# UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING



# 2020

## UNDERGRADUATE

# HANDBOOK

No: 35, Reid Avenue, Colombo 07 +94 11 258 1245 info@ucsc.cmb.ac.lk www.ucsc.cmb.ac.lk




## University of Colombo School of Computing

# UNDERGRADUATE STUDENT HANDBOOK 2020

University of Colombo School of Computing
No 35, Reid Avenue
Colombo 00700
Sri Lanka
Telephone +94-11-2581245
Fax +94-11-2587239
Email: info@ucsc.cmb.ac.lk
Web Site: http://www.ucsc.cmb.ac.lk

## Disclaimer

*This handbook is compiled with information received up to December 2019, and is applicable to the students of Academic Year 2018/2019*
*[Based on the G.C.E. (A/L) Examination 2018]*

*It is hereby informed that this handbook is only for general information and is not for official purposes.*

*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/ug*



## Vision

Be a global leader in Computing,
advancing the frontiers of new knowledge through
learning and research.

## Mission

To advance and enhance computing knowledge,
fostering global strategic alliances,
promoting cross disciplinary research,
producing socially responsible professionals with
entrepreneurial skills, leadership qualities and integrity
contributing to position the country as a
knowledge hub in the region.



# MESSAGE FROM THE VICE CHANCELLOR

I am pleased to issue a message of welcome on the occasion of publishing the Student Handbook 2020 compiled by the University of Colombo School of Computing (UCSC). I believe that this handbook with all essential information, will be immensely beneficial for the new entrants to the UCSC.

The Institute of Computer Technology (ICT), the predecessor of the present UCSC was established in the year 1987. With the subsequent developments taking place in the area of information and communication technologies, the need of a fully fledged higher educational institute facilitating IT and communication related subjects were seriously contemplated by the Policy makers of the University. Consequently, the University of Colombo School of Computing was established in 2002 under the guidance of the late Professor V K Samaranayake. It is with immense gratitude I remember Professor V K Samaranayake, without whose services and dedicated contribution neither the ICT nor the UCSC would have become a reality. I am happy to note that the UCSC at present has become a much sought after institution for IT education in Sri Lanka. I would also like to note with pleasure that, under the excellent guidance of the current Director Professor K P Hewagamage, the academic staff of the UCSC is well-trained with many of them having earned their doctoral degree from highly recognized universities, fellowships and memberships from world renowned professional associations.

I am certain that this handbook will provide the new entrants with useful information about the place of learning they are about to enter. A handbook is of use not only to the students but to those who wish to have an in-depth knowledge of the activities of the institute, including the operational mechanism of both academic and administrative spheres. I would like to extend my gratitude to the Handbook Committee of the UCSC for embarking upon a very useful and constructive exercise.

As students of the University of Colombo, I hope that you will gain maximum benefits from the valuable opportunities bestowed upon you and be competent professionals and responsible citizens in future.

Finally, I extend my warm wishes to you all and hope you have an exciting, rewarding, challenging and stimulating period at the University of Colombo.

*Senior Professor Chandrika N Wijeyaratne*
Vice Chancellor of the University of Colombo



# MESSAGE FROM THE DIRECTOR

I am honoured to welcome all new undergraduates to the University of Colombo School of Computing on behalf of our staff and the students. Simultaneously I would like to congratulate all of them for being fortunate to get the admissions for the best higher education centre in Computing in Sri Lanka. Since the beginning in 2002, the University of Colombo School of Computing has been holding the number one position in Sri Lanka by having the most advanced training resources and experience in information and communication technology.

You have entered a new era of higher education and it will be totally different from your school education. In the university education, the role of teaching is just to facilitate the learning. Thus UCSC is dedicated to a student centered education which encourages the academic excellence through well defined and gradually updated syllabi. Moreover, we have well qualified academic staff to support all of you, by any means necessary to ensure that the students reach their fullest academic potentials. In that manner, since the beginning, UCSC has been gradually moving towards success by following the vision of the UCSC "be a global leader in computing, advancing the frontiers of new knowledge through learning and research". Simultaneously, UCSC has been doing a great service to the country by fulfilling the increasing demand for IT professionals. In 1985, UCSC introduced computer science as a field of specialization and has produced a significant number of graduates for the IT industry in Sri Lanka.

Another significant fact is that you have to keep in your mind is the importance of English for the successful completion of the degree. Since all the courses are conducted in English, you may have to face certain challenges during the period of your university education. Therefore, it is essential to work hard to overcome these barriers. Although it is considered a barrier, with the

English learning background the students will be able to enhance their English language proficiency at the end of the course.

Apart from the best ICT education, life at the University of Colombo School of Computing is also enriched with resources for extracurricular activities. Thus the students will be able to balance the extracurricular activities with their studies. Therefore, as students you must be able to get the best out of them during your academic years in the university. Within your study period, you will be able to experience a range of events organized by the students throughout the year. With your entrance to the second year you will get the opportunity to organize those events and which will improve your innovative and social skills and will also affect on your personal development. In your life you may never again be able to do certain things that you are going to do here with the same amount of expert advice and inspiring social background. Therefore, please take the fullest benefits of these opportunities.

The beginning of everything is hard. You might face problems trying to adjust to the new environment. At the same time you may face unpleasant physical, mental and financial difficulties. But try to be strong and go towards your target. I assure you that our staff is always be available for you and you can freely discuss your problems with them. They will be happy to help you and guide you throughout your stay at UCSC. Therefore, we expect you to maintain a good relationship with the academic advisors, counselors and the mentors.

Finally, I would like to remind all of you that as the best higher education center in IT in Sri Lanka, we are dedicated in your education and skill development since we regard that the future and the development of our country depends on you. Providing best professionals, well developed syllabi or the best courses cannot make you an outstanding graduate unless you take the responsibility on your own and become active learners and follow your studies properly and independently. Thus, I hope that all of the new undergraduates will do their best and grow into locally and internationally renowned personalities with innovative and expert minds. Once again, I wish you all the best for the new journey that you are going to commence at the University of Colombo School of Computing.

*Professor K P Hewagamage*
Director of the University of Colombo School of Computing

# ACRONYMS

| | | |
|---|---|---|
| ACM | : | Association for Computing Machinery |
| ADMTC | : | Advanced Digital Media Technology Centre |
| BIT | : | Bachelor of Information Technology |
| CDF | : | Centre for Digital Forensics |
| CIS | : | Department of Computation and Intelligent Systems |
| CMO | : | Chief Medical Officer |
| CMT | : | Department of Communication and Media Technologies |
| CS | : | Computer Science |
| CSC | : | Computing Services Centre |
| CDF | : | Centre for Digital Forensics |
| EDC | : | External Degrees Centre |
| EEP | : | External and Extension Programmes |
| e-LC | : | E-Learning Centre |
| FIT | : | Foundation of Information Technology |
| GPA | : | Grade Point Average |
| GPV | : | Grade Point Value |
| ICTA | : | Information and Communication Technology Agency |
| IEEE | : | Institute of Electrical and Electronics Engineers |
| IS | : | Information Systems |
| ISE | : | Department of Information Systems Engineering |
| IUD | : | Internal Undergraduate Degrees |
| JICA | : | Japan International Cooperation Agency |
| LEARN | : | Lanka Education and Research Network |
| LTRL | : | Language Technology Research Laboratory |
| NOC | : | Network Operating Centre |
| PDC | : | Professional Development Centre |
| RHD | : | Research and Higher Degrees |
| SIDA | : | Swedish International Development Agency |
| SLN4D | : | Social Life Networks for Development |
| TEIN | : | Trans Eurasia Information Network |
| UCSC | : | University of Colombo School of Computing |
| UGC | : | University Grants Commission |
| UGVLE | : | Undergraduate Virtual Learning Environment |
| UMO | : | University Medical Officer |
| UOC | : | University of Colombo |

# TABLE OF CONTENTS


Vision & Mission ..... iii
Message from the Vice Chancellor ..... iv
Message from the Director ..... vi
Acronyms ..... viii
Introduction ..... 01
- The University of Colombo ..... 02
- The University of Colombo School of Computing (UCSC) ..... 03
- Goals of the UCSC ..... 05
- Structure of the UCSC ..... 06
- Key Officials of The University of Colombo ..... 11
- Key Officials of the UCSC ..... 13

Undergraduate Student Life ..... 21
- Location and Vicinity of the Campus ..... 22
- Undergraduate Student Enrolment ..... 23
- Student Index and Registration Number System and ID Card .. 25
- Scholarships ..... 25
- Hostel Facilities ..... 26
- Railway Season Tickets ..... 27
- Guidance and Counselling ..... 27
- UGVLE ..... 29
- Library ..... 29
- Laboratory Facilities ..... 30
- Obtaining Wi-Fi Connectivity ..... 31
- Server Facilities ..... 31
- Email Policy ..... 32
- Health Facilities ..... 32
- Physical Education & Sports ..... 32
- Student Societies ..... 33
- Canteen Facilities ..... 36
- Photocopy Facility ..... 36
- Marshal Office ..... 36

Undergraduate Degree Programmes ..... 37
Structure of Programmes ..... 38
Computer Science Degree Programme ..... 46
Information Systems Degree Programme ..... 71
Rules, Regulations and Ethics ..... 97
Ethics ..... 98
Rules and Regulations ..... 99
Other Activities at UCSC ..... 111
Postgraduate Studies ..... 112
External Studies ..... 112
Short-term Courses ..... 113
Research Groups ..... 114
Staff of the UCSC ..... 117
Senior Professors ..... 118
Professors ..... 118
Senior Lecturers ..... 119
Senior Lecturers (On Contract) ..... 126
Lecturers (Probationary) ..... 127
Lecturers (On Contract) ..... 131
Instructors ..... 131
Temporary Academic Staff ..... 131
Appendix A: Forms of Ragging ..... 132
Appendix B: Appreciation of Prof. V. K. Samaranayake ..... 134
Appendix C: Milestones ..... 137

# INTRODUCTION



# THE UNIVERSITY OF COLOMBO

The University of Colombo has a history over 80 years as a leading higher educational provider in Sri Lanka. The University of Ceylon was established by the state council on 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 as 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 nine faculties, one school (University of Colombo School of Computing), seven 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, specialized 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 SCHOOL OF COMPUTING (UCSC)

The University of Colombo School of Computing (UCSC) is an integral part of the University of Colombo and has a history of seventeen years as the leading higher education institute for Computing in Sri Lanka.

The Computer education at the University of Colombo was established way back in 1967 by the historic affiliation of the Statistical Unit of the Department of Mathematics. The Statistical Unit was enhanced as the Statistical Consultancy and Data Processing Service Centre (SCDSC) by the salient guidance and efforts of late Vidya Jyothi Professor V.K. Samaranayake, who pioneered Computing, IT development and usage in Sri Lanka and thus he is considered as the "Father of Information Technology" in Sri Lanka. He was a Professor of Computer Science and a former dean of the Faculty of Science, University of Colombo. Professor Samaranayake at the time of his demise was the chairman of the Information and Communication Technology Agency (ICTA) in Sri Lanka. An appreciation of his work is given in Appendix B of this book, as a display of gratitude for his great service.

