The eTransformation Research Group typically focuses on studying the impact, implications, and evolution of digital technologies on various aspects of society and industries for social good and benefit. This group explores how digital transformations influence different domains, seeking to understand the challenges, opportunities, and changes brought about by the adoption of digital technologies.

GEOMATICS - GIS RESEARCH GROUP

Dr. (Ms.) Enosha Hettiarachchi

GeoMatics is a GIS research group at the UCSC dedicated to pushing the boundaries of geospatial technologies by addressing current limitations and developing innovative solutions across various domains. Our objectives encompass the development and implementation of cutting-edge methodologies for spatial analysis in areas like urban planning, environmental science, public health, disaster management, and natural resource management. We advocate for the widespread use of GIS in decision-making processes, emphasizing the importance of open-source software and data accessibility for research and development. Collaborative interdisciplinary efforts are encouraged, fostering partnerships between professionals and students from diverse fields such as Geography, Computer Science, Environmental Science, Public Health, and Engineering. Through knowledge sharing, capacity building, and a supportive research environment.



AGROTECH RESEARCH GROUP

Prof. K P Hewagamage

The AgroTech research group was established in 2023 to address the identification of Nitrogen(N) requirement which is one of the crucial problems engaged in the agriculture sector and help farmers to make actionable decisions. The objective of our research is to generate ICT based cost effective solutions in determining the Nitrogen based fertilizer requirement in paddy cultivation. To this end, the group explores the new techniques to manage agricultural data and knowledge and investigates the applicability of emerging technologies such as artificial intelligence, human computer interaction, data analytics and drones in Agri-tech to make actionable decisions.

MLDAG RSEARCH GROUP

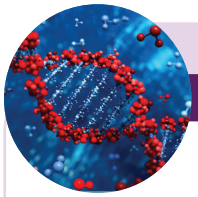
Mr. G P Seneviratne

'ML and Data Analytics for Good is a forward-thinking research group that combines the power of machine learning, data analytics, and a deep understanding of agro and transportation systems to drive positive change in society. We are dedicated to harnessing the potential of data-driven insights to address complex challenges and improve the lives of individuals and communities worldwide. Our multidisciplinary approach focuses on leveraging advanced ML techniques and analytics to optimize agricultural practices, enhance crop yield, promote sustainable farming methods, and mitigate the impact of climate change on food production.

MIXED REALITY LAB

Dr. K A K T Karunanayake

The Mixed Reality Lab (MXR) aims to push the boundaries of research into interactive new media technologies through the combination of science, engineering, art, and creativity. The aim of the lab is to invent the future through the visualization and realization of new media research. This continues the tradition established at Xerox PARC, Disney Imagineering, and the MIT Media Lab and by visionary individuals such as Douglas Englebart, Alan Kay, Brendan Laurel and Jaron Lanier. The key objectives of the Mixed Reality Lab are as follows: create a center of excellence for interactive media and entertainment technology, provide a multi-disciplinary research environment for students, propose new technologies to promote sustainable development, and develop new assistive technologies for children and the elderly.



BIOSYS RESEARCH GROUP

Dr. (Ms.) M W A C R Wijesinghe

The Bioinformatics and Systems Biology (BioSys) research group in the UCSC conducts interdisciplinary research at the interface of Computer and Biological Sciences. Members of the group are from various sub domains including machine learning, bioinformatics, life science, high performance computing and statistics. Our research primarily involves conducting quantitative studies such as pattern recognition and network analysis to discover biological knowledge; and developing computational techniques, algorithms, tools and statistical models to analyze various biological data and to make predictions on them.

ELEPIDYNAMICS RESEARCH GROUP

Dr. P V K G Gunawardana

'ElephIDynamics,' dedicated to the cause of wildlife conservation and the mitigation of human-elephant conflict in Sri Lanka. The primary focus of the group is on leveraging Machine Learning techniques for elephant identification using photographic images to accurately identify elephants, which is pivotal in comprehending their movements and population dynamics.

C4SA - SUSTAINABLE AGRICULTURE RESEARCH GROUP

Dr. (Ms.) L N C De Silva

The "Computing for Sustainable Agriculture (C4SA)" research group focuses on using advanced computing technologies to promote sustainability in agriculture practices. By analyzing vast amounts of agricultural data through data analytics, machine learning, and artificial intelligence techniques, the group provides farmers and agricultural stakeholders with actionable information and decision support tools to improve productivity and sustainability across the agricultural value chain. Through close collaboration with industry partners, government agencies, and academic institutions, the group aims to translate research findings into practical solutions that address real-world challenges faced by farmers and agricultural communities, driving innovation and fostering sustainable practices that ensure food security, environmental stewardship, and economic prosperity for present and future generations.

DavLaB: PIONEERING DATA-DRIVEN INSIGHTS ACROSS DISCIPLINES

Dr. S S P Mathara Arachchi

DavLab is an innovative research group dedicated to advancing the frontiers of data science through experimental research in data mining, data analytics, machine learning, and digital signal processing. Our multidisciplinary approach leverages cross-sectional quantitative data to uncover insights across diverse domains, including health informatics, plant diversity, and human behavior.

At DavLab, we focus on developing and applying cutting-edge analytical techniques to address complex real-world challenges. By integrating sophisticated algorithms with robust data-driven methodologies, our team strives to contribute meaningful solutions that enhance decision-making, foster innovation, and promote sustainable practices. Our work not only bridges the gap between theory and application but also aims to drive impactful outcomes across scientific, technological, and societal landscapes.

UCSC UAV RESEARCH GROUP

Prof. G D S P Wimalaratne

UCSC UAV Research Group is dedicated to advancing multiple aspects of small UAVtechnologies. Together with industry collaborators, UCSC academic staff and students work on challenging, multidisciplinary projects on the cutting edge of unmanned system development. Technical areas of focus include UAV design, development of multiple switchable payloads for general-purpose drones, concepting theories and systems, fabrication and integration, analysis and simulations, improving UAV communication architectures, UAV pilot training and certification. We are committed to developing enthusiasm about UAV systems and seek to make a difference in the national/ international landscape. The work is underway in developing a hybrid VTOL UAV using custom and open-source hardware with AI-based autonomy for disaster response and agriculture monitoring.

UCSC SECURITY AND FORENSICS RESEARCH GROUP

Prof. T N K De Zoysa

The UCSC Security and Forensics Research Group is a pioneering initiative that unites the academic expertise of UCSC's faculty with the practical experience of the Centre for Digital Forensics (CDF) to advance the fields of cybersecurity and digital forensics. Formally organizing longstanding contributions from both entities, the group focuses on a broad range of research areas including digital evidence analysis, network security, real-world case studies, and incident response strategies. By fostering close collaboration between academia and practitioners, the group bridges the gap between theory and application, delivering impactful solutions to contemporary digital security challenges. Through highimpact publications, real-world investigations, and community engagement via workshops and seminars, the group is committed to shaping a safer digital landscape and driving meaningful progress in the cybersecurity and forensics research community.

BROKEN RESEARCH GROUP

Dr. H N D Thilini

BROKEN (Broad Research Oriented in Knowledge Exploration on Negligence) is a research group dedicated to the exploration and deconstruction of systems, protocols, and concepts across the computing stack. Our primary goal is to identify breakpoints, flaws, vulnerabilities, and oversights in the design, implementation, and usage of modern data models, algorithms, information systems, and software systems.

SOFTWARE INSIGHTS RESEARCH GROUP

Dr. Roshan Rajapakse

Software Insights Lab is an interdisciplinary research group focused on the research and engineering of software technologies, continuous software development practices (e.g., CI/CD), and emerging delivery models (e.g., Software as a Service). We use empirical methods and interdisciplinary concepts from other disciplines, such as cognitive science, to improve the reliability, efficiency, and security of modern software systems.

03

Postgraduate Education

3.1

Master of Computer Science/ Master of Science in Computer Science

MASTER OF COMPUTER SCIENCE/MASTER OF SCIENCE IN COMPUTER SCIENCE

The first ever Computer Science Masters programme in Sri Lanka was launched by the University of Colombo in 1990, while Computing was taught at Undergraduate level by the University of Colombo since 1967. The Masters level teaching grew ever since to the current state, and has evolved into multiple masters programs today. The Master of Computer Science (MCS) programme is aimed at expanding the theoretical foundation and technical skills of professionals who are in the software industry and academia. The programme consists of both the course work and a dissertation spanning into 2 years. The students who excel in the first two semesters of the MCS programme are provided an opportunity to upgrade themselves to the Master of Science in Computer Science (MSc in CS) which includes an advanced research-focused dissertation work.

DURATION

MCS/MSc in CS: Two academic years, part-time, consists of four semesters (up to 15 weeks per semester).

LECTURES

Lectures and practicals will be conducted according to the time table.

ENTRY QUALIFICATIONS

(a) A Bachelor's Degree in Computing from a University or Institution recognized bythe University Grants Commission and/or the University of Colombo; OR

(b) A Bachelor's Degree in Science with Computing as a major subject from a University or Institution recognized by the University Grants Commission and/or the University of Colombo; OR

(c) A Bachelor's Degree in Electronics Engineering or Telecommunications Engineering from a University or Institution recognized by the University Grants Commission and/or the University of Colombo; OR

(c) Any other academic or professional qualification deemed equivalent to a Bachelor's Degree in Computing by the Senate of the University of Colombo on the recommendation of the relevant board of studies of the School. Each application under this category shall be considered on a case-by-case basis; AND

(d) Attaining the minimum performance score in a selection test, such as General Computing Competency Test (GCCT); AND

(e) Fulfilling additional prerequisites such as an interview, availability of vacancies, and payment of the requisite fees.

ADMISSION

The selection process consists of a written test followed by an interview.

CREDIT REQUIREMENTS

Course/Subject Description	Credit Value	Direct Staff-Student Contact Hours	Notional Hours (direct staff-student contact hours and independent learning)
Lecture course	1	15	50
Laboratory course	1	30	50
Individual project	5	variable	500
Individual Research	15	variable	1500

One credit is considered equivalent to 50 notional learning hours for a taught course and laboratory course. In the case of project work/ Independent Studies, one credit is considered equivalent to a minimum of 100 notional hours.

PROGRAMME STRUCTURE

The programme has a number of courses and each course will carry a specified number of credits. Module descriptors for each course are available on VLE.

First and second semesters consist of compulsory courses while the third and fourth semesters consist of both compulsory and optional courses.

SEMESTER 01

Code	Title	Credits	Compulsory / Optional
MCS1301	Advanced Algorithms	03	C
MCS1302	Research Methods	03	C
MCS1303	Advanced Database Systems	02	C
MCS1304	Advanced Data Communications Networks	03	C
MCS1305	Advanced Software Engineering	02	C

MCS1301 - Advanced Algorithms

This course module explores key techniques for solving complex computational problems. Topics include asymptotic analysis, time complexity, and solving recurrences, along with tractable and intractable problems. Students will study string matching algorithms (Naïve, Boyer-Moore, KMP, Rabin-Karp), dynamic programming, greedy strategies, and graph algorithms such as shortest paths, minimum spanning trees, and vertex cover problems. The course also covers randomized algorithms, including Monte Carlo and Las Vegas approaches. Through theoretical analysis and hands-on implementation, students will develop a deep understanding of algorithmic efficiency and optimization.

MCS1302 - Research Methods

This course module provides a comprehensive foundation in conducting rigorous academic research. It covers the scientific method, research philosophies (e.g., positivism, interpretivism, pragmatism), and approaches to theory development (induction, deduction, abduction). Students will learn to define research problems, formulate research aims and questions, and conduct systematic literature reviews using proper referencing styles. The course explores research strategies such as experiments, case studies, surveys, and ethnography, along with method choices, time horizons, and ensuring credibility. Ethical considerations, research integrity, and the process of publishing are also emphasized, equipping students with essential skills for high-quality academic and professional research.

MCS1303 - Advanced Database Systems

This course module explores core principles and emerging trends in modern database management. Topics include database integrity, transaction management, recovery, concurrency control, and distributed databases. Students will examine query processing techniques, optimistic concurrency control, and advanced data models such as object-relational databases. The course also covers emerging technologies, including data warehousing, XML and internet databases, and evolving trends in database systems. Through theoretical analysis and hands-on implementation, students will develop expertise in designing, optimizing, and managing complex database environments for diverse applications.

MCS1304 - Advanced Data Communications Networks

This course module provides an in-depth exploration of modern networking principles, protocols, and emerging technologies. It covers channel characterization, the TCP/IP stack, IP addressing, and support protocols. Students will examine multi-access protocols (CSMA, FDMA, TDMA), routing strategies (IPv6, OSPF, BGP, MPLS, multicast, DHT), and end-to-end issues such as TCP congestion control and QoS. The course also delves into data center design, virtualization, SDN concepts, and advanced networking paradigms, including CDMA, MANETs, IoT, and vehicular networks. Practical experience with network simulation tools (NS, Mininet) and discussions on emerging trends prepare students for cutting-edge network research and development.

MCS1305 - Advanced Software Engineering

This course module explores modern software development challenges, methodologies, and best practices. It covers the evolution of software development models, requirement engineering, and industry-standard unified process models. Students will study object-oriented modeling, software architecture, refactoring, and design patterns, along with software reuse and component-based engineering. The course also delves into code quality, empirical and open-source software engineering, and the impact of social and agile practices. Advanced tools such as code analyzers, clone detectors, and static/dynamic analysis techniques are explored. Emerging trends prepare students for cutting-edge research and innovation in software engineering.

SEMESTER 02

Code	Title	Credits	Compulsory / Optional
MCS2301	Principles of Programming Languages	02	C
MCS2302	Information Systems Security	02	C
MCS2303	Machine Learning	03	C
MCS2304	Advanced Operating Systems	03	C
MCS2305	High Performance Computing	02	C

MCS2301 - Principles of Programming Languages

This course module provides a comprehensive study of programming language design, implementation, and evaluation. It covers language implementation methods, syntax and semantics, lexical and syntax analysis, and key concepts such as data types, bindings, type checking, and scope. Students will explore expressions, control statements, subprograms, and object-oriented language features, along with exception handling and event-driven programming. The course introduces lambda calculus and functional programming fundamentals while examining emerging trends in language design. Through theoretical analysis and practical exploration, students will gain a deep understanding of language paradigms and their impact on software development.

MCS2302 - Information Systems Security

This course module provides a comprehensive understanding of security principles, cryptographic techniques, and system protection mechanisms. It covers hash algorithms, symmetric and asymmetric encryption systems, key management protocols, and Java cryptography. Students will explore network, web, and email security, along with secure operating systems, databases, and software applications. The course also examines legal aspects of cybersecurity and emerging trends in information security. Through theoretical foundations and practical implementations, students will develop the skills to analyze, design, and implement secure information systems.

MCS2303 - Machine Learning

This course module provides a comprehensive introduction to fundamental concepts, algorithms, and applications of machine learning. It covers supervised and unsupervised learning, model evaluation, feature selection, and optimization techniques. Students will explore key algorithms such as decision trees, support vector machines, neural networks, and clustering methods, along with deep learning fundamentals. The course also addresses practical challenges, including overfitting, bias-variance tradeoff, and scalability. Through hands-on implementation and real-world case studies, students will develop the skills to design, train, and evaluate machine learning models for various applications. Emerging trends in AI and ML research are also discussed.

MCS2304 - Advanced Operating Systems

The Advanced Operating Systems module explores the design, implementation, and optimization of modern operating systems. Topics include process synchronization, concurrency control, memory management, file systems, and advanced scheduling techniques. Students will study distributed and real-time operating systems, virtualization, security mechanisms, and fault tolerance. The course also covers system performance analysis, resource allocation strategies, and emerging trends in OS research. Through theoretical concepts and hands-on projects, students will develop a deep understanding of complex OS architectures and their role in high-performance computing environments.

MCS2305 - High Performance Computing

This course module focuses on the principles and techniques used to achieve high computational performance in complex applications. Topics include parallel programming, multi-core and distributed computing, cluster and grid computing, GPU programming, and performance optimization strategies. Students will explore algorithms and data structures tailored for high-performance environments, along with techniques for load balancing, memory hierarchy optimization, and scalable computing. The course also covers emerging trends in exascale computing and computational resource management. Through hands-on exercises and case studies, students will gain practical experience in designing and implementing high-performance computing solutions for scientific and engineering problems.

SEMESTER 03

Code	Title	Credits	Compulsory / Optional
MCS3301	Data Warehousing and Mining	03	O
MCS3302	Computer Graphics and Image Processing	03	O
MCS3303	Theoretical Computing	02	O
MCS3304	Natural Language Processing	02	O
MCS3305	Human Computer Interaction	02	O
MCS3306*	Individual Research Project	07	C*
MCS3307**	Individual Project	02	C**

* **MCS3306** is compulsory and offered only to the Master of Science Degree Programme. It spans two semesters with a total credit value of 15.

** **MCS3307** is compulsory and offered only to the Masters Degree Programme. It spans two semesters with a total credit value of 5.

MCS3301 - Data Warehousing and Mining

This course module provides a deep dive into the concepts, techniques, and tools used to extract valuable insights from large datasets. It covers data warehousing concepts, including data modeling, ETL processes, and the design of data warehouses. Students will explore data mining algorithms for classification, clustering, regression, and association rule mining, along with techniques for pattern recognition and anomaly detection. The course also addresses data preprocessing, dimensionality reduction, and the application of mining techniques to real-world problems. Through practical implementations and case studies, students will develop the skills to design, build, and analyze data warehousing and mining systems for business intelligence and decision-making.

MCS3302 - Computer Graphics and Image Processing

This course module explores the principles and techniques used to create, manipulate, and analyze digital images and graphics. Topics include 2D and 3D graphics rendering, geometric transformations, raster and vector graphics, and animation techniques. Students will study image processing techniques such as filtering, enhancement, compression, and segmentation, as well as computer vision fundamentals. The course also covers algorithms for object recognition, feature extraction, and image-based rendering. Through hands-on projects and case studies, students will gain practical experience in developing and optimizing graphics and image processing applications for various fields such as entertainment, healthcare, and engineering.

MCS3303 - Theoretical Computing

This course module provides a rigorous foundation in the mathematical and conceptual aspects of computation. It covers key topics such as formal languages, recursive definitions, regular sets, regular expressions, and finite state automata (DFA and NFA), along with their equivalence and minimization techniques. Students will explore context-free grammars (CFG), pushdown automata (PDA), and the complexities of ambiguity and normal forms in CFGs. The course also delves into Turing machines, decidability, and the Church-Turing thesis, addressing decision problems, the halting problem, and reducibility. Through these topics, students will gain an in-depth understanding of computational theory, including the decidability of language problems and the foundational limits of computation.

MCS3304 - Natural Language Processing

This course module explores the computational techniques used to process and analyze human language. Topics include text preprocessing, tokenization, part-of-speech tagging, syntactic parsing, and named entity recognition. Students will study advanced NLP methods such as word embeddings, topic modeling, machine translation, and sentiment analysis. The course also covers machine learning approaches for NLP tasks, including supervised and unsupervised learning, as well as deep learning models like recurrent neural networks (RNNs) and transformers. Through practical projects and case studies, students will develop the skills to build and evaluate NLP systems for real-world applications in areas such as search engines, chatbots, and automated translation.

MCS3305 - Human Computer Interaction

This course module focuses on the design, evaluation, and implementation of user-friendly interfaces between humans and computers. Topics include usability principles, user-centered design, and methods for conducting user research and testing. Students will explore interaction techniques, such as graphical user interfaces (GUIs), voice recognition, and gesture-based controls, along with the impact of design on user experience (UX). The course also covers accessibility, cognitive load, and designing for diverse user groups. Through hands-on projects and case studies, students will gain practical experience in creating effective, intuitive, and inclusive interfaces for a wide range of devices and applications.

MCS3306 - Individual Research Project

This course unit aims to enhance the capacity of candidates to advance their knowledge, investigative skills and other skills to explore new knowledge within the field of computer science which in turn form the basis for academic advancement and technological development. A candidate specializes an area within the field of computer science and hence, should demonstrate a critical awareness of current issues and recent developments within the area of specialization. This course requires a high level of theoretical engagement, critical analysis and evaluation with respect to the research work carry out. The major expectations of this course unit are: conduct a comprehensive research work in the field of computer science with a substantial research contribution; construct hypotheses in the area of specialization and test them in a scientific manner; conduct a relevant background study with a critical analysis of related scientific work and evaluate current research in the area of specialization to clearly demonstrate the awareness of the broader context of the problem; formalize arguments logically and, employ these arguments to make sound judgements and to conclude a research solution scientifically; conduct a critical evaluation of the research which clearly demonstrates the technical quality and research merit; by following proper academic writing standards, submit a dissertation and a research paper based on the research outcome which is evaluated and accepted; demonstrate the work at the oral examination.

MCS3307 - Individual Project

The aim of this course unit is to enhance the intellectual capacity of candidates to advance their knowledge and investigative skills, and other abilities relevant to computer science, forming the basis for academic advancement and technological capacity. This includes the development of an innovative software application with a research component. The major expectations of this course unit are: conduct a relevant background study with a critical analysis of similar systems and applications to clearly demonstrate a comprehensive level of knowledge and understandability of the broader context of the problem; critically analyze data, make judgments to evaluate the system to clearly demonstrate the technical quality and innovativeness; demonstrate the findings in a dissertation which will be evaluated and accepted; demonstrate the work at the oral examination.

SEMESTER 04

Code	Title	Credits	Compulsory / Optional
MCS4301	Systems Modelling & Simulation	03	O
MCS4302	Mobile Computing	03	O
MCS4303	Distributed Systems	02	O
MCS4304	Computer Vision	02	O
MCS4305	Embedded Systems	02	O
MCS4306	Selected Topics in Computer Science	02	O
MCS3306*	Individual Research Project	08	C*
MCS3307**	Individual Project	03	C**

* **MCS3306** is compulsory and offered only to the Master of Science Degree Programme. It spans two semesters with a total credit value of 15.

** **MCS3307** is compulsory and offered only to the Masters Degree Programme. It spans two semesters with a total credit value of 5.

MCS4301 - Systems Modelling & Simulation

This course module introduces students to the theory and practical techniques for modeling and simulating complex systems. Topics include deterministic systems, focusing on the use of difference and differential equations and their numerical solutions, as well as stochastic systems involving probability distributions, random variables, and Markov chains. Students will explore Monte Carlo simulations, discrete-time vs. discrete event simulations, and cellular automata as tools for system analysis. The course also covers the use of simulation software to model real-world systems and analyze their behavior. Through hands-on projects, students will develop the skills to design, implement, and evaluate simulations for a variety of applications in engineering, business, and science.

MCS4302 - Mobile Computing

This course module focuses on the development and implementation of mobile applications for wireless devices. Topics include mobile operating systems, with an emphasis on Android, and the anatomy of mobile apps, including the app lifecycle. Students will learn to develop applications using Android Studio, covering the Android user interface, intents, persistence, WebView, and web services. The course also explores 2D graphics, location-based apps, and mobile sensors. Additionally, students will gain experience in hybrid mobile app development (Ionic), native mobile app development (React Native), and mobile testing. Mobile security concepts, including tools like Bouncy Castle and Spongycastle, and emerging trends in mobile computing are also addressed. Through practical projects, students will gain hands-on experience in creating secure, high-performance mobile applications.

MCS4303 - Distributed Systems

This course module provides an in-depth exploration of the design, implementation, and analysis of distributed systems. Topics include fundamental concepts such as coordination, agreement, and fault tolerance, with a focus on leader election, consensus algorithms, Byzantine Fault Tolerance (BFT), and blockchain as a ledger consensus mechanism. Students will study atomic commit protocols, logical and vector clocks, as well as broadcasting methods like RBCAST, URBCAST, and ABCAST. The course also covers specialized middleware systems, including Cassandra, Zookeeper, and Spanner, and streaming technologies like Pub/Sub. Additionally, students will learn about parallel computing models such as SIMD, MIMD, Amdahl's Law, MPI, OpenMP, and GPU computing. Through practical projects and case studies, students will develop the skills to design, optimize, and evaluate scalable, fault-tolerant distributed systems, with a focus on emerging trends in the field.

MCS4304 - Computer Vision

This course module focuses on the computational techniques used to enable machines to interpret and understand visual data from the world. Topics include image processing, feature extraction, edge detection, and object recognition. Students will explore machine learning and deep learning methods, such as convolutional neural networks (CNNs), for image classification, segmentation, and detection tasks. The course also covers 3D vision, motion analysis, camera calibration, and tracking. Additionally, students will study applications of computer vision in real-world domains like autonomous vehicles, facial recognition, and medical imaging. Through hands-on projects and case studies, students will gain practical experience in implementing and evaluating computer vision algorithms and models.

MCS4305 - Embedded Systems

This course module provides an in-depth study of designing and programming embedded systems, with a focus on AVR microcontrollers. Topics include low-level programming techniques, on-board communication protocols like UART, SPI, and I2C, and their application in real-world systems. Students will also explore low-power wireless communication protocols, such as IEEE 802.15.4 and LoRa, and how to integrate these into embedded applications. The course covers the design and development of embedded software, hardware interfacing, and optimization techniques for energy efficiency and real-time performance. Through hands-on projects, students will gain practical experience in developing embedded systems for applications in IoT, robotics, and other fields.

MCS4306 - Selected Topics in Computer Science

This course module provides a focused exploration of advanced and emerging areas in the field of computer science. The course offers flexibility in its content, covering topics such as machine learning, artificial intelligence, quantum computing, cybersecurity, and advanced algorithms, depending on current trends and research interests. Students will engage with cutting-edge theories, technologies, and applications, and will have opportunities to explore specific areas in depth through readings, and discussions. This course is designed to encourage critical thinking, foster research skills, and equip students with the knowledge needed to tackle complex challenges in the rapidly evolving landscape of computer science.

GRADING SYSTEM

The percentage score obtained in respect of each course of the degree programme shall be converted into a Grade according to the scheme given below:

Grades & their Respective Grade Point Values

Range of Marks	Grade	Grade Point Value (GPV)
90 – 100	A+	4.25
80 – 89	A	4.00
75 – 79	A-	3.75
70 – 74	B+	3.25
65 – 69	B	3.00
60 – 64	B-	2.75
55 – 59	C+	2.25
50 – 54	C	2.00
45 – 49	C-	1.75
40 – 44	D+	1.25
30 – 39	D	1.00
20 – 29	D-	0.75
0 – 19	E	0.00
0	NC	0.00

*NC –Not Completed

Computation of Grade Point Average (GPA)

Computation of GPA is performed based on the formula given below.

$$GPA = \frac{\sum (GPV_i \times Credit_i)}{\sum Credit_i}$$

Where: GPV_i is the Grade Point Value for each course (on a scale from 0 to 4.25).
$Credit_i$ is the number of credit hours associated with each course.
$\sum$ denotes the sum over all the courses in the degree program entitled to the student.

ACADEMIC EXCELLENCE AWARDS

Students of each programme are entitled to the following convocation awards based on their academic excellence.

Graduation Awards (Awarded at the Convocation)

- Award for the best performance in Master of Computer Science
- Award for the best performance in Master of Science in Computer Science.

REPEATING A COURSE/ SUBJECT

- A student is allowed to retake the examination of a course at the next available opportunity. When a course examination is retaken, the highest grade achieved shall be considered for the computation of results for the award of the degree.

EXIT POINTS FROM THE DEGREE PROGRAMME

A student is able to make use of the following qualifications, to exit from the degree programme.

- Postgraduate Diploma

In order to obtain the Postgraduate Diploma qualification, the student should fulfil the following academic requirements.

- he/she has obtained a GPV of not less than 2.00 for Courses which add up or exceed 25 credits;
- he/she has obtained a minimum of 2.00 of GPA (the GPA is calculated for courses adding up to a minimum of 25 Credits using the best grades);

MINIMUM REQUIREMENT TO OBTAIN A DEGREE

The Master of Computer Science

A Student who has satisfied the following conditions will qualify to obtain the corresponding masters degree.

- not less than a GPV of 2.00 in the Courses which make up a minimum of 30 Credits;
- not less than a GPA of 2.00 for all the Courses which make up a minimum of 45 Credits; and
- not less than a C Grade (Pass) for the Individual Project.