By the dawn of 1985, Statistical Consultancy and Data Processing Service Centre (SCDSC) had emerged as the Department of Statistics and Computer Science (DSCS). The lead role of DSCS was to offer special degree programmes in both Statistics and Computer Science. DSCS launched the first postgraduate programme in computing offered by a Sri Lankan university in 1986 and later in 1990 initiated a special programme in computer science which subsequently produced a scant of forty graduates per batch which desperately insufficient to meet the increasing demand for professionals of various disciplines in the field of Computer Science.

A batch of fifty students was offered to study computer science directly, through the University Grants Commission in 1997. By this time since the aforesaid ineludible demand for professionals raised, it was considered the concerns over the expansion of computer science subdivision of DSCS to emerge as a separate entity to aid and formulate strategies and policies to meet such a growing demand. Consequently, in 2001, DSCS was reformed to function as two separate entities: Department of Computer Science (DCS) and Department of Statistics (DS).

Consolidating with the restrictive framework as a faculty, the Department of Computer Science identified the potential limitations of its operations

and concerned for the meticulous autonomy. Moreover, the faculty highly envisioned of having a strong industry relationship for exploiting the future growth potential. The Institute of Computer Technology (ICT) which was already conducting the Bachelor of Information Technology (BIT) and the Postgraduate Diploma in Computer Technology programmes had a strong relationship with industry and simultaneously was maintaining a high institutional profile among foreign donor agencies. The ICT was also enjoying a higher autonomy of their business operations than a typical faculty, making it effective to receive a large number of funds and resources from JICA, SIDA and other donors.

Considering the fact that the domain ICT was reigning and the golden opportunities which the institute already depicted, it became the right counterpart for the Department of Computer Science to achieve the goals; the latter envisioned for. Thus, the historic merger between the industry focused Institute of Computer Technology was occurred and the more theoretically oriented Department of Computer Science gave birth to University of Colombo School of Computing (UCSC) on the 01st of September, 2002.

The catalyst who helped in attaining this crucial merges is none other than the late Professor V. K. Samaranayake who also became the founding director of UCSC and whose proactive thinking and visionary leadership forged a conducive path to achieve success in every endeavour undertaken by the UCSC. Dr. A. R. Weerasinghe who succeeded Prof. Samaranayake as the director in 2004, was succeeded by Prof. G. Wikramanayaka in 2010. The present director of UCSC is Prof. K. P. Hewagamage.



Establishment of the University of Colombo School of Computing (UCSC) on 1st of September 2002. Chancellor Deshamanya Dr. P. R. Anthonis lighting the Traditional Oil Lamp.



Japanese Parliamentary delegation's visit to the UCSC in 2002. Also in the picture Vice Chancellor Prof. Tilak Hettiarachchi and Ambassador H. E. Seichiro Otsuka.

## GOALS OF THE UCSC

**GOAL 1**

To be a Centre of excellence in teaching and learning computing.

**GOAL 2**

To promote research and development in computing.

**GOAL 3**

To improve the qualities and responsibilities and professionalism of the students / staff.

**GOAL 4**

Enhancement of infrastructure facilities for higher productivity through development of physical resources and human capital.

**GOAL 5**

Enhancement the institutional image through good governance

**GOAL 6**

To contribute to the development of ICT in the society (Social Responsibility)

## STRUCTURE OF THE UCSC

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, four 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.

Following are the three academic departments based on the research interest.

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

### Centres of the UCSC

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

### Board of studies at the UCSC

| | |
|---|---|
| **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)** |

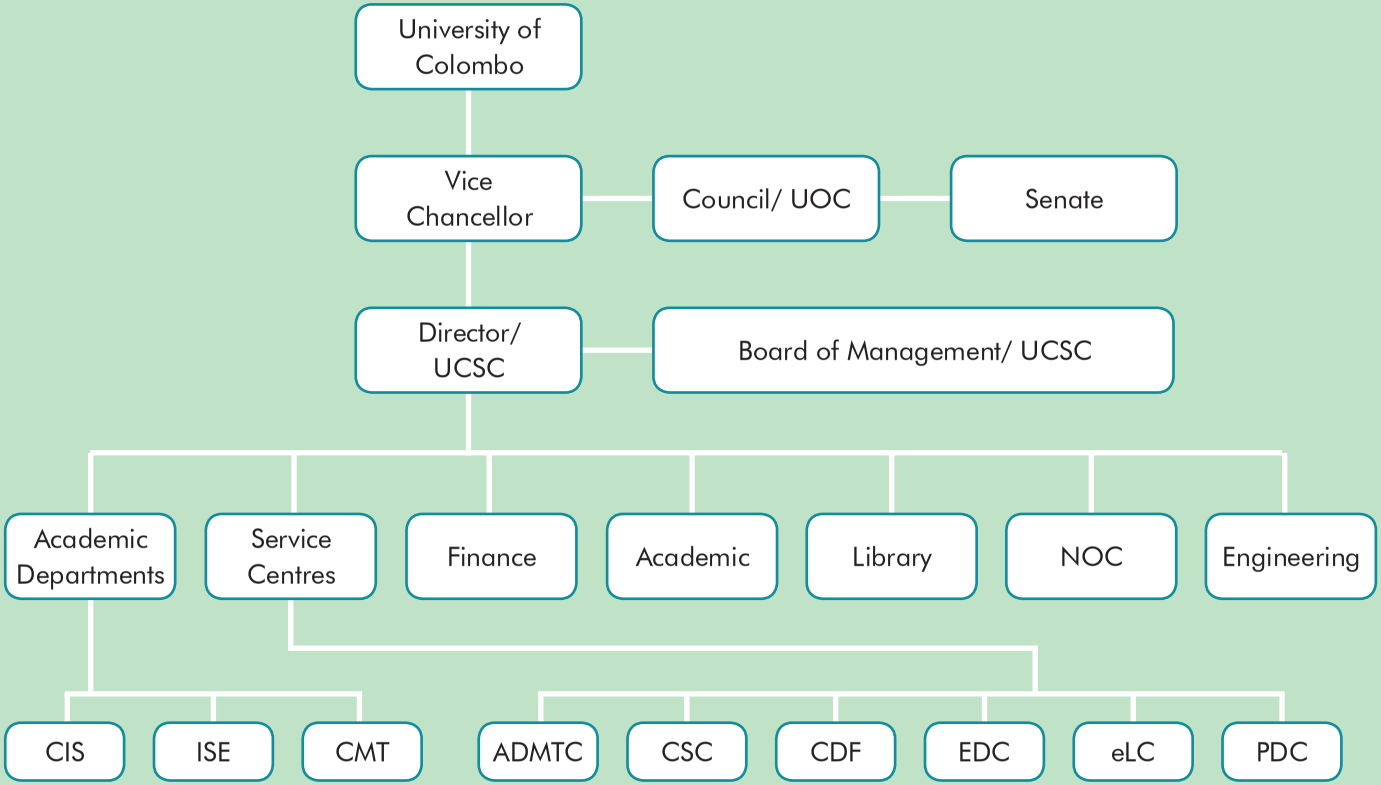



Figure 1: Main Administrational and Operational Units of UCSC

# CENTRES OF THE UCSC

UCSC also performs several secondary activities. These activities are organized under six separate centres. Each centre has a coordinator who manages the day-to-day operations of the centre. The six centres are as follows:

## Advanced Digital Media Technology Centre (ADMTC)

Advanced Digital Media Technology Centre (ADMTC) was established under the UCSC in order to implement the "Project for Human Resource Development in Information Technology through capacity building of the UCSC" that was supported by JICA. The centre is equipped with a state of the art digital studio and multimedia laboratories. Centre also conducts several training programmes in Multimedia, e-Learning and Digital Media Production. ADMTC produces many UCSC videos including BIT TV programmes.

**Coordinator**: Dr. S. S. P. Mathara Arachchi
For more details visit the website: *https://ucsc.cmb.ac.lk/admtc*

## Centre for Digital Forensics (CDF)

Centre for Digital Forensics (CDF) of the UCSC was established in 2011. The advisory panel consists of UCSC and foreign academics. UCSC has played a key role in assisting the Sri Lanka Police and the Criminal Investigation Department since 2003. The centre investigates evidence of digital crimes.

**Coordinator**: Dr. T N K De Zoysa
For more details visit the website: *http://www.ucsc.cmb.ac.lk/cdf*

## Computing Services Centre (CSC)

The Computing Services Centre (CSC) of UCSC is the main consultancy arm of the UCSC. It conducts system design and development, system recommendation, software project consulting, recruitment testing, tender evaluation, feasibility study and acceptance tests for computer hardware and software. It also conducts tailor-made training programmes for the organizations in both private and public sectors. The CSC, carries out the software development activities of UCSC.

**Coordinator**: Dr. K. L. Jayaratne
For more details visit the website: *http://www.ucsc.cmb.ac.lk/csc*

## External Degrees Centre (EDC)

The main purpose of establishing the External Degrees Centre (EDC) and the three year external degree programme, Bachelor of Information Technology (BIT) is to widen the higher educational opportunities for the students who have been unsuccessful in meeting the competitive eligibility criteria for admission to the state university system. Another reason has been the massive demand from the ICT industry for high quality human resources far exceeding the number provided by the state universities. The BIT degree programme commenced in the year 2000 and has so far produced 1242 graduates so far and almost all have been absorbed by the ICT industry. Internal students of the University of Colombo have the right to follow BIT degree programme since it is a part time programme.

**Coordinator**: Mr. W. V. Welgama
**Academic Coordinator**: Dr. (Ms.) K H E L W Hettiarachch
For more details visit the website: *http://www.bit.lk*

## E-Learning Centre (e-LC)

The UCSC was identified by donor agencies such as the Swedish International Development Agency (SIDA) and European Union Asia Link Programme as an ideal organization for a centre of excellence in e-Learning. In 2003, e-Learning Centre (e-LC) was established to provide an online learning environment for all its internal and external students. The centre provides the necessary support to develop and maintain interactive e-Learning content and environment. Also, the online virtual learning environment of the BIT degree programme (http://vle.bit.lk) is managed by them.

**Coordinator**: Dr. (Ms.) T A Weerasinghe
For more details visit the website: *http://www.ucsc.cmb.ac.lk/elc*

## Professional Development Centre (PDC)

The Professional Development Centre (PDC) of the UCSC was set up to keep a close liaison with the IT industry and to improve the academic programmes through industry partnership. The PDC primarily concentrate on improving professional skills of the staff and the internal students, industrial placements and visits for internal undergraduates and promoting inter-cultural harmony. The mission of the Professional Development Centre (PDC) of the UCSC is to produce Computing graduates having extra-curricular skills such as professional skills, business skills, communication skills, community service skills, innovative capacity and

entrepreneurship to pursue successful careers thereby contributing to the socio-economic development of Sri Lanka.