The Master of Science in Computer Science

A Student who has satisfied the following conditions will qualify to obtain the Degree of Master of Science in Computer Science.

- not less than a GPV of 2.00 in the Courses which make up a minimum of 45 Credits;
- not less than a GPA of 2.00 for all the Courses which make up a minimum of 60 Credits; and
- not less than a C Grade (Pass) for the Individual Research Project.

A student who has opted to follow the Master of Science in Computer Science degree programme is allowed to withdraw his/her registration from that programme, provided that he/she has obtained permission from the School for such withdrawal. Instead, such student is permitted to obtain the Master of Computer Science degree subject to conditions applicable to that Degree programme.

3.2

Master of Information Technology

MASTER OF INFORMATION TECHNOLOGY

The Master of Information Technology (MIT) programme is especially designed for graduates from non-computing disciplines who aspire to enter the IT industry. Originally offered as an MSc in Information Technology from 2002 to 2004, the programme was reintroduced in 2007 with a focus on equipping individuals with limited computing knowledge for IT-related careers. The curriculum, revised in 2017 and most recently in 2025, keeps pace with advancements in the field. Covering key areas such as programming, software engineering, cybersecurity, data analysis, and AI/ML, the MIT programme prepares graduates for diverse roles, including software development, network administration, and IT management. With over 13 batches graduated by 2024, it continues to be a gateway for professionals looking to excel in the evolving tech landscape.

DURATION

Two academic years, part-time, consists of four semesters (up to 15 weeks per semester).

LECTURES

Lectures and practicals are conducted in weekends from 8.30 am to 5.45 pm.

ENTRY QUALIFICATIONS

a) A Bachelor's Degree from a University or Institution recognized by the University Grants Commission and/or the University of Colombo; **Or**
b) Any other academic or professional qualification deemed equivalent to a Bachelor's Degree by the Senate of the University of Colombo on the recommendation of the school. Provided that, each such application under the category shall be considered on a case-by-case basis; **And**
c) Meeting all additinal requirements as specified in the applicable by-laws and regulations.

ADMISSION

The selection process consists of a written test followed by an interview.

CREDIT REQUIREMENTS

Course/Subject Description	Credit Value	Direct Staff-Student Contact Hours	Notional Hours (direct staff-student contact hours and independent learning)
Lecture course	1	15	50
Laboratory course	1	30	50
Independent Study	5	variable	500

One credit is considered equivalent to 50 notional learning hours for a taught course and laboratory course. In the case of project work/ Independent Studies, one credit is considered equivalent to a minimum of 100 notional hours.

PROGRAMME STRUCTURE

The program consists of multiple courses, each carrying a specified number of credits. All courses in the first and second semesters are compulsory, while the third and fourth semesters include both compulsory and optional courses. Module descriptors for each course are available on PGVLE. To obtain the degree, students must complete the required courses and meet the minimum conditions outlined in the relevant By-Laws and Regulations.

The Course Codes, Titles, Credits and their Standing in each Semester are as follows:

SEMESTER 01

Code	Title	Credits	Compulsory / Optional
MIT1301	Program Design and Programming	3	C
MIT1302	Computer Systems	2	C
MIT1303	Database Management Systems	3	C
MIT1304	Data Communications and Computer Networks	3	C
MIT1305	Mathematics and Statistics for IT	2	C

MIT1301 - Program Design and Programming

This course introduces the fundamentals of program design and programming, focusing on the Python programming language. It aims to equip students with essential programming skills and a strong foundation in problem-solving techniques, enabling them to tackle computational tasks across various domains. The course begins with an introduction to programming concepts and Python syntax, progressing through more complex topics like object-oriented programming (OOP), data structures, and file handling. Additionally, students will learn how to work with databases and explore Python's extensive ecosystem of modules, libraries, and packages.

MIT1302 - Computer Systems

The Computer Systems course introduces students to the fundamental components of computer systems, covering both hardware and software aspects that work together to run software applications. This module spans the essential concepts, from the CPU architecture, basics of logic circuits, number representation and machine language to the organization and management of memory and the implementation of programming languages. Students will explore the complete range of abstractions, from low-level hardware to high-level programming, gaining an understanding of how computers operate at all levels. By the end of the course, students will be equipped to approach software development from a system-oriented perspective, enhancing their ability to create efficient and effective applications.

MIT1303 - Database Management Systems

This course provides a comprehensive foundation in Database Management Systems, covering both theoretical principles and practical applications. It commences with an exploration of the historical evolution and critical role of Database Management Systems (DBMS). The curriculum progresses through the Relational Data Model, Entity-Relationship (ER) concepts, relational algebra, logical database design through EER-to-relational mapping, and normalization techniques to ensure efficient schema design. Structured Query Language (SQL) is thoroughly covered, encompassing basic operations, advanced querying, and optimization techniques. The course culminates in an examination of emerging trends, including NoSQL databases and cloud-based services. Practical sessions, continuous assessments, and project work reinforce theoretical concepts and provide hands-on experience, enabling students to develop strong competencies in database design and management.

MIT1304 - Data Communications and Computer Networks

This course aims to delve into the fundamentals of data communication and transmission, computer network architecture, and channel access methods. Participants will explore the intricacies of the Internet's structure, gain a deep understanding of the TCP/IP protocol suite, and master IP addressing, subnetting, routing, and multicasting. The course offers a forward-looking perspective by introducing IPv6 and covers the nuances of transport layer protocols, including TCP and UDP. Additionally, students will explore application layer protocols, such as HTTP and FTP, and delve into the realm of wireless local area networks (WLANs) with a focus on IEEE 802.11 standards. Practical elements include hands-on labs, assignments, and a group project, ensuring participants graduate with a robust skill set for designing, implementing, and managing modern computer networks. Industry insights, guest lectures, and real-world case studies further enhance the course, preparing students for the dynamic landscape of information technology and networking.

MIT1305 - Mathematics and Statistics for IT

This course provides advanced mathematical and statistical foundations essential for postgraduate study and research in Information Technology. It enhances quantitative reasoning and analytical skills, enabling students to model complex computational problems and make data-driven decisions in modern computing environments. The course covers mathematical modeling, linear algebra, combinatorics, probability theory, calculus-based optimization, descriptive statistics, and regression modeling with statistical inference. Emphasis is placed on both theoretical understanding and practical application, allowing students to translate concepts into effective solutions. Through applied examples and problem-solving activities, students will apply these techniques to real-world IT challenges, including machine learning, data analytics, system optimization, and research design, equipping them with the analytical tools needed for innovation and evidence-based computing.

SEMESTER 02

Code	Title	Credits	Compulsory / Optional
MIT2301	Software Engineering	2	C
MIT2302	Data and Network Security	2	C
MIT2303	UI/UX Design	2	C
MIT2304	Web and Mobile Development	3	C
MIT2305	Artificial Intelligence	3	C

MIT2301 - Software Engineering

This course explores key principles and practices in software development. Beginning with an introduction to the historical evolution of software engineering and the crucial role of software engineers, the course delves into essential software quality attributes and examines various software development processes, including traditional models like the Waterfall and innovative approaches such as Agile and Prototyping. Emphasis is placed on Requirement Analysis and Specification, equipping students with skills in eliciting, documenting, and managing changing requirements. The course then progresses into Software Design, covering design principles, architectural patterns (MVC, Repository, Client-Server), and design patterns. Practical aspects of coding, coding practices, code reviews, and walkthroughs are explored, fostering the development of robust coding skills. Testing strategies and maintenance, integral to the software development life cycle, are thoroughly examined, alongside project management principles and quality management practices. Throughout the course, students engage in hands-on projects, applying learned concepts to real-world scenarios, and ultimately, emerge with a deep understanding of software engineering, proficient in designing, coding, testing, and managing software projects effectively.

MIT2302 - Data and Network Security

This course is designed to equip students with a thorough understanding of the fundamental principles and practical applications of securing digital information. The course begins with an exploration of data and network security concepts, addressing various threats and introducing policies and best practices. Subsequent weeks delve into the realm of cryptography, covering hash algorithms, symmetric and asymmetric key encryption, and key management protocols. Operating system and database security are then examined, emphasizing access controls, encryption, and secure coding practices. The course delves into program security, focusing on secure coding, testing methodologies, and application security frameworks. Topics like secure electronic mail, authentication protocols, and network security technologies are explored to provide students with a robust understanding of securing communication channels and network infrastructure. The course concludes with a focus on web security, encompassing SSL/TLS protocols and legal considerations in the realm of data and network security. Throughout the program, students engage in hands-on labs, case studies, and real-world applications to reinforce theoretical knowledge with practical skills essential for addressing contemporary challenges in the field.

MIT2303 - UI/UX Design

This course introduces students to the principles and practices of UI/UX design within the broader context of Human-Computer Interaction (HCI). It covers the cognitive aspects of user behavior, effective user interface development, and modern design methodologies. Students will learn how to design user-friendly interfaces, conduct usability testing, and build functional prototypes. The course emphasizes real-world applications through case studies, interactive lectures, and practical assignments. By the end of the course, students will be equipped to create user-centered designs and evaluate their effectiveness using various methods.

MIT2304 - Web and Mobile Development

This course immerses students in a holistic journey through the intricacies of contemporary web and mobile application development. Commencing with the fundamental elements of web technologies, students delve into client-side development, mastering HTML, CSS, and JavaScript, before progressing to server-side programming using PHP and MySQL. The course seamlessly transitions to web hosting essentials and explores solution stacks, 3-tier architecture, and web server intricacies. The mobile development segment introduces students to the intricacies of operating systems for wireless mobile devices, Android app anatomy, and the Android development environment. In-depth coverage of Android UI, intents, persistence, and web services paves the way for advanced topics like animation, graphics, location-based applications, sensing, and sensors. The course encompasses hybrid and native mobile app development, mobile testing strategies, and security considerations. The final weeks culminate in a comprehensive project, allowing students to synthesize their skills and knowledge into practical applications, fostering a well-rounded skill set essential for a successful career in web and mobile development.

MIT2305 - Artificial Intelligence

This course introduces the principles and practices of modern Artificial Intelligence, integrating theoretical foundations with hands-on development. Students explore core machine learning methods – supervised and unsupervised learning – before advancing to Artificial Neural Networks, Deep Learning, and Reinforcement Learning for adaptive decision-making. Soft computing through Fuzzy Inference Systems is also covered, equipping students to model uncertainty in real-world problems. The course examines contemporary AI architectures, including attention mechanisms and Transformer models, that underpin today's generative AI technologies. Through practical work with leading AI frameworks and tools, students build chatbots, intelligent applications, and automated media systems, while engaging with multimodal and agentic AI capable of perception, reasoning, and autonomous interaction. Ethical and societal considerations – among them bias, safety, and responsible deployment – are critically examined throughout. In guided laboratories and project work, students design and implement complete AI solutions, developing both the conceptual understanding and practical competence required to work confidently with state-of-the-art AI technologies.

SEMESTER 03

Code	Title	Credits	Compulsory / Optional
MIT3301	IT Project Management and Professional Issues	2	C
MIT3302	Platform Technologies	2	C
MIT3303	E-Learning Concepts and Technologies	2	O
MIT3304	Data Mining for Business Intelligence	2	O

MIT3301 - IT Project Management and Professional Issues

The course is divided into two main parts: Professional Issues and Project Management. In the Professional Issues section, we explore how to identify ethical issues in the workplace and address them using established ethical theories and professional codes of conduct, equipping participants with the skills to navigate ethical dilemmas effectively. Furthermore, this part examines ethical issues in Artificial Intelligence and Data Science, including responsible use, bias, privacy, accountability, and governance considerations in emerging technologies. The second part focuses on managing IT projects, beginning with identifying the business case for a project, which serves as the foundation for successful project management, followed by an exploration of essential project management processes to ensure participants are well-prepared to handle various aspects of project execution and delivery.

MIT3302 - Platform Technologies

Platform Technologies will explore the architectures and distributed systems that power modern enterprise platforms. Students will progress from foundational concepts to advanced system evolution, examining the shift from monolithic systems to modular monoliths, microservices, and serverless architectures. The course will emphasize architectural integrity through Clean Architecture and SOLID principles to prevent system decay and manage complex transactions in distributed environments. It will cover distributed systems fundamentals, including the Fallacies of Distributed Computing, and will examine key architectural trade-offs. Students will address enterprise integration, observability, performance tuning, tracing, auditing, and real user monitoring. The course will examine cloud-native practices such as containerization and secure cloud architectures. Finally, students will explore AI-augmented platform technology management, including AI agents, MCP servers, and AI-driven operations.

MIT3303 - E-Learning Concepts and Technologies

This course provides an in-depth exploration of e-learning concepts, theories, and technologies essential for modern education and training environments. Students will gain a robust understanding of learning theories such as Behaviorism, Cognitivism and Constructivism, and their application to e-learning. The course covers key technologies and tools that drive current e-learning practices, offering a comparative analysis of various platforms. The course emphasizes the planning and management of e-learning projects employing methodologies such as Scrum and Iterative Waterfall. The students will learn to evaluate e-learning effectiveness through metrics and feedback mechanisms to ensure continuous improvement. In the design and development module, students will delve into instructional system development methodologies like ADDIE and SAM, creating engaging multimedia content and incorporating interactive elements. The course covers best practices for delivering online learning courses through learning support systems such as LMS and LXP and integrating them with other related systems for human capacity development. Emerging trends such as Artificial Intelligence and Virtual and Augmented Reality are explored, providing insights into future innovations in e-learning. Practical applications are emphasized through hands-on development activities and analysis of real-world case studies, allowing students to apply theoretical knowledge to practical scenarios. The course also addresses professional and ethical issues in e-learning, including copyrights, intellectual property rights, and industry standards. By the end of the course, students will be equipped with the skills and knowledge to design, manage, and innovate in e-learning environments, preparing them for future challenges and opportunities in the field.

MIT3304 - Data Mining for Business Intelligence

This course provides a comprehensive exploration of data mining techniques and their applications in business intelligence. Students will begin with foundational concepts, including the importance of data mining and its role within the broader scope of data warehousing and OLAP systems. Key topics include data preprocessing techniques essential for preparing raw data for analysis, and methods for representing and interpreting mining results. The course delves into a variety of data mining algorithms, focusing on classification techniques such as decision trees, random forests, and support vector machines, as well as clustering methods like K-Means and DBSCAN. Students will learn to evaluate model performance using metrics such as accuracy, precision, recall, and AUC, and explore advanced techniques like association rule mining, text mining, and anomaly detection. Emerging trends in the field, including big data analytics, real-time mining, and the integration of AI and deep learning, will be discussed. The course emphasizes practical applications through hands-on projects using real business data, enabling students to apply theoretical knowledge to real-world scenarios. By the end of the course, students will gain the skills necessary to effectively use data mining tools and techniques to derive actionable insights, making them well-prepared for careers in data science, business analysis, and related fields.

SEMESTER 04

Code	Title	Credits	Compulsory / Optional
MIT4301	Independent Study	5	C
MIT4302	Software Quality Assurance	2	C
MIT4303	e-Business Applications and Strategies	2	O
MIT4304	Multimedia and Graphic Design	2	O

MIT4301 - Independent Study

In the Fourth Semester of the Master's Degree Programme, students are required to undertake an Independent Study, a comprehensive project designed to deepen their understanding of a selected topic and demonstrate their practical and analytical skills. This course provides an opportunity for students to explore a unique topic of their choice, guided by a dedicated Supervisor. Students will begin by selecting a topic from a list compiled by the Course Coordinator, sourced from Supervisor recommendations. The Supervisor will mentor each student, aiding in topic selection, resource acquisition, critical thinking, and analysis through regular meetings to ensure progress and address challenges. The core deliverables of the course include a Self-Reflection Report/Portfolio and a practical Application demonstration. The Self-Reflection Report must showcase the student's proficiency in problem-solving methodologies, systematic information presentation, and data analysis. It should reflect their ability to apply theoretical knowledge to practical situations by developing, implementing, and proposing solutions to real-world problems. The Application demonstration, accompanied by inline code verification and progress evidence through a source code repository, is integral to the assessment. This course is pivotal in demonstrating students' capacity to conduct independent research and apply their learning to practical scenarios.

MIT4302 - Software Quality Assurance

The Software Quality Assurance course provides an in-depth exploration of the principles, methodologies, and tools essential for ensuring high-quality software products. Designed for MIT degree candidates, this course covers the entire lifecycle of software quality assurance, from pre-project planning to maintenance and continuous improvement. Students will delve into key quality factors, including reliability, usability, and maintainability, and explore industry standards and certification processes. The course emphasizes both theoretical and practical aspects, starting with foundational software quality concepts and progressing to hands-on experience with advanced tools and techniques. Topics include software testing strategies, test case design, defect management, and the use of automation tools such as Selenium and TestNG. Students will also learn about mobile application testing with Appium and gain insights into continuous integration and build tools like Jenkins and GitLab CI. Students will engage in group projects to apply their knowledge in real-world scenarios. The course concludes with an examination of emerging trends in quality assurance, such as AI-driven testing and quality assurance in Agile and DevOps environments. By the end of the course, students will be equipped with a comprehensive understanding of software quality assurance practices and be prepared to implement effective strategies in various software development contexts.

MIT4303 - e-Business Applications and Strategies

This course provides an in-depth exploration of the dynamic field of e-Business, focusing on the integration of technology and strategy to drive business success in the digital age. Students will gain a comprehensive understanding of the e-Business environment, including key trends, technologies, and competitive strategies shaping the industry. The course covers essential topics such as e-Business application development tools, enabling students to design and implement effective digital solutions. Emphasis is placed on e-Customer Relationship Management (e-CRM), where students will learn to leverage CRM systems to enhance customer interactions and satisfaction. E-Procurement and supply chain management are examined to understand how digital tools streamline procurement processes and improve supply chain efficiency. The course also delves into electronic payment systems, exploring various methods and technologies for secure and efficient transactions. Security in e-Business is a critical focus, with students learning to address risks, protect assets, and ensure compliance with relevant regulations. e-Marketing strategies are covered, equipping students with the skills to develop and execute successful digital marketing campaigns. Legal and ethical considerations in e-Business are addressed, including data privacy, intellectual property, and corporate responsibility. The course concludes with a look at future directions in e-Business, exploring emerging technologies and trends that will shape the industry's future. Practical projects and case studies provide hands-on experience, allowing students to apply theoretical knowledge to real-world scenarios. By the end of the course, students will be well-equipped to navigate the complexities of e-Business and drive strategic growth in a digital landscape.

MIT4304 - Multimedia and Graphic Design

The course is designed to provide learners with a comprehensive understanding of modern graphics design and multimedia production techniques, emphasizing cutting-edge tools and emerging trends. The course balances foundational principles with hands-on practice, enabling participants to develop both creative and technical expertise.

Participants will delve into 2D design concepts, exploring color theory, typography, and vector-based graphics using industry-standard software such as Adobe Illustrator. The course transitions into 3D design, covering essential modeling techniques, texturing, lighting, and rendering using tools like Blender and Maya. Learners will explore advanced topics, including procedural modeling, particle systems, and real-time physics simulations, to create visually compelling and realistic 3D content. In line with current trends, the course introduces AI-powered tools for design automation and generative media creation. Learners will also explore immersive media design for virtual and augmented reality, developing interactive experiences with platforms like Unity or Unreal Engine. Motion graphics and visual effects are integral components, focusing on keyframe animation, compositing, and dynamic simulations.

Throughout the course, participants will gain insights into industry advancements, such as real-time rendering, the metaverse, and cloud-based collaboration. The program culminates in a portfolio-building session, where learners showcase their multimedia projects, preparing them for professional opportunities in gaming, animation, and interactive media. By the end of this course, participants will be proficient in designing 2D/3D graphics, leveraging emerging technologies, and creating interactive multimedia experiences. Whether pursuing careers in design, gaming, or immersive media, learners will leave equipped with the skills to thrive in the evolving digital landscape.

GRADING SYSTEM

The percentage score obtained in respect of each course of the degree programme shall be converted into a Grade according to the scheme given below:

Range of Marks, Grades & their Respective Grade Point Values

Range of Marks	Grade	Grade Point Value (GPV)
90 – 100	A+	4.25
80 – 89	A	4.00
75 – 79	A-	3.75
70 – 74	B+	3.25
65 – 69	B	3.00
60 – 64	B-	2.75
55 – 59	C+	2.25
50 – 54	C	2.00
45 – 49	C-	1.75
40 – 44	D+	1.25
30 – 39	D	1.00
20 – 29	D-	0.75
0 – 19	E	0.00
0	NC,CN	0.00

NC - Not Complete, CN - Cancelled

*Note: The examination branch of the School may use additional status codes such as NA (Not Applicable), WH (Withheld), and AB (Absent) to represent the intermediate status of student results.

Computation of Grade Point Average (GPA)

Computation of GPA is performed based on the formula given below.

$$GPA = \frac{\sum (GPV_i \times Credit_i)}{\sum Credit_i}$$

Where: GPV_i is the Grade Point Value for each course (on a scale from 0 to 4.25).
$Credit_i$ is the number of credit hours associated with each course.
$\sum$ denotes the sum over all the courses in the degree program entitled to the student.

ACADEMIC EXCELLENCE AWARDS

Students are entitled to the following convocation awards based on their academic excellence.

Graduation Awards (Awarded at the Convocation)

- JICA award for the best performance in Master of Information Technology

REPEATING A COURSE/ SUBJECT

- A student is allowed to retake the examination of a course at the next available opportunity. When a course examination is retaken, the highest grade achieved shall be considered for the computation of results for the award of the degree.

EXIT POINTS FROM THE DEGREE PROGRAMME

A student is able to make use of the following qualifications, to exit from the degree programme.

- Postgraduate Diploma

In order to obtain the Postgraduate Diploma qualification, the student should fulfil the following academic requirements.

- he/she has obtained a GPV of not less than 2.00 for Courses which add up or exceed 25 credits;
- he/she has obtained a minimum of 2.00 of GPA (the GPA is calculated for courses adding up to a minimum of 25 Credits using the best grades);

MINIMUM REQUIREMENT TO OBTAIN A DEGREE

1) The minimum conditions which a student shall satisfy for the award of the Master of Information Technology shall be as follows:
   a) obtained not lower than C grade (GPV of 2.00) in the Courses which make up a minimum of 30 Credits
   b) obtained not less than a GPA of 2.00 for all the Courses which make up a minimum of 40 Credits; and
   c) obtained not less than a C Grade (Pass) for the Independent Study.
2) Once the relevant Board of Study has decided to award the Degree, the student is no longer eligible to continue the Programme, and all pending results shall be rendered null and void.
3) No student shall be entitled to the award of the Master of Information Technology unless such student has satisfied all other relevant requirements and such student has supplicated for the award of the Master's Degree at the relevant Convocation of the University.

Note: As a fallback option, students who meets the conditions specified in the relevant By-Laws or Regulations may choose to obtain a Postgraduate Diploma.

3.3

Master of Information Security

MASTER OF INFORMATION SECURITY

The Master of Information Security program is designed for graduates seeking advanced knowledge and expertise in information security. This program covers a broad spectrum of topics, equipping students with the necessary skills to protect digital assets, manage security threats, and ensure compliance with security standards. The curriculum offers a diverse range of subjects within the information security domain, providing both theoretical foundations and practical applications. Additionally, students have the opportunity to engage in research, allowing them to explore emerging challenges and innovations in the field. Upon successful completion, graduates will be well-prepared for careers in cybersecurity, incident response and threat management, cloud and network security, digital forensics and cybercrime investigation, information systems auditing, and research and academia. This program serves as a strong foundation for professionals aiming to contribute to the rapidly evolving information security landscape.

DURATION

Two academic years, part-time, consists of four semesters (up to 15 weeks per semester).

LECTURES

Lectures and practicals will be conducted according to the time table.

ENTRY QUALIFICATIONS

(a) A Bachelor's Degree from a University or Institution recognized by the University Grants Commission and/or the University of Colombo; or

(b) Any other academic or professional qualification equivalent to a Bachelor's Degree as may be determined by the Senate of the University of Colombo on the recommendation of the School: Provided that, each such application under this category shall be considered on a case-by-case basis; and

(c) Attaining the minimum performance score in a selection test such as the General Computing Aptitude Test (GCAT); and

(d) Fulfilling additional prerequisites such as an interview, availability of vacancies, and payment of the relevant fees.

ADMISSION

The selection process consists of a written test followed by an interview.

CREDIT REQUIREMENTS

Course/Subject Description	Credit Value	Direct Staff-Student Contact Hours	Notional Hours (direct staff-student contact hours and independent learning)
Lecture course	1	15	50
Laboratory course	1	30	50
Individual project/ Independent Study	5	variable	500

One credit is considered equivalent to 50 notional learning hours for a taught course and laboratory course. In the case of project work/ Independent Studies, one credit is considered equivalent to a minimum of 100 notional hours.

PROGRAMME STRUCTURE

The programme has a number of courses and each course will carry a specified number of credits. Module descriptors for each course are available on VLE.

All four semesters consist of compulsory courses. Each student shall submit assignments as part of continuous assessment set by the school.

SEMESTER 01

Code	Title	Credits	Compulsory / Optional
MIS1301	Security Fundamentals and Concepts	3	C
MIS1302	Secure Network Design and Standards	3	C
MIS1303	Information Security Governance	3	C
MIS1304	Cybersecurity and Law	2	C

MIS1301 - Security Fundamentals and Concepts

The goal of this course is to build a strong foundation in information security by introducing its core principles and practical applications. Students will first understand the information security lifecycle and risk management, including assets, threats, and vulnerabilities. They will then examine common threats and malicious software, followed by learning security models that provide structured approaches to protecting information. The course further aims to develop knowledge of cryptography, covering symmetric and asymmetric techniques and their real-world uses. Finally, learners will explore security domains and applications to understand how these concepts are applied across diverse environments.

MIS1302 - Secure Network Design and Standards

The goal of this course is to provide learners with a strong foundation in designing secure, resilient, and high-performance networks aligned with modern standards. Students will begin by understanding the principles of a modern secure network and the network lifecycle, followed by exploring design approaches, useful models, and standards for secure networks. The course aims to develop skills in managing network risk and complexity, analyzing software and hardware failures, and modeling performance degradation and failure scenarios. Learners will also gain knowledge of advanced technologies such as Software Defined Networking (SDN), Network Function Virtualization (NFV), and High-Performance Computing (HPC) with ultra-low latency networking. Additional topics include time synchronization and timestamping, traffic patterns (unicast, multicast, broadcast), and cloud networking fundamentals with a focus on cloud security principles.

MIS1303 - Information Security Governance

This course equips managers and executives with knowledge to design and govern an effective information security program. It covers industry best practices and frameworks, including COBIT 5, ISO/IEC 27001:2022, and CMMI to establish governance structures, policies, and processes that protect information assets and support organizational objectives.

Effective information security governance lays out the vision and direction for the security program. Participants will learn how to establish a security function and governance committee, develop security policies and a strategic roadmap, implement an Information Security Management System (ISMS) aligned with ISO/IEC 27001:2022, and continuously improve the security posture. Emphasis is on executive-level concerns such as accountability, compliance, and measuring security maturity. With proper governance, organizations can improve trust and reputation and reduce regulatory or business risks, turning information security into a business enabler.

MIS1304 - Cybersecurity and Law

This course introduces Master's level Information Security students to the legal and regulatory environment governing cyberspace and digital technologies. It begins with an overview of legal systems and fundamental concepts of cybercrime, followed by an examination of evidence and the principles governing the identification, collection, and handling of digital evidence in cyber investigations. The course then examines key legal issues relevant to cybersecurity practice, including computer-related offences, electronic and digital transactions, financial cybercrime, and intellectual property issues arising in digital environments. Students will also study the principles and regulatory frameworks related to data protection and privacy, as well as legal challenges associated with online content regulation. The course concludes with discussions on cyber ethics, professional responsibility, and current and emerging legal challenges in cyberspace, enabling information security professionals to understand the legal implications of cybersecurity activities and operate responsibly within applicable legal and regulatory frameworks.