**Coordinator**: Dr. (Ms.) L. N. C. de Silva

For more details visit the website: *http://www.ucsc.cmb.ac.lk/pdc*

# KEY OFFICIALS OF THE UNIVERSITY OF COLOMBO

| Chancellor | |
|---|---|
| His Grace the Most Reverend Dr. Oswald Gomis |  |

| Vice Chancellor | |
|---|---|
| Senior Prof. Chandrika N Wijeyaratne<br>Contact No: (+94) 112583810<br>E-mail: vc@cmb.ac.lk |  |

| Registrar | |
|---|---|
| Mr. K A S Edward<br>Contact No: (+94) 112581835<br>(+94) 112583810<br>E-mail: registrar@admin.cmb.ac.lk |  |

| Senior Student Counselors | |
|---|---|
| Dr. G R P Silva<br>Contact No: (+94) 112583108<br>E-mail: priyankara@gmail.com |  |
| Ms. S R S D K Weerawansa<br>Contact No: (+94) 112583108 |  |

## Director - Physical Education

Mr. U D A U Dahanayake
Contact No: (+94) 112502405



## Chief Medical Officer - Medical Centre

Dr. K D I Wasudeva
Contact No: (+94) 112584985



## Acting. Deputy Chief Marshal - Marshall Office

Mr. P S P Direcksze
Contact No: (+94) 112583107
(+94) 112559906
E-mail: dcm@mo.cmb.ac.lk



## KEY OFFICIALS OF THE UCSC

| Director | |
|---|---|
| Prof. K P Hewagamage<br>Contact No: (+94) 112158950<br>E-mail: kph@ucsc.cmb.ac.lk |  |

| Deputy Director | |
|---|---|
| Dr. D A S Atukorale<br>Contact No: (+94) 112158965<br>E-mail: aja@ucsc.cmb.ac.lk |  |

# HEADS OF DEPARTMENTS

## Department of Communication and Media Technologies

Dr. G D S P Wimalaratne
Contact No: (+94) 112581245 Ext: 8949
E-mail: spw@ucsc.cmb.ac.lk



## Department of Computation and Intelligent Systems

Dr. D A S Atukorale
Contact No: (+94) 112581245 Ext: 8965
E-mail: aja@ucsc.cmb.ac.lk



## Department of Information Systems Engineering

Dr. (Ms.) M D J S Goonetillake
Contact No: (+94) 112581245 Ext: 8945
E-mail: jsg@ucsc.cmb.ac.lk



# UNDERGRADUATE COURSE COORDINATORS

## Information Systems

Dr. T N K De Zoysa
Contact No: (+94) 112581245 Ext: 8973
E-mail: kasun@ucsc.cmb.ac.lk



## Computer Science

Dr. M G N A S Fernando
Contact No: (+94) 112581245 Ext: 8992
E-mail: nas@ucsc.cmb.ac.lk



## Software Engineering

Mr. W. V. Welgama
Contact No: (+94) 112581245 Ext: 8975
E-mail: www@ucsc.cmb.ac.lk



## CENTRE COORDINATORS

### PDC (Professional Development Centre)

Dr. (Ms.) L N C De Silva
Contact No: (+94) 112581245 Ext: 8962
E-mail: lnc@ucsc.cmb.ac.lk



### e-LC (eLearning Centre)

Dr. (Ms.) T A Weerasinghe
Contact No: (+94) 112581245 Ext: 8982
E-mail: taw@ucsc.cmb.ac.lk



### ADMTC (Advanced Digital Media Technology Centre)

Dr. S S P Mathara Arachchi
Contact No: (+94) 112581245 Ext: 8978
E-mail: ssp@ucsc.cmb.ac.lk



### CSC (Computing Services Centre)

Dr. K L Jayaratne
Contact No: (+94) 112581245 Ext: 8980
E-mail: klj@ucsc.cmb.ac.lk



## EDC (External Degrees Centre)

Mr. W. V. Welgama
Contact No: (+94) 112581245 Ext: 8975
E-mail: www@ucsc.cmb.ac.lk



## CDF (Centre for Digital Forensics)

Dr. T N K De Zoysa
Contact No: (+94) 112581245 Ext: 8973
E-mail: kasun@ucsc.cmb.ac.lk



## ADMINISTRATIVE STAFF

### Deputy Registrar

Mr. K K K Dharmathilaka
Contact No: (+94) 112591075
E-mail: kkk@ucsc.cmb.ac.lk



### Deputy Registrar - Academic and Publications

Ms. H P Henegama
Contact No: (+94) 112589123 Ext: 8990
E-mail: dra@ucsc.cmb.ac.lk



### Deputy Bursar - Financial Administration

Mr. E M Gunarathna
Contact No: (+94) 112158942
E-mail: emg@ucsc.cmb.ac.lk



## Senior Assistant Registrar - Examinations and Registration

Ms. D K M Ratnayake
Contact No: (+94) 112151245 Ext: 8996
E-mail: dkm@ucsc.cmb.ac.lk



## Senior Assistant Registrar - Establishments

Ms. S D Chandralatha
Contact No: (+94) 112151245 Ext: 8929
E-mail: sdc@ucsc.cmb.ac.lk



## Senior Assistant Registrar - Postgraduate, Research and Projects

Ms. J A Maduka Wijerathna
Contact No: (+94) 112581245 Ext: 8994
E-mail: msw@ucsc.cmb.ac.lk



## Senior Assistant Bursar - Salaries and Loans

Ms. V G M Priyangika
Contact No: (+94) 112158942
E-mail: vmp@ucsc.cmb.ac.lk



## Senior Assistant Bursar - Accounts and Payments

Ms. K H A De Silva
Contact No: (+94) 112158935
E-mail: sal@ucsc.cmb.ac.lk



## Assistant Registrar - Examinations and Registration

Ms. S F Imam
Contact No: (+94) 112158996 Ext: 8996
E-mail: sfi@ucsc.cmb.ac.lk



## Assistant Registrar - Academic and Publications

Ms. K Prathayini
Contact No: (+94) 112151245 Ext: 8995
E-mail: paa@ucsc.cmb.ac.lk



## Assistant Registrar - Director's Office / CDF / ELC / ADMTC / CSC

Ms. P M K Jayarathna
Contact No: (+94) 112591066
E-mail: mdr@ucsc.cmb.ac.lk



## Assistant Registrar - External Degrees Centre

Ms. W M N K Weerasooriya
Contact No: (+94) 114720511 / 0114720512
E-mail: nkw@ucsc.cmb.ac.lk



## Assistant Bursar - Procurements

Mr. K A H K Jayarathna
Contact No: (+94) 112581245 Ext: 8943
E-mail: hkj@ucsc.cmb.ac.lk



# UNDERGRADUATE STUDENT LIFE



# LOCATION AND VICINITY OF THE CAMPUS

The University of Colombo is situated in the heart of the Colombo city called Cinnamon Gardens. It is surrounded by nationally important landmarks such as the Prime Minister's Office, Colombo Town Hall, National Museum, as well as interesting tourists attractions such as Vihara Maha Devi Park, Public Library, independence square, Arcade Independence Square, Gallface Green, Gangaramaya Temple, many other churches and mosques, Floating market, BMICH, Nelum pokuna and Planetarium etc. So as an undergraduate, you are not going to have only your education here, but also you can enjoy your life and feel the world. Following is a list of major directions which may guide when you are reaching the university.

## BUS ROUTES

Refer to the UOC map provided at the back cover, for the Bus Stops given below.

- **From Pettah/Town-Hall side**: Bus route numbers 138, 120, 122, 125 (Bus Stop B and C)
- **From Borella Junction/Kandy Road**: Bus route number 154 (Bus Stop F)
- **From Galle side**: Get down at Bambalapitiya Junction, if you're coming by bus route numbers **02, 32, 100, 101, 400, 401,** and **430** take route number **104, 154** or **155** bus to University. (Bus Stop A and F)
- **From Ratnapura/Highlevel Road**: Bus route numbers 138,125,122 (Bus Stop A)
- **From Horana road**: 120, 162 (Bus Stop A)
- **From Mattakkuliya**: Bus route number 155 (Bus Stop B and C)

For more details on Colombo bus routes please visit:
*http://en.wikipedia.org/wiki/Western_Province_%28Sri_Lanka%29_bus_routes#Colombo_Metropolitan_Routes*

## RAILWAY ROUTES

Refer to the UOC map provided at the back cover, for the Bus Stops given below.

- **From Coastal line**: Get down at Bambalapitiya Railway Station and take **104**, **154** or **155** from there to University.(In order to take these buses, you should come to the Galle road) Or get down at Pettah
- **From Kelani Valley line**: Get down at Cotta road and get route number **154** bus from Borella. Otherwise get down at Pettah and take route numbers **138** or **120**

**From the other lines**: Get down at Pettah and take route number **138**, **120**, **122** and **125** buses to University. If you get down at **Maradana**, take route number **155** bus or walk down to D.R. Wijewardhana Mawatha and take route number **120**, **125** or **122** bus.

# UNDERGRADUATE STUDENT ENROLMENT

Following sub sections describe the process of undergraduate student enrolment and related details.

## ENROLMENT PROCEDURE AND FEES

Students should be enrolled for respective courses by completing the necessary application forms by paying the relevant fees at the enrolment.

Table 2.1: Fee Structure

| Type of Fee | Amount (Rs.) | When to Pay |
|---|---|---|
| Student ID Fee | 250.00 | During the 1st year registration only |
| Laboratory Fee | 1,000.00 | At the 1st year registration only |
| Library Fee | 500.00 | At the 1st year registration only |
| Student Charter Fee | 100.00 | At the registration only |
| Total | 1850.00 | |

Table 2.1: Fee Structure

| Type of Fee | Amount (Rs.) | When to Pay |
|---|---|---|
| Annual Registration Fee | 600.00 | At the beginning of each academic year |
| Annual Medical Fee | 500.00 | At the beginning of each academic year |
| Annual Student Union Fee | 200.00 | At the beginning of each academic year |
| Annual Amalgamated Club Fee | 200.00 | At the beginning of each academic year |
| Total | 1500.00 | |

It is important to note that the students are required to be re-registered at the beginning of each academic year by paying the annual registration fee, annual medical fee, annual student union fee and annual amalgamated club fee on or before the date specified by Exams division. Failure to do so may result in cancellation of the studentship, the rights to claim Bursary or Mahapola payments and the right to vote at the election of the student union.

## ORIENTATION PROGRAMME

The main objective of the orientation programme is to prepare the students for the university life and guide them to improve their communication skills and ICT literacy required for the respective study programmes. Generally, the orientation programme will be conducted for about two weeks prior to the beginning of the academic year. It starts with an inauguration ceremony where the academic staff welcome new students and their parents. The Vice Chancellor of the University of Colombo, the Director of UCSC, the student counsellors and the heads of academic study programmes will address the audience introducing the University of Colombo School of Computing. The students will also be able to talk to their advisors after this ceremony.