SEMESTER 02

Code	Title	Credits	Compulsory / Optional
MIS2301	Security Architecture and Design	3	C
MIS2302	Data Security Management and Artificial Intelligence	3	C
MIS2303	Risk Management and Compliance Strategy	3	C
MIS2304	Cloud and Network Security	3	C
MIS2305	Security Psychology and Human Factors	2	C

MIS2301 - Security Architecture and Design

The goal of this course is to develop a deep understanding of secure architecture principles and their application in designing high-assurance systems. Students will master key concepts such as segregation of duties, least privilege, zero-trust models, and fail-secure approaches, evaluating organizational frameworks against these rigorous standards to ensure structural integrity. By focusing on the NIST SP 800-160 lifecycle and the mathematical foundations of trust, including Bell-LaPadula and Biba models, the curriculum explores the formal logic required to align technical blueprints with business objectives.

Advanced modules address the "Architect's Dilemma" by balancing rigorous protection with system performance, utilizing the R-O-S-E Method to mitigate the latency tax of modern controls. Learners will execute complex modernization strategies, employing Strangler Fig patterns and Anti-Corruption Layers to wrap legacy technical debt in secure, modern facades. The course concludes with a focus on architectural governance and supply chain integrity, preparing future leaders to justify design trade-offs and ensure long-term robustness in evolving enterprise environments.

MIS2302 - Data Security Management and Artificial Intelligence

This course provides a comprehensive introduction to managing and protecting data in modern digital ecosystems, with a particular emphasis on the growing influence of artificial intelligence. Students will learn essential data security concepts, including data classification, access control, encryption, privacy protection, and database security. The course also explores data governance frameworks and data security architecture design, addressing contemporary risks such as IoT vulnerabilities, data leakage, and evolving cyber threats. Building on foundational AI and machine learning principles, learners will examine AI-enabled security techniques, anomaly detection, adversarial attacks, and strategies for securing AI/ML models and data pipelines. This course prepares students to navigate the intersection of data security and AI-driven technologies.

MIS2303 - Risk Management and Compliance Strategy

Risk Management and Compliance Strategy offers a comprehensive understanding of how modern organizations integrate governance, risk, and compliance across legal, IT, and executive functions. The course examines the evolution of GRC, behavioral influences on integrity, and organizational dynamics that shape ethical decision-making. Students learn quantitative risk modeling, global governance frameworks including SOX, DORA, and ESG mandates, and techniques for scoping authorization boundaries, impact analysis, and assessing supply-chain dependencies. Additional modules cover control selection, residual-risk evaluation, AI governance under emerging regulatory standards, and continuous posture management through real-time monitoring. By the end of the course, learners will be prepared to design risk-adjusted performance measures and build resilient, enterprise-wide compliance and governance strategies.

MIS2304 - Cloud and Network Security

The goal of this course is to equip learners with a strategic understanding of cloud and network security principles and practices. Students will begin by mastering the fundamentals of cloud computing, including service and deployment models, the shared responsibility model, and core security principles. The course aims to develop knowledge of cloud security governance frameworks such as NIST and CSA, and practical approaches to securing cloud infrastructure through identity and access management, encryption, and secure configuration. Learners will gain insights into cloud networking security, including VPC segmentation and secure routing, and explore advanced practices such as Zero Trust, Software-Defined Perimeter (SDP), CASB (Cloud Access Security Broker), container and Kubernetes security, and cloud-native security automation. The course also covers essential network security fundamentals; firewalls, VPNs, IDS/IPS, and NAC, and emerging trends such as Secure Access Service Edge (SASE), and hybrid security models, enabling participants to make informed decisions at the management level.

MIS2305 - Security Psychology and Human Factors

The goal of this course is to help learners understand the human factors that influence information security and how to design strategies that address them effectively. Students will explore the psychology behind security, including cognitive biases, decision-making under uncertainty, behavioral profiling, and why individuals bypass security controls. The course aims to build knowledge of social engineering techniques and psychological principles behind attacks such as phishing, pretexting, and tailgating. Learners will analyze human error in security incidents, insider threats, and models for improving human reliability, while also learning to design systems that minimize error. Additionally, the course focuses on creating a strong security culture, developing effective awareness programs, and communicating security concepts to non-technical audiences using clear, empowering methods. Finally, students will examine HR's role in security, principles of usable security and interface design, and approaches for measuring and improving human factors in security.

SEMESTER 03

Code	Title	Credits	Compulsory / Optional
MIS3301	Software Application Security	3	C
MIS3302	Security Operations	3	C
MIS3303	Business Continuity and Incident Management	2	C
MIS3304	Special Topics in Information Security	2	C
MIS3305	Individual Project	5	C

MIS3301 - Software Application Security

Software Application Security provides a practical and modern introduction to securing applications throughout the entire software development lifecycle. The course emphasizes the shift from traditional perimeter-focused security to embedding security within Agile and DevSecOps practices. Students learn to define security requirements, identify misuse and abuse cases, and apply defensive coding techniques aligned with industry standards such as the OWASP Top 10. Key modules cover secure code review, secrets management, pre-commit checks, and automated security testing in CI/CD pipelines. Learners also explore application security testing cycles, software composition analysis, and governance considerations for deployment. The course concludes with an overview of mobile application architectures, common mobile security weaknesses, and the OWASP Mobile Top 10. Graduates will be prepared to integrate security seamlessly into modern software delivery pipelines.

MIS3302 - Security Operations

TThis course provides postgraduate students with a comprehensive understanding of security operations from a governance, management, and strategic leadership perspective. Designed for professionals advancing into senior roles such as CISOs, SOC Managers, Security Directors, and Digital Governance Leaders, it emphasizes informed decision making in complex operational environments. Students examine the governance frameworks that shape Security Operations Centers (SOCs) and how security operations integrate with enterprise risk management, organizational strategy, and regulatory obligations. The curriculum covers threat monitoring, detection models, threat intelligence management, and the strategic oversight of incident response. Advanced topics include evaluating SOAR capabilities, assessing MSS/MDR/XDR services, and developing effective security metrics. The course concludes with SOC maturity assessment, workforce planning, and emerging trends influencing the future of security operations.key performance indicators. The course culminates with workforce management strategies, SOC maturity assessment frameworks, compliance and audit alignment, and emerging trends that will shape the future of security operations. By the conclusion of this course, students will be equipped to design, govern, evaluate, and continuously improve security operations capabilities within complex organizational environments.

MIS3303 - Business Continuity and Incident Management

The goal of this course is to equip learners with the knowledge and skills to design and manage robust business continuity and incident management programs. Students will understand the foundations of continuity planning and incident response, conduct Business Impact Analysis (BIA), and integrate its outcomes into continuity strategies. The course aims to develop proficiency in creating Business Continuity Planning (BCP) frameworks, implementing Disaster Recovery (DR) and service continuity measures, and applying mitigative techniques and controls. Learners will also explore incident response management, link continuity and incident programs to corporate governance, and develop organizational policies for resilience. Finally, the course covers crisis communication, stakeholder management, integration with enterprise risk management (ERM), use of maturity models (BSI, NIST, FFIEC), and auditing and reporting practices to ensure program effectiveness.

MIS3304 - Special Topics in Information Security

This course provides an advanced exploration of the rapidly evolving technologies of the information security landscape. This course adopts a seminar-based approach, engaging with academics, industry practitioners and research experts to discuss bleeding-edge topics, ranging from security in data science, communication, secure software development, process automation and to industry practices. Students will move beyond foundational theory to analyse real-world disruptions, evaluate emerging defensive frameworks, and synthesise diverse expert perspectives to predict and mitigate the security challenges of tomorrow.

MIS3305 - Individual Project

The Individual Project is a high-level, two-semester implementation project that challenges students to design and implement an original, high-impact solution to a real-world problem in the information security domain. The core of the project is innovation, whether through the development of a new security tool, the optimisation of an existing defensive framework, or the novel application of security protocols to emerging technologies. Over one year, students will navigate the full project lifecycle from presenting the proposal, an interim progress demonstration, final thesis and a viva voce defense.

SEMESTER 04

Code	Title	Credits	Compulsory / Optional
MIS4301	Information Security Assessments and Audit	3	C
MIS4302	Independent Studies of Information Security	5	C

MIS4301 - Information Security Assessments and Audit

This course delivers a comprehensive framework for the cybersecurity audit lifecycle, from foundational governance to technical execution. Students will master the methodologies needed to plan and conduct internal, external, and risk-based audits while navigating complex regulatory landscapes. The curriculum emphasizes the practical application of audit tools, including SIEM systems and vulnerability scanners,to collect evidence and identify control gaps across administrative, technical, and physical domains.
Through hands-on exploration of risk management and vulnerability scoring, participants learn to translate technical findings into actionable executive reports. The course also addresses modern challenges such as cloud security, the shared responsibility model, and third-party risk. This program culminates in an integrated audit simulation, requiring students to perform end-to-end fieldwork, root-cause analysis, and a final presentation of audit findings.

MIS4302 - Independent Studies of Information Security

This course is a dynamic, task-oriented module designed to build versatile, hands-on expertise across the diverse avenues of the information security landscape. Each week, students are challenged with an independent technical or strategic task, ranging from penetration testing and log analysis to risk assessment and secure software implementation. Students must operate autonomously to solve these challenges, providing documented evidence of their solutions for expert evaluation. Finally the students have to compile a Portfolio, where they should synthesise their weekly outputs, critically reflect on their technical growth, and demonstrate their readiness to handle the multifaceted demands of a modern security practitioner.

A student may undertake MIS 3305 in the Third Semester or opt to undertake MIS 4302 in the Fourth Semester. MIS 3305 shall span into the Fourth Semester as well. A student shall take either MIS 3305 or MIS 4302.

The syllabus applicable to each course shall be prescribed by the school from time to time and as approved by the Academic Syndicate.

GRADING SYSTEM

The percentage score obtained in respect of each course of the degree programme shall be converted into a Grade according to the scheme given below:

Grades & their Respective Grade Point Values

Range of Marks	Grade	Grade Point Value (GPV)
90 – 100	A+	4.00
80 – 89	A	4.00
75 – 79	A-	3.75
70 – 74	B+	3.25
65 – 69	B	3.00
60 – 64	B-	2.75
55 – 59	C+	2.25
50 – 54	C	2.00
45 – 49	C-	1.75
40 – 44	D+	1.25
30 – 39	D	1.00
20 – 29	D-	0.75
0 – 19	E	0.00
0	NC	0.00

NC –Not Completed

Computation of Grade Point Average (GPA)

$$GPA = \frac{\sum (GPV_i \times Credit_i)}{\sum Credit_i}$$

Where: GPV_i is the Grade Point Value for each course (on a scale from 0 to 4.00).
$Credit_i$ is the number of credit hours associated with each course.
$\sum$ denotes the sum over all the courses in the degree program entitled to the student.

ACADEMIC EXCELLENCE AWARDS

Students of each programme are entitled to the following convocation awards based on their academic excellence.

Graduation Awards (Awarded at the Convocation)

- Asiriyal de Zoysa memorial award for the best performance in Master of Information Security

REPEATING A COURSE/ SUBJECT

- A student who obtains less than C grade after the evaluation of any course will be allowed to re-sit for the evaluation of that course provided that the course is offered. The higher mark of the reappearances will be taken into consideration.

EXIT POINTS FROM THE DEGREE PROGRAMME

A student is able to make use of the following qualifications, to exit from the degree programme.

- Postgraduate Diploma

In order to obtain the Postgraduate Diploma qualification, the student should fulfil the following academic requirements.

- he/she has obtained a C grade (GPV of 2.00) for the Courses which add up or exceed 25 Credits;
- he/she has obtained a minimum of 2.00 of GPA ;

MINIMUM REQUIREMENT TO OBTAIN A DEGREE

A Student who has satisfied the following conditions will qualify to obtain the corresponding masters degree.

- he/she has obtained not lower than C grade (GPV of 2.00) in the Courses which make up a minimum of 30 Credits;
- he/she has obtained not less than a GPA of 2.00 for all the Courses which make up a minimum of 43 Credits; and
- he/she has obtained not less than a C Grade (Pass) for the Independent Studies/Individual Project.

3.4

Master of Business Analytics

MASTER OF BUSINESS ANALYTICS

The Master of Business Analytics (MBAnalytics) program at the University of Colombo School of Computing (UCSC) was introduced in 2018 to address the growing demand for skilled professionals in data science and business analytics both locally and internationally. Designed as a two-year postgraduate program, it equips students with the analytical, computational, and decision-making skills required to address complex business challenges through data-driven approaches.

The updated curriculum strengthens the program by incorporating emerging areas such as artificial intelligence–driven decision making, big data analytics, text analytics, and computational social science, while continuing to provide strong foundations in business statistics, data programming, machine learning, data management, and information visualization. The program also emphasizes practical application through courses on analytics for process improvement, stakeholder communication, and an individual research project or independent studies, enabling students to apply analytical methods to real-world business problems.

Since its inception, three cohorts have successfully graduated as of 2025, further strengthening the industry's pool of skilled data scientists and analytics professionals.

DURATION

Two academic years, part-time, consists of four semesters (up to 15 weeks per semester).

LECTURES

Lectures and practicals will be conducted according to the time table.

ENTRY QUALIFICATIONS

(a) A Bachelor's Degree from a University or Institution recognized by the University Grants Commission and/or the University of Colombo; or

(b) Any other academic or professional qualification equivalent to a Bachelor's Degree as may be determined by the Senate of the University of Colombo on the recommendation of the School: Provided that, each such application under this category shall be considered on a case-by-case basis; and

(c) Attaining the minimum performance score in a selection test such as the General Computing Aptitude Test (GCAT); and

(d) Fulfilling additional prerequisites such as an interview, availability of vacancies, and payment of the relevant fees.

ADMISSION

The selection process consists of a written test followed by an interview.

CREDIT REQUIREMENTS

Course/Subject Description	Credit Value	Direct Staff-Student Contact Hours	Notional Hours (direct staff-student contact hours and independent learning)
Lecture course	1	15	50
Laboratory course	1	30	50
Individual project/ Independent Study	5	variable	500

One credit is considered equivalent to 50 notional learning hours for a taught course and laboratory course. In the case of project work/ Independent Studies, one credit is considered equivalent to a minimum of 100 notional hours.

PROGRAMME STRUCTURE

The programme has a number of courses and each course will carry a specified number of credits. Module descriptors for each course are available on VLE. All courses in the Master of Business Analytics programme are compulsory, except for the Independent Studies in Business Analytics and the Individual Project. Students are required to select and complete one of these two options in order to fulfill the program requirements.

SEMESTER 01

Code	Title	Credits	Compulsory / Optional
BA1101	Business Statistics	3	C
BA1102	Organizational Data Management	2	C
BA1103	Fundamentals of Data Science and Business Analytics	3	C
BA1104	Data Programming	3	C

BA1101 - Business Statistics

This course aims to introduce statistical tools essential for Business Analytics. It equips students with the ability to collect, analyze, interpret, and critically evaluate business data using appropriate graphical and numerical statistical techniques and software tools. Emphasis is placed on applying probability theory and statistical reasoning to support data-driven decision-making in real-world business contexts, while developing the analytical judgment required to assess the suitability and limitations of statistical methods and tools.

BA1102 - Organizational Data Management

This course provides students with a comprehensive understanding of how organizational data is structured, governed, and managed to support effective decision-making and business analytics. It examines the strategic and operational roles of data management and data governance in modern organizations, focusing on policies, standards, stewardship responsibilities, and data management maturity frameworks. Students learn how organizational data architectures guide the collection, storage, integration, and use of data across information systems. The course introduces key concepts such as master data management, metadata management, and data quality dimensions that ensure consistency, reliability, and compliance of organizational data assets. A major component of the course focuses on database management systems and relational database design. Students develop skills in conceptual and logical data modeling using Entity–Relationship (ER) diagrams, ER-to-relational mapping, and normalization techniques. They also gain practical experience in database implementation using Structured Query Language (SQL) for data definition, manipulation, and querying. In addition, the course introduces NoSQL database concepts and the CAP theorem to highlight modern data management approaches. Fundamental data security principles, threats, vulnerabilities, and protection mechanisms are also discussed to ensure the safe management of organizational data.

BA1103 - Fundamentals of Data Science and Business Analytics

This compulsory first-semester course provides a comprehensive foundation in data science and business analytics, integrating theory with practical application. Students are introduced to the data science lifecycle, exploratory data analysis, predictive modeling, and machine learning, with emphasis on solving real-world business problems. The course combines lectures, tutorials, and independent learning with hands-on labs, case studies, and a guided mini-project to ensure experiential learning. Key topics include big data concepts, data wrangling, handling missing data, supervised and unsupervised learning, neural networks, distributed systems, Hadoop ecosystem, and distributed databases. Ethical considerations and fairness in analytics projects are also addressed.

BA1104 - Data Programming

Mus.analytics. It focuses on the use of Python and modern data science libraries to manipulate, analyze, and visualize data effectively. Students learn core programming concepts, including data structures, control structures, and functions, and apply these concepts to develop data-driven solutions. The course emphasizes practical data programming skills required for handling real-world datasets, including data cleaning, transformation, exploratory data analysis, and visualization using commonly used analytics libraries such as NumPy, Pandas, and visualization packages. Students also gain exposure to basic statistical analysis, simple predictive modeling, and reproducible analytics workflows. Through hands-on programming exercises and applied assignments, the course enables students to develop robust and efficient data analysis solutions and apply programming techniques to support data-driven decision-making in business contexts.

SEMESTER 02

Code	Title	Credits	Compulsory / Optional
BA2101	Statistical Inference for Analytics	3	C
BA2102	Machine Learning	3	C
BA2103	Data Warehousing and Mining	3	C
BA2104	Information Visualization	3	C
BA2105	AI-Powered Decision Making	2	C

BA2101 - Statistical Inference for Analytics

This course aims to develop students' ability to draw valid conclusions from data using statistical inference techniques essential for analytics-driven decision-making. It focuses on sampling distributions, estimation, hypothesis testing, and statistical modeling, enabling students to quantify uncertainty, test business-relevant claims, and communicate inferential results effectively. Emphasis is placed on correct method selection, interpretation of outcomes, and practical implications for analytics and decision support.

BA2102 - Machine Learning

This course aims to provide students with a solid theoretical foundation and practical experience in machine learning techniques relevant to business analytics. The course focuses on supervised and selected unsupervised learning methods, model development, evaluation, and optimization, with an emphasis on translating business problems into machine learning tasks. Through hands-on experimentation and analysis, students learn to build, compare, interpret, and fine-tune machine learning models to support data-driven business decision-making.

BA2103 - Data Warehousing and Mining

This course introduces the concepts of Data Mining and Data Warehousing and their applicability to the modern-day data science landscape. Students will be introduced to critical components of them and use these components to design data warehouses and Data Mining solutions to support and provide efficient and practical solutions to business problems. The core content of the course includes; Data Mining: Fundamentals of data mining, Knowledge extraction process, Data Cleaning and data exploration, Attribute Subset Selection, Data Mining Techniques (Market Basket Analysis, Classification Analysis, Cluster Analysis), and Web mining. Data Warehousing: Introduction to data warehousing, Data warehouse architectures, Multidimensional data model, Concept hierarchies, Attribute generalizations and relevance, Online analytical process, Data Cubes and their operations;

BA2104 - Information Visualization

Effective visualizations can reveal patterns, trends, and anomalies in data that might otherwise require extensive statistical analysis to uncover. This course introduces the principles and techniques of information visualization and visual analytics for exploring and communicating real-world data. It covers the purpose and functions of visualization, types of data and visual encoding methods, and fundamental design principles that guide the organization and representation of information. The course also examines perceptual and cognitive aspects of visualization, including visual perception, Gestalt principles, colour usage, layout design, animation, and interaction techniques, together with methods for evaluating and deconstructing visualizations. Visualization is further explored as a tool for exploratory data analysis, including data wrangling, visualization of statistical relationships, graphical hypothesis exploration, and visual analytics. By the end of the course, students will be able to design clear, accurate, and effective visual representations that support analytical reasoning and data-driven decision-making.

BA2105 - AI-Powered Decision Making

This course explores how Artificial Intelligence technologies support and enhance decision-making in modern organizations. It introduces the use of predictive and prescriptive analytics, intelligent decision support systems, and AI-powered analytics platforms in business decision processes. Students learn how to interpret AI-generated insights, evaluate alternative decisions, and apply data-driven approaches to strategic and operational problems. The course also examines human–AI collaboration, explainable AI, and ethical considerations such as bias, transparency, and responsible AI use. Through case studies and practical exercises, students develop the ability to apply AI-assisted insights to real-world organizational decision-making contexts.

SEMESTER 03

Code	Title	Credits	Compulsory / Optional
BA3101	Modelling and Simulation of Data	2	C
BA3102	Text Analytics	2	C
BA3103	Computational Social Science	2	C
BA3104	Individual Project (Teach Research Methods)	5	O
BA3105	Business Communication for Analysts	2	C

BA3101 - Modelling and Simulation of Data

This course introduces students to the fundamental principles and practical techniques used to model, simulate, and analyze complex business systems. The course focuses on the use of simulation as a decision-support tool to evaluate system performance and forecast business outcomes under uncertainty. Key topics include random number generation, probability distributions, input and output data modelling, Monte Carlo simulation, and discrete-event simulation techniques. Students will learn how to develop simulation models of business processes such as queueing systems, service operations, and resource allocation scenarios. The course emphasizes data-driven modelling, including parameter estimation, distribution fitting, and statistical analysis of simulation outputs to support informed business decisions.In addition, the course addresses model verification and validation techniques to ensure the credibility and reliability of simulation results. Through practical exercises and case-based analysis, students gain experience in applying simulation methods to evaluate alternative system configurations and compare business scenarios.By the end of the course, students will be able to apply modelling and simulation techniques to analyze complex systems, assess uncertainty, and provide evidence-based recommendations for improving business processes and operational efficiency. This course equips students with analytical tools that complement predictive analytics and support strategic decision-making in modern data-driven organization.

BA3102 - Text Analytics

This course provides an introduction to text analytics, focusing on methods for extracting meaningful information and insights from large collections of textual data. Students will learn the complete workflow of text analytics, starting with data collection and text preprocessing, followed by techniques for representing text and engineering useful features for analysis. The course introduces key analytical methods such as text classification, document clustering, and topic modeling, while gradually moving from traditional machine learning approaches to modern deep learning methods used in text analytics. Further, the course covers advanced topics including deep learning for text processing, information extraction, and text summarization. Students will also explore practical applications of text analytics in various domains such as social media analysis, business intelligence, and decision support systems. The course highlights the importance of multilingual text analytics, particularly in handling languages with diverse linguistic structures, preparing students to work with real-world text data across multiple languages.

BA3103 - Computational Social Science

This course introduces students to computational approaches used to analyze and understand social phenomena through data-driven methods. It explores how digital data sources, social networks, and computational models can be utilized to examine patterns of behavior, interaction, information diffusion, and influence within complex social systems. The course combines foundational concepts from social science with analytical and computational techniques, enabling students to translate social theories into formal models that can be simulated and analyzed. Key topics include social network analysis, agent-based modeling, and selected machine learning applications relevant to the study of social data. Through practical exercises and project-based learning, students gain hands-on experience in analyzing social network structures, developing simplified agent-based simulations, and interpreting model outcomes to understand emergent social dynamics. The course also emphasizes critical evaluation of computational approaches, including their assumptions, methodological limitations, and ethical considerations when studying human behavior and social systems. By integrating theoretical knowledge with practical analytical skills, the course prepares students to apply computational methods to investigate contemporary social challenges and to critically assess the insights generated through computational models and social data analysis.

BA3104 - Individual Project (Teach Research Methods)

The Individual Project is a capstone module that enables students to undertake substantial research projects within the field of Business Analytics. The module provides students with the opportunity to integrate the theoretical knowledge, analytical methods, and technical skills developed throughout the degree program to address a research problem. Students may focus on practical applications such as predictive analytics, machine learning, data mining, artificial intelligence, natural language processing, data visualization, and data analytics, or explore theoretical or methodological advancements within these domains. As part of the module, key research methods and research design approaches relevant to Business Analytics will also be introduced to support students in conducting their projects effectively. Under the guidance of an academic supervisor, students are required to define a clear problem statement, establish project objectives, and design an appropriate research methodology. The project typically involves activities such as data collection, data preparation, model development, and evaluation of analytical results. Students are also expected to critically reflect on the assumptions, limitations, ethical considerations, and practical implications of their work. The module culminates in the production of a comprehensive written report and a formal presentation demonstrating the project outcomes and their relevance for data-driven decision-making.

BA3105 - Business Communication for Analysts

This course is designed to develop communication and stakeholder engagement skills required for analytics professionals. The course focuses on presenting analytical insights clearly to both technical and non-technical audiences and translating complex data analysis into actionable business recommendations. Students learn techniques for writing analytical reports, delivering effective presentations, and applying data storytelling approaches to communicate insights. The course also emphasizes stakeholder engagement, professional communication, and collaboration in analytics projects. Through practical exercises and presentation activities, students develop the ability to communicate data-driven insights that support effective organizational decision-making.

SEMESTER 04

Code	Title	Credits	Compulsory / Optional
BA4101	Big Data Analytics	3	C
BA4102	Analytics for Process Improvement	2	C
BA4103	Legal Aspects of Business Analytics	2	C
BA4104	Independent Studies in Business Analytics	5	O

BA4101 - Big Data Analytics

This course aims to equip students with the concepts, architectures, and practical skills required to analyze large-scale, high-velocity, and high-variety data in modern business environments. It introduces big data characteristics, platforms, and analytics paradigms, and emphasizes the use of contemporary big data analytics tools to derive actionable insights for business decision-making. The course focuses on applying big data technologies and analytics workflows rather than low-level system development, enabling students to understand when and how big data approaches add value beyond traditional analytics.

BA4102 - Analytics for Process Improvement

This course introduces students to the use of process analytics and process mining techniques to understand, evaluate, and improve organizational processes. Students will learn to analyze event data, discover and enrich process models, identify decision points and bottlenecks, and evaluate performance and compliance. The course covers social network and role-based analysis, comparative process evaluation, and the use of modern process mining tools. Through hands-on exercises and case studies, students gain practical skills to provide data-driven recommendations for process optimization in diverse domains such as healthcare, education, and business operations.

BA4103 - Legal Aspects of Business Analytics

This course provides an introduction to the legal principles and regulatory frameworks governing the use of business analytics in modern organizations. As data-driven decision-making becomes central to strategic and operational processes, understanding the legal implications of data collection, processing, storage, and analysis is essential. The course examines key areas such as data protection and privacy laws, intellectual property rights, contractual obligations, cybersecurity regulations, ethical use of data, and compliance requirements. It also explores emerging legal challenges related to artificial intelligence, automated decision-making, and cross-border data transfers. By the end of the course, participants will be equipped to identify legal risks, ensure regulatory compliance, and integrate legal considerations into business analytics practices

BA4104 - Independent Studies in Business Analytics

This module provides students with a structured independent learning experience designed to strengthen the integration and practical application of the knowledge and skills acquired throughout the Business Analytics degree program. Conducted over the semester, the module consists of a series of independent tasks that engage students in analyzing contemporary business, technological, and societal issues using data-driven approaches. Students explore real-world problems and emerging topics in business analytics by conducting activities such as literature reviews, analytical reports on current technologies, exploratory and predictive data analysis, and investigations of economic or social trends. Each task requires students to independently identify relevant datasets, perform data preparation and cleaning, and apply appropriate data analytics, data mining, machine learning, and visualization techniques to generate meaningful insights. Emphasis is placed on critical interpretation of analytical results, methodological rigor, and the development of evidence-based recommendations. Students document their work through structured reports that outline the problem context, analytical methodology, findings, and reflections. The module culminates in the submission of a comprehensive portfolio compiling all completed studies, demonstrating students' analytical competence, problem-solving capabilities, and readiness for professional practice in Business Analytics.

A student may undertake BA 3104 in the Third Semester or opt to undertake BA 4104 in the Fourth Semester. BA 3104 shall span into the Fourth Semester as well. A student shall take either BA 3104 or BA 4104.