There is a separate coordinator for the orientation programme and he/she will be supported by the academic programme coordinators and head of undergraduate studies. All senior and junior academic staff including some selected senior students from the final year will collaborate to conduct the orientation programme. All students should participate in the laboratory sessions for communication skills and ICT in the morning or afternoon depending on their group which may contain around 40 students per group. The syllabus of these courses and learning materials are published in the

Virtual Learning Environment (VLE) of undergraduate students at http://ugvle.ucsc.cmb.ac.lk

## STUDENT INDEX AND REGISTRATION NUMBER SYSTEM AND ID CARD

Student Registration numbers and Index numbers are prepared by the Examinations & Registration Division. When a student is registered at UCSC, he/she is given a temporary student number. After the vacancies of the UCSC are filled by the UGC, registration numbers will be allocated to individual students. **Once the registration number is issued, students will not be able to use temporary student number to obtain university services**. The registration number is prepared according to the ascending order of student's name with their initials. The Index number has eight digits and it is prepared according to the registration number.

Eg:
Registration Number: 2017/CS/052

Eg:
Index Number: 17000526

Student ID cards are issued by the University of Colombo. The students have to submit an application form with four photographs when enrolling to UCSC. When students want to use the university facilities, they should provide their university ID card for identification. If a student losses the student ID card, he/she must inform it to the marshal office along with a police report, a request letter and a payment receipt of Rs. 250.00 for a new student ID card.

## SCHOLARSHIPS

The University Grants Commission and the Ministry of Trade and Consumer Affairs select the eligible students for the Mahapola Scholarships. The UCSC notifies the students who are qualified to receive Mahapola Scholarships thereafter.

The UCSC selects the eligible students for the bursary payments according to the UGC Commission Circular No: 856, 900 and others. Selected students are informed through a public notice.

Bursary assistance scholarships are also available for eligible UCSC students.

Application forms for bursary scholarship are available at the Academic and Publications Division (W 314, third floor). Details of Mahapola and bursary scholarships are given in Table 2.2.

Table 2.2: Details of Mahapola & Scholarships

| Mahapola Scholarships (Rs.) | | Bursary Assistance (Rs.) | |
|---|---|---|---|
| Merit Scholarship | 5050.00 | Merit Scholarship | 4000.00 |
| Ordinary Scholarship | 5000.00 | Ordinary Scholarship | 3900.00 |

The Mahapola Scholarship will be revoked by the Mahapola Trust Fund if three consecutive instalments are not collected by a student.

There are several private scholarships for the students and the information about them will be announced once the academic programme is started. The students who face critical financial problems are also assisted using the UCSC student welfare fund which has been established using a portion of generated income of postgraduate and external degree programmes. Those other UCSC scholarships are as follows.

- Scholarship from Student Distress and Welfare Fund
- Scholarship from other organizations and donors

Students could obtain more details from the Academic and Publication Division or relevant student counsellors of UCSC.

## HOSTEL FACILITIES

Limited hostel facilities are provided by the UCSC for the first year students based on the government regulation as well as availability. Presently, the boys' hostel is situated in 218/8 Kaduwela Road, Battaramulla. The girls' hostel is situated in No. 76/16A Sunethradevi Mawatha, Kohuwala, Nugegoda. The students who are failed to obtain hostel accommodation, are advised to find their own accommodation. Senior students and academic staff could be consulted to obtain assistance or advices. All the students who will receive hostel facilities should sign the relevant agreement and must obey the rules and regulations during their stay at the hostel. The Academic and Publication branch is the responsible office to be contacted in the matters regarding hostel facilities.

## RAILWAY SEASON TICKETS

The students are eligible to obtain the Government railway season tickets at the concessionary rates. The application forms for railway season tickets can be collected from the Academic & Publications Branch of UCSC.

## GUIDANCE AND COUNSELLING

Student counselling is a free of charge service provided by the UCSC to all undergraduate students. Our experience over the past decade has shown that the level of stress resulting from various incidents of life such as family matters, relationships, learning and career decisions keep increasing.

The UCSC counselling service is focused on providing an environment conducive for students to get help at an early stage of their particular psychosocial problem. Our counsellors are qualified to give students a listening ear and to assist them to help themselves in dealing with issues that they are facing. However, the counsellors are also trained to make a decision; whether a particular problem requires further help, and guide such a student towards a Professional Counsellor who visits the UCSC for 2 hours per each day.

It is important to note that all the information that you communicate with the student counsellors will be kept confidential and will only be communicated to the Professional Counsellor if the student agrees. Similarly, the Professional Counsellor will only communicate back to the UCSC if there is any action required from the UCSC with respect to any impact on the issue of the study program that the student is engaged in. If the Professional Counsellor determines that further help is needed he/she will refer the student, with his/her consent, to a Clinical Psychologist or Psychiatrist.

The Student Counsellors, also want each student who enters the UCSC to form the front-line of the counselling process, by being sensitive and alert to any unusual behaviour of a colleague, so that they may help them by bringing them to the counselors at the **early stage** of a problem which might cause unbearable stress.

Dear Students,

During the university, you are supposed to engage with lots of challenging activities and often have to work under stress which might sometimes exceed your emotional vulnerabilities. Also, most of you have to stay away from your parents and loved ones with whom you could share your sorrows. At such instances, do not think that you are alone, we, student counsellors are there to help you, listen to your worries and help you to overcome your difficulties. Therefore, do not get hesitated, come and talk to us or send us an email message to make an appointment.

Student Counsellors, UCSC

## STUDENT COUNSELLORS

Mr. G P Seneviratne
Contact No: (+94) 112581245 Ext: 6309
(+94) 7773832935
E-mail: gps@ucsc.cmb.ac.lk



Dr. (Ms.) T A Weerasinghe
Contact No: (+94) 112591080
(+94) 716890280
E-mail: taw@ucsc.cmb.ac.lk



## UCSC PROFESSIONAL COUNSELLOR

Ms. Nilani Thushanthika
Contact No: (+94) 702005550



# UGVLE

http://ugvle.ucsc.cmb.ac.lk is the Virtual Learning Environment (VLE) established for the undergraduate students (UG). The students can access lecture materials, assignments and notices of their courses to actively participate in the academic activities. At the same time, they can also collaborate with teachers and students through this Virtual Learning Environment, known as UGVLE.

When new students are registered, to undergraduate programme, they will receive a temporary student number which will be the username to access the UGVLE. The password and how to login to the UGVLE will be described during a special session of the orientation. Your formal registration number will be issued during the first semester of academic year and the username will be changed to this number. Note that you must have an email address to access the service of UGVLE.

If there is any issue to access the UGVLE, students should contact the UGVLE administrator at the e-learning centre.

**Directions to the e-Learning Centre:** Go through the pessage accessed by the door next to the ADMTC. Turn left.

# LIBRARY

The UCSC Library provides its service to the staff and students of the UCSC and it has a special collection of computer science and information technology related books, magazines, and proceedings. More than 500 undergraduate and postgraduate thesis collection (hard copies) is available for student reference. There is also a small collection of science and mathematical books to support students to improve their background knowledge for studies. A Sinhala novel collection is also available at the library for leisure reading. Also students can access the soft copies of theses, selected books, proceedings, etc. through the digital library (*http://documents.ucsc.lk/jspui/*).

Library Opening hours:

| | | |
|---|---|---|
| Regular Academic Period | 9.00 AM – 5.30 PM | Monday to Friday |
| During the Study Leave and Examination Period | 9.00 AM – 7.30 PM | Monday to Friday |
| | 9.00 AM – 5.30 PM | Saturdays and Sundays |

| Vacation Period | 9.00 AM – 4.00 PM |
|---|---|

**The library will be closed on all public holidays (including poya days).**

### STUDY AREAS

There are two study areas in the library and one area has around 10 computers allowing students to access the digital library of UCSC, http://documents.ucsc.lk/jspui. Students could access dissertation and thesis of past studies of UCSC. The **General Reading Area** has a seating capacity of 110 and you can study individually or as groups in this area. The **Reference Reading Area** has a seating capacity of 44 for the students to study individually. There is a separate staff reading area having a seating capacity of 08.

### BORROWING AND RETURNING BOOKS

Students can borrow both academic books and general reading books from the library (two books at each time for a duration of two weeks). It is required for the students to bring their student identify card to enter the library as well as to borrow and return books from the library. Students are advised to follow the rules and regulations which are displayed at the library, when they use library facilities. There will be fines for not returning the borrowed books on the due date or loss of books.

### OTHER SERVICES

Students can download past papers using VLE, hard copies of past papers are also available in the library. Students can download soft copies of selected IEEE & ACM research papers by providing the relevant URL.

## LABORATORY FACILITIES

There are 8 undergraduate laboratories with more than 260 computers and the computers are connected to local area network to access common resources as well as Internet. Linux and/or Microsoft operating systems are available in these computers depending on the requirements to be selected at the start-up of a computer. The students require a username and a password to access these computers which will be issued by the Network Operating Centre of UCSC based on student registration number. All these labs are open during the semester from 8.00 am to 5.00 pm. However based on the

need, some laboratories may continue to operate until 7.00 pm. Laboratory facilities are usually not provided during study leave and vacation. Network Operating Centre of UCSC should be contacted regarding matters related to laboratory facilities.

### BASIC RULES OF IT LABS

It is extremely important that students must follow the general rules of conduct to maintain a positive user experience in UCSC computer laboratories. Laptops and bags are not allowed in labs. All the food items including water bottles are strictly prohibited inside the computer lab. Computers and other technical items in the lab must not be moved or configured without the approval of teaching staff or NOC. Moreover, the student must not install any software without the approval from the teaching staff. Students are strictly prohibited to download non-educational files (e.g. torrent files). It is to be noted that the violation of any of these rules may result in disciplinary actions.

## OBTAINING WI-FI CONNECTIVITY

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

The UCSC will monitor all user activities according to UGC policy and guidelines. Students are strongly advised not to engage in unethical or illegal activities using Internet connection and computing resources and all such activities are monitored to identify. There is a limited bandwidth allocation for each user and the students must not misuse this bandwidth to download large files without permission, play games during working hours, and access illegal/unethical sites using computing resources of UCSC. Those who violate these conditions will have to face disciplinary actions.

## SERVER FACILITIES

UCSC has an internal private cloud infrastructure and UCSC is the first government institute to have that facility in Sri Lanka.

All the interactive servers are located in this virtualization environment, and students can request server space for hosting their projects.

## EMAIL POLICY

University of Colombo School of Computing will provide each student with an email address (Gmail Account). UCSC provides these email addresses to enhance the educational standards and administrative efficiency. Once, these accounts are created, the student has the sole responsibility to protect its resources in an efficient, ethical and lawful manner. Further rules and regulations apply for account creation, ownership, privacy, expiration, inappropriate activity, data and information.

## HEALTH FACILITIES

The Health Centre is located in a close proximity to the UCSC and these facilities are available for all UCSC students. It provides outpatient treatment and medical consultation for all health issues. A Dental Unit is also attached to this centre and it is open on Monday, Wednesday and Friday. The health service is organized to assist students to have an active and healthy life during their academic life.

## PHYSICAL EDUCATION & SPORTS

There are several sports facilities, such as Gymnasium, Playground and Tennis Courts which are made available by the Department of Physical Education of the University of Colombo. The Physical Education Department is located on the first floor of the gymnasium which is situated on the other side of Reid Avenue from the UCSC and near the Faculty of Education. Those facilities can be used by the UCSC students and they can also participate in the events organized by the University. In the past, UCSC students have excelled in sports and have represented the university at the local and international levels.

# STUDENT SOCIETIES

## COMPUTER SCIENCE SOCIETY OF UNIVERSITY OF COLOMBO

Computer Science Society of the University of Colombo alias "CompSoc", is managed by the students of the university with the involvement and the guidance of the academic staff. It was established to enhance the general awareness of computing among undergraduate students and to provide assistance on computing related matters.

At the same time, CompSoc is also involved in social activities like conducting workshops to enhance the computer literacy of school students and teachers. CompSoc conducts a live radio programme known as "Internet Sampath Bhavithaya" which is broadcasted every week on Wednesdays from 9am – 10am in collaboration with the Sri Lanka Broadcasting Corporation. Through this program it is intended to improve the general public awareness of Internet and Information Technology for public use.

For more details, please refer *http://www.compsoc.lk*

## IEEE STUDENT BRANCH OF UCSC

IEEE is one of the world's largest professional organizations for the enhancement of technology. Not only professionals, but also the students occupied in technological studies are able to be benefited through IEEE. The student members are encouraged by IEEE in order to guide them for innovation of technological advancements in the future.

IEEE student branch of University of Colombo School of Computing has been formed with the participation and contribution of all four batches of UCSC and it has been organizing many activities to enhance professional development of the students. As well as the technological experience and knowledge, personality development skills such as organization, leadership, interaction can be gained by engaging the activities organized by the IEEE student branch of UCSC. The core purpose of the IEEE student branch of UCSC is to serve the humanity through the technological innovations.

The society organizes a number of workshops and conferences for both UCSC

students and members from another brother of IEEE student branches in Sri Lanka with the purpose of enriching them with the most modern technological knowledge in order to survive in the industry and encouraging them for innovations in technology.

For more details, please refer: *http://www.compsoc.lk/services/ieee-student-branch*

## UCSC ISACA STUDENT GROUP

The ISG is a student group, the purpose of which is, through student empowerment, to expand recognition of the IT audit and assurance, security and IT governance disciplines, by extending education beyond the classroom on standards, practices and certification. More specially, the objectives of the ISG are the same as listed in the professional chapter and the association's by-laws.

- To promote the education of and help expand the knowledge and skills of its members in the interrelated field of IT governance, IS audit, security, control and assurance.
- To encourage a free exchange of IT governance, IS audit, security, control and assurance techniques, approaches, and problem solving by its members.
- To promote adequate communication to keep members abreast of current events in IT governance IS audit, security, control and assurance that can be beneficial to them and their employers.
- To communicate to management, auditors, universities and to IS professionals the importance of establishing controls necessary to ensure proper IT governance and the effective organization and utilization of IT resources; and
- To promote the Association's professional certificate and IT governance.

## OTHER STUDENT SOCIETIES OF UNIVERSITY OF COLOMBO

There are number of diverse societies from diverse educational backgrounds of the University of Colombo. These societies have been established to enhance the welfare activities for students and to develop the leadership skills of the students.

These societies can be divided as subject specific societies and general societies. However, any student can become a member of any subject specific society. Following is a list of such societies.

| | |
|---|---|
| Catholic Student Society | Computer Science Society |
| Buddhist Society | Muslim Majlis |
| Science Society | Medical Faculty Arts Society |
| University of Colombo Christian Fellowship | Association of Wild Life & Photography Stu. Society |
| Economic Student Society | Geography Students Society |
| Gaveshakayo | Eksath Bikku Sangamaya |
| Oriental Music Society | State Circle |
| Chemical Society | Botanical Society |
| Physics Society | Epsilon-Delta Society |
| Hindu Society | Medical Students' Buddhist Society |
| Sinhala Sangamaya | Medical Students' Hindu Society |
| History Society | The Moor Court & Debating Society |
| Medical Student Welfare Society | Core Group for Disaster Relief |
| Tamil Society | Sociology Student Society |
| Student Association of Industrial & Finance Analysis (SALFA) | Base for Enthusiasts of Environmental Science and Zoology Society |
| Gavel Club | Physiotheraphy Student Society |
| Astronomical Society | AIESEC Student Society |
| Rotaract Club | |

### *General Operations of Student Societies*

All student societies are governed in accordance with their respective constitutions. When new office bearers are elected at the Annual General Meeting (AGM) or subsequent meeting, their names have to be notified to the Senior Student Counsellor's office and to the Senior Assistant Registrar, Welfare within one week of the meeting. It is hoped that these societies will work according to an annual activity plan. These societies have the power to raise funds for their activities. It is hoped that all the money raised will be deposited to the relevant bank accounts. All financial transactions must be

documented and presented at the AGM and these must be ratified. A copy of this document has to be sent to the Senior Student Counsellor's Office and to the Deputy Registrar, Welfare. To ensure the honesty and transparency in financial transactions, these accounts will be audited from time to time by the Accounts Division.

Based on the recommendations of the student members, an academic staff member will be nominated by the Vice Chancellor as the Senior Treasurer. This individual will take the responsibility of the Society in question.

## CANTEEN FACILITY

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).

## MARSHAL OFFICE

The Marshal Office is located near to the UCSC, at one side of the medical centre. Marshals have been appointed to assist the authorities to maintain discipline within the university premises.

Marshal office contact details are included in page 12

# UNDERGRADUATE DEGREE PROGRAMMES



# STRUCTURE OF PROGRAMMES

The medium of conducting Lectures, Tutorials, Practicals and Examinations is **English**. Computing degree programmes are classified under five broad areas, namely: Computer Science, Computer Engineering, Software Engineering, Information Technology and Information Systems as identified in IEEE ACM curriculum guidelines. UCSC offers Computer Science and Software Engineering under the Bachelor of Science in Computer Science intake through the UGC as internal students, Information Systems under the Bachelor of Science in Information Systems intake through the UGC as internal students and Information Technology under Bachelor of Information Technology intake as external candidates learning online with optional assistance from private training institutions.

Following sub sections will describe an overview of the methodology used to conduct the degree programme.

## GRADUATE PROFILE

A graduate of the University of Colombo School of Computing should be able to:

- Demonstrate the knowledge of theories and concepts in computing together with the applications in the area of specialization.
- Apply creativity and problem-solving skills to solve real-world problems using the knowledge of computing.
- Visualize different levels of a system from a higher level of abstraction to a detail level in the context of user interaction and other systems in the world.
- Contribute as a member or a leader in a team to achieve a common set of goals.
- Recognize professional responsibilities to make informed judgments in computing practice based on legal and ethical principles.
- Engage in independent lifelong learning for continual development as a computing professional.

## SEMESTER SYSTEM

Academic programmes of the UCSC are based on a semester system with two semesters per academic year and operate on a course module basis. Lectures, practicals, tutorials, continuous assessments and laboratory work shall be spread over a period of 15 weeks. Each semester may have one week mid-semester break at the mid of the semester and one or two weeks study leave at the end of the semester before the examinations. The semester examination will be conducted within subsequent period of 2-4 weeks followed by a vacation.

## HOURS AND CREDITS SYSTEM

The UCSC offers two types of courses namely Academic Courses and Enhancement Courses. Academic courses provide subject knowledge and enhancement courses provide knowledge on a wide range of disciplines that are required for a holistic education.

Each course is assigned a credit value. The credit value would depend on several factors among which the duration of the course and its nature are included. A credit is equal to 15 hours of lectures or 30 hours of practical or an equivalent combination of lectures and practical. 80% attendance will be a requirement for a course to be satisfied before taking the corresponding exam. Student should complete minimum of 30 credits in each year.

## COURSE CODE SYSTEM

Each course code consists of four digits along with the prefix SCS, IS, ENH or EN to indicate whether it is a Computer Science subject, Information Systems subject or Enhancement course. SCS and IS are academic Subjects while ENH (Computer Science) and EN (Information Systems) represent the Enhancement subjects. The first digit of each course code is the corresponding year (e.g: For a course in second year, it will be like 2xxx). Second digit represents the revision of the subject and it will be an increment if the subject is revised.

## CALCULATION OF GRADE POINT VALUE (GPV) AND GRADE POINT AVERAGE (GPA)

In the evaluation process, mark obtained by a student for each course is converted into a grade according to the scheme given in Table 3.1.

Table 3.1: Ranks and their Respective Grades

| Grade | Grade Point Value | Attainment |
|---|---|---|
| A+ | 4.00 | Superior |
| A | 4.00 | |
| A- | 3.70 | |
| B+ | 3.30 | Meritorious |
| B | 3.00 | |
| B- | 2.70 | |
| C+ | 2.30 | Adequate |
| C | 2.00 | |
| C- | 1.70 | |
| D+ | 1.30 | Minimal |
| D | 1.00 | |
| E | 0.00 | Failure |
| F | 0.00 | NC |

Grade Point Values associated with each grade are as shown in the Table 3.1. These GPV values are used to compute the Grade Point Average of a student by using the following equation.

$$\text{GPA} = \frac{\sum GPV \text{ for the Course} \times \text{Credit Value of the Course}}{\text{Total number of Credit Values completed by the student*}}$$

## ENHANCEMENT COURSES

Credits for some of the enhancement courses could also be obtained by participating in sports conducted by Department of Physical Education or by participating in competitions accepted by the course. Further information, could be obtained from the enhancement course coordinator.

## INTERNSHIP PROGRAMME

Industrial Training is an integral part of the 2 Degree Programmes conducted by the University of Colombo School of Computing (UCSC). This enables to provide much needed industrial exposure for the students, which is an essential part of the education to produce quality graduates in the fields of Computer Science (CS) and Information Systems (IS) to meet industrial standards.

The Industrial Training is scheduled for a period of 5-6 months (approximately) during the second semester of the third year of the students. This is managed through Professional Development Centre (PDC) in UCSC.

## AWARD OF HONOURS AND CLASSES

A Student who is qualified for the award of a degree—both general (3 year) and honours (4 year)—by completing all the relevant requirements will also be qualified for the award of a class as follows.

a. **First Class** - for obtaining a minimum overall GPA of 3.70
b. **Second Class (Upper Division)** - for obtaining a minimum overall GPA of 3.30
c. **Second Class (Lower Division)** - for obtaining a minimum overall GPA of 3.00

## ACADEMIC PROGRAMMES (INTERNAL UNDERGRADUATE)

The students who are admitted to the UCSC may read for a degree programme in Computer Science (CS) or Information Systems (IS). The UCSC offers a three year degree programme and four year degree programme/s in each of these disciplines.