The syllabus applicable to each course shall be prescribed by the school from time to time and as approved by the Academic Syndicate.

GRADING SYSTEM

The percentage score obtained in respect of each course of the degree programme shall be converted into a Grade according to the scheme given below:

Grades & their Respective Grade Point Values

Range of Marks	Grade	Grade Point Value (GPV)
90 – 100	A+	4.00
80 – 89	A	4.00
75 – 79	A-	3.75
70 – 74	B+	3.25
65 – 69	B	3.00
60 – 64	B-	2.75
55 – 59	C+	2.25
50 – 54	C	2.00
45 – 49	C-	1.75
40 – 44	D+	1.25
30 – 39	D	1.00
20 – 29	D-	0.75
0 – 19	E	0.00
0	NC	0.00

NC –Not Completed

Computation of Grade Point Average (GPA)

$$GPA = \frac{\sum (GPV_i \times Credit_i)}{\sum Credit_i}$$

Where: GPV_i is the Grade Point Value for each course (on a scale from 0 to 4.00).
$Credit_i$ is the number of credit hours associated with each course.
$\sum$ denotes the sum over all the courses in the degree program entitled to the student.

ACADEMIC EXCELLENCE AWARDS

Students of each programme are entitled to the following convocation awards based on their academic excellence.

Graduation Awards (Awarded at the Convocation

- Prof. G.N. Wikramanayake memorial award for the best performance in Master of Business Analytics

REPEATING A COURSE/ SUBJECT

- A student who obtains less than C grade after the evaluation of any course will be allowed to re-sit for the evaluation of that course provided that the course is offered. The higher mark of the reappearances will be taken into consideration.

EXIT POINTS FROM THE DEGREE PROGRAMME

A student is able to make use of the following qualifications, to exit from the degree programme.

- Postgraduate Diploma

In order to obtain the Postgraduate Diploma qualification, the student should fulfil the following academic requirements.

- he/she has obtained a C grade (GPV of 2.00) for the Courses which add up or exceed 25 Credits;
- he/she has obtained a minimum of 2.00 of GPA ;
- such student has not qualified to be awarded the Master's Degree; and
- such student has made a written request for the award of the Diploma.

MINIMUM REQUIREMENT TO OBTAIN A DEGREE

A Student who has satisfied the following conditions will qualify to obtain the corresponding masters degree.

- he/she has obtained not lower than C grade (GPV of 2.00) in the Courses which make up a minimum of 30 Credits;
- he/she has obtained not less than a GPA of 2.00 for all the Courses which make up a minimum of 45 Credits; and
- he/she has obtained not less than a C Grade (Pass) for the Independent Studies in Business Analytics/ Individual Project.

3.5

Master of Cybersecurity

MASTER OF CYBERSECURITY

Master of Cybersecurity is a distance International Master Program in Cybersecurity launched in 2018 in collaboration with Asi@Connect TEIN Cooperation Centre and European Commission. The programme covers a broad spectrum of subjects in Network Security and Cybercrime Investigation. Main objective of the programme is to produce graduates who are competent in Cybersecurity related theory and practice with working knowledge to protect IT infrastructures in their organizations. The programme administers online (distance learning) and the students are required to be present at the UCSC for hands-on practical sessions and for the semester examinations.

DURATION

Two years part-time course of four semesters (15 weeks per semester).

LECTURES

Lectures and practicals will be conducted according to the time table.

ENTRY QUALIFICATIONS

a) A Bachelor's Degree from a University or Institution recognized by the University Grants Commission and/or the University of Colombo **Or**

b) Any other academic or professional qualification deemed equivalent to a Bachelors Degree by the Senate of the University of Colombo

ADMISSION

The selection process consists of either a written test or an interview.

CREDIT REQUIREMENTS

Course/Subject Description	Credit Value	Direct Staff-Student Contact Hours	Notional Hours (direct staff-student contact hours and independent learning)
Lecture course	1	15	50
Laboratory course	1	30	50
Individual project/ Independent Study	5	variable	500

One credit is considered equivalent to 50 notional learning hours for a taught course and laboratory course. In the case of project work/ Independent Studies, one credit is considered equivalent to a minimum of 100 notional hours.

PROGRAMME STRUCTURE

The programme has a number of courses and each course will carry a specified number of credits. Module descriptors for each course are available on VLE.

All four semesters consist of compulsory courses. Each student shall submit assignments as part of continuous assessment set by the school.

SEMESTER 01

Code	Title	Credits	Compulsory / Optional
MC1001	Principles of Cybersecurity	3	C
MC1002	Cryptographic Systems	3	C
MC1003	Network protocols and standards	2	C
MC1004	Network Design	3	C
MC1005	Special Themes in Cybersecurity*	2	C

MC1001 - Principles of Cybersecurity

Introduction to computer security, threat and its definition based on the different domains. Real world examples of security failures and their consequences.

Basics in software security and vulnerability. Basics in cryptography, PKI infrastructure,Basics in Web Security. Common web vulnerabilities. Web UI attacks and web tracking. Introduction to network security and Network level attack. Access control, OS security. The human aspect of the security triad. Social Engineering. Privacy in the digital age. Cybersecurity Management Concepts. The Future of Cyber Security.

MC1002 - Cryptographic Systems

Cryptographic Overview: Cryptographic Systems Overview, Mathematical Background for Cryptographic Systems, Diffie-Hellman Key Exchange, Public Key, Block Ciphers, Hash Functions, Random Numbers,Elliptic Curve Cryptography. Cryptography Protocols: Zero-Knowledge Proofs, E-Voting, Two-party Secure Computation, Multiparty Secure Computation, Chosen-Ciphertext Security, Homomorphic Encryption, Quantum Cryptography.

MC1003 - Network protocols and standards

Network Fundamentals. Network Interface Layer. Internet Layer (Network). Transport Layer. Switching and Routing protocol Fundamentals. IP Multicast Protocols and Fundamentals.Application layer protocols. QoS and Bandwidth control. Wireless protocols. Mobile communication protocols.

MC1004 - Network Design

Introduction to Network life cycle, Design Fundamentals, Failure modeling, Business Driven Design, Centralization Versus Decentralization. Networking models & Network Architectures. Network Modularity and Hierarchical Design Patterns. Robustness basics of Network Design. Common Network Topologies and Tree Structures. Considering Complexity on Network Designing. Design Considerations of Advanced Network Technologies and Services. Securing the Network. VLAN design, security aspects of VLANs. DNS. Threat modeling in a network point of view. Performance modeling. Data Center Design. Software-Defined Networks.

MC1005 - Special Themes in Cybersecurity*

Onion routing, Tor. Bitcoin ecosystem. The criminal ecosystem surrounding bitcoin and blockchain. Use case studies: Silk Road, Bangladeshi central bank heist, Human Trafficking and Bitcoin, Stuxnet. Edward Snowden - whistleblowing in the age of Big Brother. Social Networks and Democracy. Security in Medical equipment.

* This course will continue in the second semester.

SEMESTER 02

Code	Title	Credits	Compulsory / Optional
MC2001	Database Security	3	C
MC2002	Software Vulnerability Analysis	3	C
MC2003	Network Security	3	C
MC2004	Security in Mobile and Wireless Networks	3	C

MC2001 - Database Security

Introduction to Database Security. Database View. Database Authentication. Discretionary Access Control. Role Based Access Control. Mandatory Access Control. Mandatory Access Control - Label Security. Security threats with respect to SQL injections. Virtual Private Database (VPD). Database Inference. Database Inference - Tracker Method. Statistical Database, Database Auditing - Standard Auditing. Database Auditing - Fine-Grained Auditing. Encryption mechanisms in Databases.

MC2002 - Software Vulnerability Analysis

Malicious codes. OWASP Top ten vulnerabilities. Vulnerability scanning. Secure Software Development - Introduction. Build Security In and SSE Methodologies. Threat Modelling. Software Security Touchpoints. Code Quality and Security Analysis. Threat Analysis. Secure Software Engineering -Capability Maturity Model. Threat Modelling with Threat Modelling Tool I and II. Secure Infrastructure for Secure Software I and II.

MC2003 - Network Security

Network interface layer security. Security considerations in routing protocols. Transport layer: Enumeration (port scanning and sniffing), attack surface analysis and tools. Network authentication and protocols. Application layer security: Remote connectivity, Secure communication, Web security, Web security - Vulnerability assessment and penetration testing and tools, Email security. Security Operations Centre. Cloud computing, Software Defined Networks and security. Defining a trust base. Endpoint security: Data Leakage Prevention, Host-based Intrusion Detection Systems.

MC2004 - Security in Mobile and Wireless Networks

Evolution of Standards and Mobile Networks. Wireless network planning and design: Infrastructure and ad-hoc, Physical layout and security concerns. Security in WiFi networks:WEP, WPA, WPA2, WPS, 802.1x. Bluetooth Security. NFC security. IoT and wearable. GSM Security. LTE security. Mobile applications and security considerations. Android Cryptography.

SEMESTER 03

Code	Title	Credits	Compulsory / Optional
MC3001	Digital Forensic	3	C
MC3002	Cybercrime and Legal Regime	2	C
MC3003	Open Source intelligence	3	C
MC3004	Incident Response Management	2	C
MC3005	Technical Writing		C

MC3001 - Digital Forensic

Introduction to Digital Forensics and Investigative Process. Essential Skills - Forensic Documentation, Data Interpretation, Tools of the Trade. File System Forensics : Disk Image Acquisition, Disk Image Manual Interpretation, Disk Image Analysis with Tools. Windows Forensics Basics and Analysis. Mobile Forensics. Memory Forensics. Internet Forensics. Email and Instant Messaging Forensics. Emerging Trends in Digital Forensics.

MC3002 - Cybercrime and Legal Regime

General Criminal Law Concepts. Common criminal Laws used in cyberspace. Types of jurisdiction and Issues of the jurisdiction in cyberspace. Digital Evidence and seizures of Digital Evidence. The Nature of Digital Searches and Warrants for Digital Evidence. Electronic signatures law, Dispute resolution on the Internet. Cyber Stalking/Harassment. Cyber Pornography. Cyber Terrorism and Cyber Defamation. Intellectual Property laws and Issues in Cyberspace.

MC3003 - Open Source intelligence

Understanding Open Source Intelligence (OSINT) objectives and techniques as an intelligence gathering discipline. Operational security, staying anonymous on the Internet. Software tools and online services are used for gathering, processing, and analysis of raw data. Evaluating and classifying data retrieved through OSINT gathering techniques. Image and photo tracking, tracing, and analysis.Locating and verifying social media profiles and identities. Acquiring data from protected social media accounts. Cryptocurrency transactions and blockchain analysis. The Dark Web. Counterintelligence techniques used by the criminal elements.

MC3004 - Incident Response Management

Types of Computer Security Incidents. Responding to various types of malicious activity such as the use of rootkits. Botnets and distributed denial of service attacks. Malware Persistence Detection. Insider Threats: Responding to insider threats, Cyber threat intelligence, Threat hunting. Handling major computer security events and incidents. Incident management principles and concepts. Scope and charter of incident management. Incident management objectives. Incident management metrics and indicators. Defining incident management procedures. Incident management resources. Incident response capability. Elements of an incident response plan. Real incident response strategies and methods. Remote and enterprise incident response. Evidence collection. Developing response and recovery plans. Testing response and recovery plans. Executing response and recovery plans. Documenting events Post incident reviews. Legal aspects of Incident Management.

MC3005 - Technical Writing

Encounters with technical communication Everyday. Technical communication in practice. Ethics in technical communication. Document design and content. Graphics: power, color, content, ethics. Preparing technical report. Preparing research report. Preparing oral presentations. Preparing project proposal. Create Brochure.

SEMESTER 04

Code	Title	Credits	Compulsory / Optional
MC4001	Information Security Audit	2	C
MC4002	Network Troubleshooting	3	C
MC4003	Independent Studies in Cybersecurity	5	C

MC4001 - Information Security Audit

The cycle of threats, vulnerabilities, risks, and counter-measures. Information Security Models. Information Security Risk. Risk management. Quantitative risk management. Information Security Management. Information Security Program. Information Security Policies. Information Classification – Criteria – Owner – Custodian – User. Privacy principles. Authentication, Authorisation, and Accounting. Security Controls. Information Security Auditing. Security Auditing and Reporting. Computer Ethics.

MC4002 - Network Troubleshooting

Introduction to Network Troubleshooting and Harding by Network Planes:Data Plane, Control Plane, Management Plane. Structured Troubleshooting Approaches. Integrating Troubleshooting into the Network. Maintenance Process and Hardening. Network Troubleshooting Tools. Troubleshooting Network Hardware Issues and Failure Domains. Troubleshooting and Hardening of Network System Components. Troubleshooting and Hardening Layer 2 Forwarding/Switching. Network Link Failures and Troubleshooting. Troubleshooting and Hardening Layer 3 Forwarding/Routing. Troubleshooting IP Services. Troubleshooting and Hardening Basics of Routing Protocols, Distance Vector, Link State, Hybrid. IP Multicast Troubleshooting, Security and Hardening.

MC4003 - Independent Studies in Cybersecurity

Study 01 - Digital Forensic - File Systems

Study 02 - Digital Forensic - Memory Analysis

Study 03 - Web Vulnerabilities - Analysis

Study 04 - Web Vulnerabilities - Attacks

Study 05 - Building a Secure E-Commerce Portal Using CMS

Study 06 - Software Defined Radio (SDR) for Wireless Security

Study 07 - Android Security

Study 08 - Web Application Penetration Testing

Study 09 - Bitcoin

Study 10 - Capture the flags

The syllabus applicable to each course shall be prescribed by the school from time to time and as approved by the Academic Syndicate.

GRADING SYSTEM

The percentage score obtained in respect of each course of the degree programme shall be converted into a Grade according to the scheme given below:

Grades & their Respective Grade Point Values

Range of Marks	Grade	Grade Point Value (GPV)
90 – 100	A+	4.25
80 – 89	A	4.00
75 – 79	A-	3.75
70 – 74	B+	3.25
65 – 69	B	3.00
60 – 64	B-	2.75
55 – 59	C+	2.25
50 – 54	C	2.00
45 – 49	C-	1.75
40 – 44	D+	1.25
30 – 39	D	1.00
20 – 29	D-	0.75
0 – 19	E	0.00
0	NC	0.00

NC –Not Completed

Computation of Grade Point Average (GPA)

Computation of GPA is performed based on the formula given below.

$$\left[\frac{\sum \text{GPV of compulsory course} * \text{credit value of compulsory course} + \sum \text{GPV of optional course} * \text{Credit value of optional course}}{\sum \text{credit value}} \right]$$

DISTINCTION

- A student who has qualified for the award of the Degree by completing all the relevant requirements may be awarded Distinction if he/she has obtained GPA of not less than 3.50, provided he/she had completed the degree at the first attempt.

ACADEMIC EXCELLENCE AWARDS

Students of each programme are entitled to the following convocation awards based on their academic excellence.

Graduation Awards (Awarded at the Convocation

- Award for the best performance in Master of Cybersecurity

REPEATING A COURSE/ SUBJECT

- A student who obtains less than C grade after the evaluation of any course will be allowed to re-sit for the evaluation of that course provided that the course is offered. The higher mark of the reappearances will be taken into consideration.

EXIT POINTS FROM THE DEGREE PROGRAMME

A student is able to make use of the following qualifications, to exit from the degree programme.

- Postgraduate Diploma

In order to obtain the Postgraduate Diploma qualification, the student should fulfil the following academic requirements.

- he/she has obtained a GPV of not less than 2.00 for Courses which add up or exceed 25 credits;
- he/she has obtained a minimum of 2.00 of GPA;

MINIMUM REQUIREMENT TO OBTAIN A DEGREE

A Student who has satisfied the following conditions will qualify to obtain the corresponding masters degree.

- not less than a GPV of 2.00 in the Courses which make up a minimum of 35 Credits;
- not less than a GPA of 2.00 for all the Courses which make up a minimum of 45 Credits; and
- not less than a C Grade (Pass) for the Independent Study.

04

General Guidelines

PROGRAMME ADMINISTRATION



Head Postgraduate Programmes

Prof. T N K De Zoysa
B.Sc. (Col), Ph.D. (Stockholm), MIEEE

MASTER OF COMPUTER SCIENCE/ MASTER OF SCIENCE IN COMPUTER SCIENCE



Programme Coordinator

Dr. A P Sayakkara
B.Sc. (Hons), PhD (UCD, Dublin), (Colombo), SMIEEE



Project Coordinator: MCS and MSc in CS

Dr. K A K T Karunanayake
BSc (Hons)(Mora), Ph.D. (NUS)

MASTER OF INFORMATION TECHNOLOGY



Programme Coordinator

Dr. H E M H B Ekanayake
B.Sc. (Col), M.Phil. (Col), Ph.D. (Stockholm University, Sweden)



Independent Study Coordinator

Dr. (Ms.) M W A C R Wijesinghe
B.Sc. (Pdn), PG Dip (Col), M.Sc. (Col), M.Phil. (Col), PhD (Col)

MASTER OF INFORMATION SECURITY



Programme Coordinator

Mr. P K M Thilakarathne
BIT (Col), MPhil (Col)



Project Coordinator

Dr. T N B Wijethilake
BIT, MSc in Computer Science, PhD, MBCS, MCS(SL)

MASTER OF BUSINESS ANALYTICS



Programme Coordinator

Dr. R A Y S Ranasinghe
B.Sc. (Hons)(RJT), Ph.D.(Monash), CTHE-SEDA (UK), MIEEE



Project Coordinator

Mr. R J Amaraweera
B.Sc. (Hons)(Col), Mphil (Col), SEDA(UK), CTHE(Col)

MASTER OF CYBERSECURITY



Programme Coordinator

Dr. R N Rajapakse
B.Sc. (Hons)(Col), Ph.D.(Adelaide), CAPM, MIEEE, CTHE-SEDA (UK)



Project Coordinator

Dr. T N B Wijethilake
BIT, MSc in Computer Science, PhD, MBCS, MCS(SL)

POSTGRADUATE DIVISION
(E105 UCSC BUILDING)



Senior Assistant Registrar

Ms. E M S S K Ekanayake
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Staff Management Assistant

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Management Assistant (On Contract)

Mr. H A L Maduka
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Management Assistant (On Contract)

Ms. S P G Y Sandagiri
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Trainee

Mr. S H N Priyamal
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Works Aide

Ms. M G D N S Kumari
Email: mgd@ucsc.cmb.ac.lk

EXAMINATIONS DIVISION
(W107, UCSC BUILDING)



Deputy Registrar

Ms. J A M Wijerathna
BIT(HDip), B.Sc(USJP), MPA (Col)
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Staff Management Assistant

Mr. R Prasanna
Email: rpr@ucsc.cmb.ac.lk

SERVICES OF POSTGRADUATE DIVISION

Postgraduate Division of the UCSC is the administrative office for postgraduate programmes studies at UCSC.

The division supports the students on matters related to the new admissions, renewal of registrations, ID cards, certification letters, student appeals, learning system (PGVLE) access and other student services provided by the UCSC.

Email	msc@ucsc.cmb.ac.lk
Tel	11- 2581245/ 7 Ext. 8994
Address	Postgraduate Division, UCSC, No. 35, Reid Avenue, Colombo 07, Sri Lanka.

Registration Process

Successful candidates in the selection process shall register for the programme by paying applicable course fees. For more information, please visit: *https://ucsc.cmb.ac.lk/academic-programmes/postgraduate-programmes/*

Note: Students are required to pay full payment at the registration. payment plan is also introduced for the needy students.

The division maintains a personal file with the following information of each registered student.

- Certified copy of Birth certificate
- Certified copy of National identity card/ Passport
- Certified copy of Degree certificate(s)
- Certified copy of Academic transcript(s)
- Certificates of other educational/ professional qualifications
- Service letters from the previous and current employers
- Payment receipt for initial registration in the programme

Upon registration, the students will be provided with the following facilities

- Access to Postgraduate Learning Management System (PGVLE) which provides access to course materials, past papers, quizzes, assignments, discussion forums, etc.
- Access to UCSC Library facility
- WiFi access
- A Student ID Card
- A Student Handbook

At the commencement of academic activities of each semester, the postgraduate division performs the following tasks;

- Organizing the inauguration ceremony and the Orientation Programme for the new intake
- Preparation and publishing of the Academic Calendar in the PGVLE
- Obtaining the approval from the Senate for the course Rubric and Examiners of the courses of each degree programme.
- Creating the LMS Instance for the courses of each programme in consultation with the E-learning Centre, UCSC.
- Updating the VLE regularly in consultation with the e-Learning Centre (i.e. weekly time table, academic calendars, special notices etc.)
- Reserving and arranging Lecture Halls /Labs for lectures in consultation with Academic & Publication Division and Network Operating Centre
- Preparation and publishing of weekly lecture timetable in the VLE in consultation with the examiners and programme coordinators
- Preparation, distribution and collection of weekly Attendance Sheets.
- Preparation and publishing the semester end exam timetable in consultation with Examination Division
- Facilitating the Examination Division to conduct the semester examinations.
- Facilitating student in submitting assignments/project reports
- Facilitating students in forwarding their requests/queries/appeals related to academic activities at the Board of Study/Research and Higher Degrees with the recommendation of relevant Programme/ Project Coordinators.
- Informing the decisions made at the BOS/RHD, Academic Syndicate, to the relevant students.
- Facilitating Project Coordinators to evaluate master's Dissertations by:
    - Collecting monthly progress reports
    - Collecting and distributing interim reports.
    - Collecting and distributing final project reports.
    - Conducting final Viva
- Issuing studentship certification letters requested by students
- Facilitating students to select optional courses of semester III and IV of MCS/ MSc in CS/ MIT/ MBAnalytics Degree Programmes using the prescribed forms
- Collecting student feedback at the end of each semester in consultation with the Quality Assurance Cell with the aim of improving the future delivery of the course based on suggestions/feedback
- Facilitating foreign students for VISA arrangements
- Canducting pear review of lecturers in each semester

Repeat students

The postgraduate division facilitates the repeat students to complete the degree within the maximum period of 04 years from his/ her initial registration to the programme by:

- Registering in the relevant academic year upon the payment of the prescribed fees (fees given below are subject to change as per the approved budget of each academic year)

Student Requests

The division facilitates the students to submit their requests/queries/appeals related to academic activities of the programme to the Board of Study/Research and Higher Degrees (BOS/RHD) with the recommendation of relevant Programme/ Dissertation Coordinators.

The students who have been absent at the semester examinations are eligible to retake the examination in the next available opportunity of the subject after paying the prescribed fees within the maximum period of validity (four academic years including the first period of registration) of the degree.

If a student resists examination for a course, the highest marks scored for such courses will be taken into consideration in the computation of GPA for the award of the Degree.

In mitigating conditions the student should submit an appeal with documentary evidence for his/her absence at the examination to the BOS/RHD within 07 working days from the examination date. It is not essential to submit an appeal for absence for an examination unless the student wishes that he/she be considered for the Distinction as per the Bylaws Section 14 (2).

The BOS/RHD shall normally consider the requests under the following two categories;

1. Under Exceptional Circumstances (EC)*:
    - Grants within the registered period of validity (04 years)
    - Considered only under medical conditions of the immediate family or similar personal circumstance with documentary evidence acceptable to the BOS/RHD
    - Recommendation from the relevant coordinator

2. Under Grace Chance:
    - Grace Chance is granted to complete the degree beyond the maximum period of validity (i.e. 04 years) subject to acceptable documentary evidence and recommendation of the relevant Programme Coordinator and the Senior Assistant Registrar/Examination on the possibility of completing the degree in the given grace period.
    - A maximum of one year grace period will be granted.
    - Grades obtained within the grace period are not considered for Merit or Distinction Passes.*
    - Grades of the deferred years will be marked as “absent” in the transcript.

***Note**: Only applicable to Master of Information Security, Master of Business Analytics and Master of Cybersecurity

05

Our Team

OFFICIALS

DIRECTOR



Dr. D A S Atukorale
B.Sc. (Col), PhD (Queensland), MIEEE, MCSSL

DEPUTY DIRECTOR



Prof. T N K De Zoysa
B.Sc. (Col), Ph.D. (Stockholm), MIEEE

HEADS OF DEPARTMENTS

Department of Communication and Media Technologies



Prof. T N K De Zoysa
B.Sc. (Col), Ph.D. (Stockholm), MIEEE

Department of Computation and Intelligent Systems



Mr. W V Welgama
B.Sc. (Col), M.Phil. (Col)

Department of Information Systems Engineering



Dr. C I Keppitiyagama
B.Sc. (Col), M.Sc. (British Columbia, Canada), Ph.D. (British Columbia, Canada), MIEEE

ACADEMIC STAFF

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Research Interests:
Human Computer Interaction, Software Engineering, e-Learning, ICT for Development

PROFESSORS



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Research Interests:
Multimedia Information Management, Intelligent Web Interaction, Web Information Management and Retrieval, Web Search Optimization, Audio Music Monitoring

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Research Interests:
GIS Web Services, Semantic Web, Location Based Services, Ontology Engineering

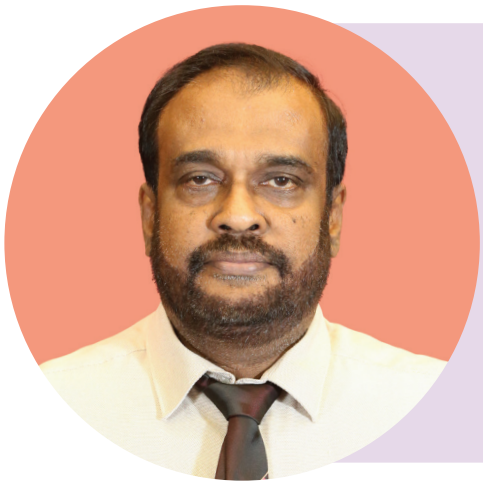




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Research Interests:
Computer Graphics, Assistive Technology, Virtual Environments, Code Analytics, Unmanned Aerial Vehicles



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Data Mining, Machine Learning, ICT Education, Algorithms, MIS, ICT and Society, e-government, Blended Learning



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Research Interests:
High Performance Computing

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e-Learning, Instructional Design, Multimedia Technologies, Information Systems, ICT4D





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Machine Learning, Data Mining, Image Processing, Graphics and Visualization, Music Information Retrieval





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Research Interests:
Technology-Enhanced Assessment, e-Learning, Learning Analytics, Educational Technology, Human Computer Interaction, Game-based Learning, Gamification, and Geographic Information Systems

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ICT for Development, eBusiness, eTransformation, eHealth, ICT for Economic/Social Development, IT Strategic Planning, Music and IT, IT for Ethnic Harmony, Aesthetic studies for IT





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Information Security and Audit, Information Privacy

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Research Interests:
ICT4D, Social Life Networks, Software Engineering





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Machine Learning, Cyber Security, Digital Forensics



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Research Interests:
Natural Language Processing, Human Language Technology, Speech Processing



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Research Interests:
Natural Language Processing/Human Language Technology - Machine Translation, Statistical and Corpus Based Methods, Speech Processing and Machine Learning



Dr. S S P Mathara Arachchi
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Research Interests:
Enterprise Resource Planning, Internet Application Development, Web Accessibility, Information Management, Software Quality Assurance, eLearning, e-Governance, E-Business, Business Rule Writing, and Business Process Reengineering, Health Informatics, Data Analytics.



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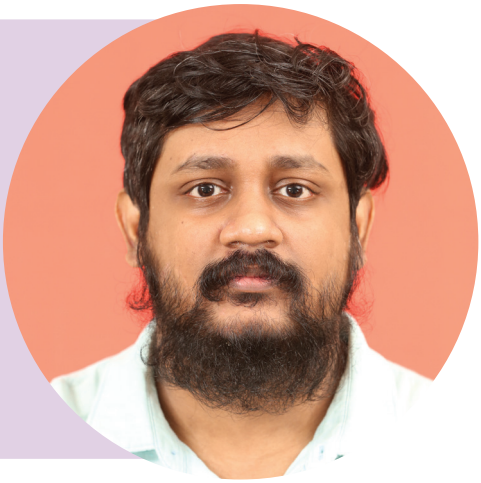


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