The eligibility criteria that have to be fulfilled for a successful completion of these degree programmes, are described under Rules and Regulations chapter.

## OPEN AWARDS

There are a number of academic awards which could be obtained by high performance in undergraduate work, detailed in page 51, 76 and 96. Further, there is the award for "directors list" awarded on the basis of achieving academic excellence and extra-curricular activities.

## LECTURES

The lecture is the main method of delivering course material to the student. The semester lecture time table with the details of the allocations of venues and time periods is published online (UGVLE) and on relevant notice boards.

It is usual for the lectures to take place in the same venue at the same time

during the semester. But in exceptional situations or for some courses, the venue and the time might be changed. Most of the lectures will be held inside the UCSC building complex. The students must be in time for lectures and are expected to bring writing materials to take notes. Some lecturers will provide handouts but such handouts may not contain the entire record of the content covered in the lecture. Attendance of each student for the lectures will be recorded.

## TUTORIAL SESSIONS

Tutorial is a comprehensive way of developing a great understanding on course materials in a way to correct misunderstandings one may have. On average, a student can expect to have two tutorial sessions per week. The tutor who conduct the session may have his/her own way of organising the tutorial. Most of the tutorial sessions will be based on a particular problem sheet which will be distributed before the commencement of the session. The tutor is the first person for the student to consult when a problem arises while studying a particular course. It is found that many students who have attended all tutorial sessions and attempted all problem sheets; tend to do well at the final exam. Attendance for the Tutorial sessions will be recorded.

## PRACTICAL SESSIONS

The purpose of practical sessions is to give a better understanding on the application of the theories that were taught in the lecture in a practical viewpoint. Instructors will be present during practical sessions to help achieving the most out of the practical sessions. It is found that many students who have attended all practical sessions, tend to do well at the final exam. The attendance for the practical sessions will be recorded. The outcome of the practical sessions may affect to the final grade of the course. If a student is unable to attend to a practical session he/she should inform the instructor(s) if possible before the session. The organisation of the practical session will depend on the relevant lecturer/instructor.

## PERSONAL STUDY

Unlike the works carried out in secondary school, at the university, students are expected to do much more personal (self) studies and to have a “do it myself” attitude. Apart from lectures, tutorials, and practical classes, students will find that it is necessary to read other materials and workout additional problems to fully master the course. Hence, reference books which are recommended for each course will be a good starting point. The relevant lecturer/tutor/instructor

will suggest such materials.

## PROJECTS

Certain courses mandate completion of project(s) as a way of evaluation. Such projects could be done as a group project or as an individual project. Students will get a supervisor/mentor under whose guidance the project should be carried out. In such cases, during the project you are expected to meet the supervisor regularly. The organisation of the evaluation criteria of the project depends on the course itself. Therefore, it is beneficial for the students to have a clear idea about the criteria at the beginning of the course. The students should be proactive in arranging meetings with the supervisors. It is important to consider the supervisor's comments to carry out a successful project. It is better to choose appropriate technology to make programming easier so that the student will be able to concentrate on solving the problem. The students are strongly advised to manage the project properly in terms of time, distribution of workload and documentation.

## PRESENTATION (DEFENSE / ORAL-EXAMINATION / VIVA VOCE)

The students should do the presentations as a part of the evaluation or a learning activity of a course. Normally there will be an evaluation panel at the presentation. The presentations may be concluded with a question and answer (Q&A) session by the evaluation panel/audience. It is common for presentations to be used as the means of evaluating a project. The presentations can be done individually or as a group. It is expected that a presentation will help to improve the communication and presentation skills of the students. Usually a presentation will be guided by a set of presentation-slides. It is strongly advised to dress properly for the presentations.

## ASSIGNMENTS

Assignments are a method of evaluation which contributes to the final grade of a course. Assignments could be in various forms such as in-class, written, quiz, UGVLE based quiz, online assignments, coding, report writing, and oral (viva voce). Moreover, assignments could be individual or group and some assignments may be take-home. The number of assignments and the organisation of the assignments for a course depend on the lecturer.

## END SEMESTER EXAMINATIONS

There is a final examination at the end of each semester (Except for 3rd year second semester students.). All final examinations are paper-based exams which could be in the forms of multiple choice questions (MCQ), structured, or essay. The end semester examination process is managed by the Examination and Registration Division. The Examination and Registration Division will issue the admission cards for the examination at the end of the semester, and should be collected by students. Further, the timetable of the examination is published on UGVLE. Consider that some courses may not have paper-based exam at the end semester examination.

## FINAL GRADES

Final marks obtained by the student for each course is converted into a grade according to the scheme stated in the ByLaws/ Regulations of the corresponding undergraduate programme approved by the senate of the UOC. Thus, GPA is calculated using the final grade of each course that the student has followed. The final mark of a course is calculated using a rubric provided by the lecturer for each course associating portion of assignment marks and portion of written paper marks. Final grade of a course directly affects to the GPA of a student.

## HOLIDAYS

Both undergraduate programmes are considered as full time degrees. Therefore, full commitment for the degree is highly expected from the students. However, in case of exceptional requirements, students must contact student counsellors and send a request to the board of studies for internal undergraduate degrees (IUD) through student representatives.

Saturdays, Sundays, Poya-days and public holidays are considered as holidays for students. In addition, there are several types of vacations: Mid-semester break, Study leave, End-semester break, New year vacation and Christmas vacation. There will not be any lectures or any course work during the study leave and the exam time period.

| Vacation Type | Average Duration (weeks) | |
|---|---|---|
| Mid-semester break | 1 | At the middle of the semester |
| Study leave | 1 | Before an end semester exam |
| End-semester break | 4 | After the end semester exam |
| New Year vacation | 1 | Around April 13th |
| Christmas vacation | 1 | Around December 25th |

## INTERNAL QUALITY ASSURANCE CELL

The primary purpose of establishing the Quality Assurance Cell (QAC) is to create a culture that seeks to continually improve the quality of all academic and other activities in the Institute in line with the Quality Assurance and Accreditation Council of the University Grants Commission and Internal Quality Assurance Unit of the University of Colombo.

For more details visit the website:
https://ucsc.cmb.ac.lk/quality-assurance-cell/

## EMPLOYABILITY

Table 3.1: Ranks and their Respective Grades

| Programme | Number Graduated | Number Responded | Employed | Waiting for Jobs / Not interested |
|---|---|---|---|---|
| Bachelor of Computer Science | 156 | 135 | 93% | 7% |
| Bachelor of Information Systems | 81 | 80 | 94% | 6% |
| Total | 237 | 215 | 93% | 7% |

# COMPUTER SCIENCE DEGREE PROGRAMME

Computing for undergraduates was first introduced a way back in 1967 as a part of Applied Mathematics of the Department of Mathematics, Faculty of Science. With the establishment of the Department of Statistics and Computer Science at the Faculty of Science in 1985, special degree programmes in Computer Science were introduced. The direct intake for Computer Science was introduced in 1998 along with industrial placement and accreditation of the degree program. With the establishment of the UCSC in 2002, the direct intake was moved to the UCSC.

This four (04) year Computer Science special degree programme (2+2) was commenced in 1990 by selecting students who were enrolled for the Faculty of Science from batches onwards 1985/86. It was offered by then Department of Statistics and Computer Science of the Faculty of Science. The students were selected based on their performance in the first two years of the degree programme. The number of selected students for the programme gradually increased from 25 to 40. This programme continued for 18 batches until the Faculty of Science 2002/03 intake. This was replaced by 3 and 4 years Computer Science degrees from the 2002/03A intake of the UCSC.

Currently, Based on students' performance and preference of first two years, a selected number of students will be able to follow a four year degree course leading to either the degree in Bachelor of Science Honours in Computer Science [B.Sc.(Hons) in Computer Science] or the degree in Bachelor of Science Honours in Software Engineering [B.Sc. (Hons) in Software Engineering].

Please refer page 109 for the degree awarding criteria.

## COMPUTER SCIENCE DEGREE STREAM

The meaning of digits and symbols used in the course tables:

| | |
|---|---|
| Lecture 1/2 | One or Two hours lecture per week during the semester |
| Practical 1/2 | One or Two hour practical session per week during the semester |
| X | Compulsory Course |
| O | Optional Course (Student has to register) |
| * | Offered throughout the year |

| ***YEAR 1*** *(All Compulsory)* | | | | |
|---|---|---|---|---|
| Semester | Course Code | Course Name | Credits | |
| | | | Lecture | Practical |
| 1 | SCS 1201 | Data Structures and Algorithms I | 2 | 1 |
| 1 | SCS 1202 | Programming Using C | 2 | 1 |
| 1 | SCS 1203 | Database I | 2 | 1 |
| 1 | SCS 1204 | Discrete Mathematics I | 2 | - |
| 1 | SCS 1205 | Computer Systems | 2 | - |
| 1 | SCS 1206 | Laboratory I | 1 | 1 |
| 1 | SCS 1207 | Software Engineering I | 2 | |
| 1 | ENH 1201 | Enhancement I (Communication Skills) | 1 | - |
| 2 | SCS 1208 | Data Structures and Algorithms II | 2 | 1 |
| 2 | SCS 1209 | Object Oriented Programming | 2 | 1 |
| 2 | SCS 1210 | Software Engineering II | 2 | - |
| 2 | SCS 1211 | Mathematical Methods I | 2 | - |
| 2 | SCS 1212 | Foundation of Computer Science | 2 | - |
| 2 | SCS 1213 | Probability and Statistics | 2 | - |
| 2 | SCS 1214 | Operating Systems I | 2 | 1 |
| 2 | ENH 1202 | Enhancement II | 1 | - |

| ***YEAR 2*** *(All Compulsory)* | | | | |
|---|---|---|---|---|
| Semester | Course Code | Course Name | Credits | |
| | | | Lecture | Practical |
| 1 | SCS 2201 | Data Structures and Algorithms III | 2 | 1 |
| 1/2 | SCS 2202 | Group Project I* (2 credits/ 2 semester) | - | 4 |
| 1 | SCS 2203 | Software Engineering III | 2 | - |
| 1 | SCS 2204 | Functional Programming | 2 | 1 |
| 1 | SCS 2205 | Computer Networks I | 2 | 1 |
| 1 | SCS 2206 | Mathematical Methods II | 2 | - |
| 1 | SCS 2207 | Programming Language Concepts | 2 | - |
| 1 | SCS 2208 | Rapid Application Development | 2 | 1 |
| 2 | SCS 2209 | Database II | 2 | 1 |
| 2 | SCS 2210 | Discrete Mathematics II | 2 | - |
| 2 | SCS 2211 | Laboratory II | 2 | 1 |
| 2 | SCS 2212 | Automata Theory | 2 | - |
| 2 | SCS 2213 | Electronics and Physical Computing | 2 | 1 |
| 2 | SCS 2214 | Information System Security | 2 | - |
| 2 | ENH 2201 | Enhancement III (Entrepreneurship) | 1 | - |

| YEAR 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Semester | Course Code | Course Name | BSc Honours in CS | BSc Honours in SE | BSc in CS | Credits | |
| | | | | | | Lecture | Practical |
| 1 | SCS 3201 | Machine Learning and Neural Computing | X | O | O | 2 | - |
| 1 | SCS 3202 | Advanced Computer Architecture | O | O | O | 1 | - |
| 1 | SCS 3203 | Middleware Architecture | O | X | O | 2 | 1 |
| 1 | SCS 3204 | Management | O | O | X | 2 | - |
| 1 | SCS 3205 | Computer Graphics I | O | O | O | 2 | - |
| 1 | SCS 3206 | Graph Theory | X | O | O | 1 | - |
| 1 | SCS 3207 | Software Quality Assurance | O | X | X | 1 | 1 |
| 1 | SCS 3208 | Software Project Management | O | X | X | 2 | - |
| 1 | SCS 3209 | Human Computer Interaction | O | X | O | 2 | 1 |
| 1 | SCS 3210 | Systems and Network Administration | O | O | O | 2 | 1 |
| 1 | SCS 3211 | Compiler Theory | X | O | O | 2 | - |
| 1 | SCS 3212 | Mobile Application Development | O | O | O | 2 | 1 |
| 1 | SCS 3213 | Game Development | O | O | O | 1 | 2 |
| 1 | SCS 3214 | Group Project II | - | - | X | 1 | 2 |
| 1 | SCS 3215 | Professional Practice | X | X | X | 2 | - |
| 1 | SCS 3216 | Research Methods | X | O | - | 0 | 2 |
| 2 | ENH 3201 | Industry Placement/ Industry Project | X | X | X | 0 | 8 |

## YEAR 4

| Semester | Course Code | Course Name | CS | SE | Credits | |
|---|---|---|---|---|---|---|
| | | | | | Lecture | Practical |
| 1 | SCS 4201 | Ethical Issues and Legal Aspects in IT | | | 1 | - |
| 1 | SCS 4202 | Cognitive Robotics | | | 1 | 1 |
| 1 | SCS 4203 | Database III | | X | 2 | 1 |
| 1 | SCS 4204 | Data Analytics | | | 2 | 1 |
| 1 | SCS 4205 | Computer Networks II | | | 2 | - |
| 1 | SCS 4206 | Computer Graphics II | | | 2 | 1 |
| 1 | SCS 4207 | Image Processing and Computer Vision | | | 2 | |
| 1 | SCS 4208 | Theory of Computation | X | | 2 | |
| 1 | SCS 4209 | Natural Language Processing | | | 2 | 1 |
| 1 | SCS 4210 | Parallel Computing | | | 2 | 1 |
| 1 | SCS 4211 | Research Seminar | X | | - | 2 |
| 1 | SCS 4212 | Formal methods and Software Verification | X | X | 2 | - |
| 2 | SCS 4213 | Digital Forensics | | | 2 | - |
| 2 | SCS 4214 | Natural Algorithms | | | 2 | - |
| 2 | SCS 4215 | Computational Biology | | | 2 | 1 |
| 2 | SCS 4216 | Advanced Topics in Mathematics | | | 1 | - |
| 2 | SCS 4217 | Embedded Systems | | | 2 | 1 |
| 2 | SCS 4218 | Operating Systems II | X | | 2 | - |
| 2 | SCS 4219 | Distributed Systems II | | | 2 | - |
| 2 | SCS 4220 | Data Structures and Algorithms IV | | | 2 | - |
| 2 | SCS 4221 | Software Engineering IV | | X | 2 | 1 |
| 2 | SCS 4222 | Logic Programming | | | 2 | - |
| 2 | SCS 4225 | Philosophy of Science | X | X | 1 | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | SCS 4226 | Intelligent Systems | | | 2 | - |
| 1/2 | SCS 4223 | Final Year Project in Software Engineering* | | X | 0 | 8 |
| 1/2 | SCS 4224 | Final Year Project in Computer Science* | X | | 0 | 8 |

## MEDALS AND AWARDS FOR COMPUTER SCIENCE

These are some awards at the Annual Convocation for graduates with respect to degree programmes.

| | Candidates | Name of the Award |
|---|---|---|
| Best performance (Highest GPA) | 3rd Year Graduates | *Virtusa Academic Excellence Award* |
| | 4th Year Graduates | *Prof. Mohan Munasinghe Award* |
| Best Industrial Training (Awarded for Best Result at Industrial Training in 3rd Year) | 3rd /4th Year Graduates | *David Pieris Group Gold Medal* |
| Best Final year Project/ Research | 4th Year Graduates | *ICTA Award* |
| Most Outstanding Graduate of the UCSC (Combined award for CS and IS) | 4th Year Graduates | *Prof. V K Samaranayake Award* |
| Best Performance in BSc. (Hons) in Software Engineering | 4th Year Graduates | *IFS Award* |
| Best Final Year Project in BSc. (Hons) in Software Engineering | 4th Year Graduates | *Soma Goonetillake Memorial Award* |
| Best Performance in Software Engineering in BSc. (Hons) in Software Engineering | 4th Year Graduates | *Wimala Jayaratne Memorial Award* |

# COMPUTER SCIENCE COURSE DESCRIPTIONS

## Year 1 Courses

### *SCS 1201 - Data Structures & Algorithms I*

Introduces different data structures used in programming such as lists, stacks, and queues, trees, several types of linked lists and their applications and implementation. (Identify important properties and uses of such data structures , Usefulness of stacks, queues and trees (general trees, Binary trees, BST,AVL trees) for solving common problems, write pseudo code and python code to implement and use these data structures.Algorithms such as Bubble sort, Linear insertion, Selection sort, Merge, Shell, Heap, Quick, Straight Radix, and Radix Exchange sort are explained and Write pseudo code and python code to implement the above sorting algorithms. Discuss the running time of the above written codes.

### *SCS 1202 - Programming Using C*

The following objectives are covered in this course. Analyze and explain the behavior of simple programs involving the fundamental programming constructs using a functional paradigm such as Scheme/Scala, Identify and describe uses of primitive data types, write programs that use each of the primitive data types, modify and expand short programs that use standard conditional and iterative control structures and functions, design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, the definition of functions, and parameter passing, choose appropriate conditional and iteration constructs for a given programming task, describe the concept of recursion and give examples of its use, identify the base case and the general case of a recursively-defined problem.

### *SCS 1203 - Database I*

Database I, introduces the components of a database system and major DBMS functions. Data modelling, Relational database design, Structured Query Languages (SQL) are covered in the course module.

### *SCS 1204 - Discrete Mathematics I*

This course module includes sets, relations and functions such as Union and Intersection. Also basic logic is introduced here with truth tables, predicate logic and propositional logic. It also discusses proofs, equivalence, contradiction and the other techniques of proofs.

### *SCS 1205 - Computer Systems*

Computer Systems introduces the history of the computer systems, along with the knowledge of how the computer works starting from the data representation, basic logic circuit design to the CPU cycles and memory.

### *SCS 1206 - Laboratory I*

Laboratory I gives the laboratory exposure to use an operating system (Ubuntu Linux). The student will gain practical experience in handling the operating system through the graphical user interface as well as the command line interface. Additionally the installation of packages, file system understanding and changing permissions will be covered.

### *SCS 1207 - Software Engineering I*

Software Engineering I is the introductory course of Software Engineering. Along with the definitions and the need for Software engineering, the process will be explained in stages: Requirements engineering, design and implementation, testing, quality management and project management. Object oriented design concepts such as Inheritance, Classes, Objects also will be discussed.

### *ENH 1201 - Enhancement I (Communication Skills)*

The aim of this course module is to enhance the student's communication skills in general. An attention will be given to accurate the pronunciation, active listening and responding. The correct use of English grammar including nouns, verbs, conjunctions and writing skills are also focused on. The students can learn how to write applications, bio-data, resumes and professional letters.

### *SCS 1208 - Data Structures & Algorithms II*

Data Structures and Algorithms II will be built upon the first part of the module, discussing variants of the Tree data structure such as General Trees, Binary Trees, Binary search trees, AVL trees and Red Black Trees. The sorting algorithms will also be discussed further including Merge sort, Shell sort, Heap sort, etc. Further algorithms such as Hashing and Chaining and the run time complexity of algorithms also will be discussed.

### *SCS 1209 - Object Oriented Programming*

This course introduces the concepts of programming, coding algorithms in C language and the use of data structures in a C program. In addition we will look at some other concepts which were not introduced so far, such as functions, arrays, pointers, advanced input/output functions and C pre-processor. We will see also the standard libraries and how to move from C to C++. A strong emphasis is placed on the development of practical programming skills, for building software applications. The course is designed to give a sound understanding of the programming techniques, and how to get your application programs from the design phase to its implementation. The module consists of practical exercises in programming.

### *SCS 1210 - Software Engineering II*

This is an advanced course in Software Engineering which is based on Software Engineering I module and provides an understanding of Object Oriented Analysis and Design (OOAD) concepts. After completion of this course students should be able to apply OOAD to solve problems. The main topics are conceptual modelling, user stories, software processes, advanced Use Case modelling, UML diagrams, OOAD, Automated tools and technology, Model driven engineering and xUML, Reused-based Software Engineering, Component Based Software Engineering, Distributed Software Engineering, Cloud Computing and Aspect Oriented Software Engineering.

### *SCS 1211 - Mathematical Methods I*

Mathematical Methods I is the introduction to the concepts of calculus including differential equations. Real numbers, real functions, algebra of limits and algebra of derivatives, Mean value theorem, solution of Laplace's equation and related theories are discussed further.

### *SCS 1212 - Foundation of Computer Science*

This course module introduces the historic origins of computational models, mathematical theory that has led the establishment of computer science. It will discuss the theory on algorithmic problem solving, types of problems, models of computing such as instruction driven, data driven, basic automata theory and Logic and AI.

### *SCS 1213 - Probability and Statistics*

This course offers the theory and background on random variables, probability, several discrete and continuous distributions and to apply the knowledge of the distributions and the tools of probability to solve real world problems. The course is offered from the Department of Statistics, Faculty of Science, University of Colombo.

### *SCS 1214 - Operating Systems I*

This course provides an understanding of entire process within Operating Systems. It covers overview of Operating Systems, Operating System principles, concurrency, scheduling and dispatch, memory management, security and protection, virtual machines, device management and file systems.

### *ENH 1202 - Enhancement II*

Humanities is offered as a student enhancement course module, focusing on the non-technical and aesthetic subjects such as performing arts, Music, Painting, Philosophy, Literature, History etc. It will introduce various fields to the student as well as develop cross domain interests and links.

## Year 2 Courses

### *SCS 2201 - Data Structures and Algorithms III*

This is an advanced course in data structures and algorithms which is built on the fundamentals introduced in SCS 1201 and SCS 1208 to provide profound knowledge to design, use, analyze and to prove the correctness of algorithms using different techniques. The major areas covered include string matching, solving recurrences, dynamic programming, greedy algorithms and linear programming.

### *SCS 2202 - Group Project I*

This course is designed to enable students to apply the knowledge acquired through system analysis, design, development, verification and validation, maintenance and project management while working on a project to develop a real-world application. The course will be conducted throughout the academic year. Though it is designed as a group project, individual participation is also evaluated to ensure that each and every student has attempted to gather knowledge and skill in planning and developing a software solution and technical documentation.

### *SCS 2203 - Software Engineering III*

This course complements the material already covered in Software Engineering I and II courses and discusses Object-Oriented Modelling and Unified Process Models in more detail. The course also introduces advanced topics such as Software Architecture, Software Design Patterns, Agile Engineering practices and Enterprise Architecture.

### *SCS 2204 - Functional Programming*

Functional programming is becoming increasingly widespread in industry. This trend is driven by the adoption of Scala as the main programming language for many applications. In this course students will learn the elements of the functional programming style and apply them in their daily programming tasks. The course units introduce short programs that serve as illustrations of important concepts and invite you to play with them, modifying and improving them.

### *SCS 2205 - Computer Networks I*

This course is designed to provide knowledge in conceptual and technological aspects behind computer networking. The major areas include data communication, computer networks, LAN architectures, structure of Internet, Routing, IP(Internet Protocol) multicasting, IP support protocols, application layer protocols, network management and wireless LANs (Local Area Networks).

### *SCS 2206 - Mathematical Methods II*

Mathematical Methods II introduces topics such as vectors, matrices, matrix algebra, determinants, Eigenvalues and Eigenvectors and Euclidean spaces etc.

### *SCS 2207 - Programming Language Concepts*

This course provides the key features of a programming languages. It covers the areas such as programming domains, language evaluation criteria, influences on language design, implementation methods, syntax and semantics of programming languages, properties of variables, control structures, data types, sub-programs and object- oriented programming.

### *SCS 2208 - Rapid Application Development*

This course is designed to ensure the fact that the students have been provided a suitable knowledge of the core concepts of Agile practices, the Agile values and the principles, across a breadth of Agile methodologies. Hands-on exercises are included in order to enable the students to apply Agile concepts such as Scrum, Extreme Programming and Lean and Kanban. The major areas include Agile software development process, RAD (Rapid Application Development) concepts, web architectures and applications development and software process maturity models and standards.

### *SCS 2209 - Database II*

This course aims to provide introductory knowledge in advanced database concepts such as access control for secure databases, transaction management and serializability, indexing methods, writing constraints, stored procedures and triggers in SQL , object relational mapping and NoSQL databases.

### *SCS 2210 - Discrete Mathematics II*

This course is to acquaint students with basic number theory and basic combinatorial methods that provide a foundation for further studies in the field as well as for applications in related areas, in particular, computer science.

### *SCS 2211 - Laboratory II*

This course is designed to provide an understanding of how to explore and describe various real-life data sets, using R. After the completion of this course the student will be able to understand the data and use an appropriate data analysis method to meet an objective under consideration, and perform the analysis using R software. The major areas covered in the course are Descriptive Statistics, Estimation Theory and Testing, Simple Linear Regression and Correlation and Multivariate Data Display and Cluster Analysis. The course also introduces Octave, an open-source alternative to Matlab, in order to be able to perform basic mathematics and numerical computing (e.g. Linear algebra, matrix manipulations, basic statistics, polynomial curve fitting, differentiation, integration, and differential equations), simple manipulations using complex data structures and basic plotting using similar software.

### *SCS 2212 - Automata Theory*

This course mainly focus on determining a language's place in the Chomsky hierarchy and to convert among equivalently powerful notations for a language. The areas covered are Chomsky hierarchy, sets and languages, context-free languages and the halting problem.

### *SCS 2213 - Electronics and Physical Computing*

This course is organized around a series of practical hands-on exercises which introduce the fundamentals of circuits, embedded programming, signal processing, simple mechanisms, actuation, and time-based behavior. The key objective is gaining an intuitive understanding of how information and energy move between the physical, electronic, and computational domains to create a desired behavior. The exercises provide building blocks for collaborative projects which utilize the essential skills and challenge students to not only consider how to make things, but also for whom we design, and why the making is worthwhile.

### *SCS 2214 - Information System Security*

This course provides students an understanding of the fundamentals of information security in both information storage and information traveling in computer networks. This course also focuses on modern cryptographic principles in solving real world security problems.

### *ENH 2201 - Enhancement III (Entrepreneurship)*

The course is taught through a real-life customer development context where students acquire the skills and know-how to develop their business idea all the way from the conceptual stage to the marketplace. The knowledge is gained by learning success stories of local and global businesses that have been set up by entrepreneurs.

## Year 3 Courses

### *SCS 3201 - Machine Learning and Neural Computing*

This course unit consists of the following: Introduction to Machine Learning and Pattern Recognition, Learning paradigms: Supervised learning (generative/ discriminative learning, parametric/non-parametric learning, neural networks, support vector machines); Unsupervised learning (clustering, dimensionality reduction, kernel methods); Learning theory (bias/variance trade offs); Reinforcement learning and adaptive control. Boltzmann Machine, Bayesian statistics, Fuzzy Logic vs Machine Learning, Recent applications of machine learning, such as robotic control, data mining, autonomous navigation, bioinformatics, speech recognition, and text and web data processing.

### *SCS 3202 - Advanced Computer Architecture*

Processor architectures range from processors on mobile phones to smart card based ones like raspberry pi, to multi-core based personal computers and servers to massive clusters hosting Google/Amazon virtualized services. Each processor is optimised to the environment in which it works: both from an OS point and application point of view. This course examines the architectural features that are desirable to support such a range of domains, operating systems and applications.

### *SCS 3203 - Middleware Architecture*

This course provides students a fundamental concepts behind middleware and the role played by middleware in distributed systems. The course covers the basic principles of middleware and introduces the different types and uses of middleware. The functionality of middleware is taught through the practical examples and hands on design and implementation. The course also focuses on how the software industry uses middleware by having industry experts as guest lecturers during the course. It introduces different categories of middleware and how it is used in software industry.

### *SCS 3204 - Management*

After successful completion of this course students will be able to describe fundamental concepts and principles of management, including the basic roles, skills, and functions of management; discuss historical development and theoretical aspects of management; apply appropriate concepts, analytical techniques and theories used by managers when analyzing factual situations, such as case studies, involving management problems; develop solutions for management problems using appropriate concepts, analytical techniques, and theories used in the study of management; apply marketing principles, develop marketing strategies and analyze and interpret the financial statements.

### *SCS 3205 - Computer Graphics I*

This course provides an introduction to Image Processing and Computer Graphics programming. It discusses the fundamentals of computer graphics with a mathematical perspective and the basics of image processing that enables the analysis and the understanding of images by computers.

### *SCS 3206 - Graph Theory*

Under this course the following topics will be discussed. Introduction to graphs, Multigraphs, Directed graphs and Weighted graphs,Trees and distance, Network Models, Planar Graphs, Graph Coloring, Isomorphic and Homomorphic graphs, k-connected graphs, Representing graphs in computer memory.

### *SCS 3207 - Software Quality Assurance*

The course delivery is a two-hour lecture session done by course coordinators and industry experts. Industry experts invited for this course provide knowledge regarding software testing and quality control approaches that are currently used in the software development industry. Thus, students will gain both theoretical and practical knowledge about software quality assurance. This course introduces quality assurance practices applied in various stages of software projects to depict the importance of quality in relation to software systems. The teaching practices mainly introduce software testing strategies and software quality standards. Moreover, the course delivers knowledge on subject matters such as test automation frameworks, mobile application automated testing, load testing and performance testing. After the completion of the course, students will be able to explain the current trends in SQA and use these practices efficiently and effectively for their software development projects.

### *SCS 3208 - Software Project Management*

This course unit covers the following topics: Introduction to project management, Project selection, Approach selection, Project planning, Risk management, Resource allocation, Effort estimation, Optimizing the network, Financial management, Project monitoring and control, Project termination, Communication skills Quality management , Configuration management, Contract management and Human resource management

### *SCS 3209 - Human-Computer Interaction*

This course will discuss the humans, machines and how do the humans interact with machines in their day-to-day lives. Theoretical aspects of human computer interaction will be discussed and students will also get hands-on- experience in designing interfaces and systems using the theoretical knowledge that they gained. Some of the topics that will be covered in the course are Understanding human, Evolving technologies for rich interaction, Interaction Modeling and Design, User Centered Design and Developing effective prototype interfaces.

### *SCS 3210 - Systems and Network Administration*

This course introduces the technical operational tasks of a system and network administrator through both lectures and practical sessions. The course covers topics such as Linux/Unix systems, Apache configuration, DNS configuration, web caching, shell scripting, and systems administration automation.

### *SCS 3211 - Compiler Theory*

This course discusses contemporary techniques in implementation of programming language translators and provides profound knowledge on different methods in depth and techniques used to translate a programme written in a high-level language into a programme in low-level language which is more suited for machines. Lexical and syntax analysis are demonstrated using Flex and Bison as tools. The course further expands into describing topics such as symbol tables, memory organization, type checking, and optimization.

### *SCS 3212 - Mobile Application Development*

This course covers topics such as introduction, operating systems for wireless mobile devices, android overview and android development environment, anatomy of an android app and the app lifecycle, applications development for android devices with android studio, android user interface, android intents & android persistence, android web view & web services, android animation and graphics, location-based apps, sensing and sensors, hybrid mobile app development, native mobile app development, mobile testing, mobile security

### *SCS 3213 - Game Development*

This course introduces fundamental concepts of game development industry and its development process. The course expands into more details on game design principles by explaining theories in game design. The course further discusses various technologies that involve in game and game engine development. Practical sessions will enable the students to get hands-on experience in designing, prototyping, and implementing video games as a game team.

### *SCS 3214 - Group project II*

Third year group project is a mandatory course for those who follow 3 year degree programme in both CS and IS streams. The objectives of the course are to Improve the students' knowledge and to develop skills required for the software development by carrying out activities in the stages of software development lifecycle (SDLC), Develop the relevant system documentation and user documentation of the software project assigned in all stages of SDLC, Present, demonstrate and defend the working software system of the project as a group as well as an individual contributor and Demonstrate it as a completed software product ready for the deployment.

### *SCS 3215 - Professional Practice*

After completion of the course, students will be able to identify the ethical issues in the development and application of computing technology, explain ethical issues in the development and application of computing technology using ethical theories, and explain means to address ethical issues in the development and application of computing technology using ethical theories and the relevant code of conduct. Further the course debates on ways to design, develop, and apply computing technology minimizing ethical issues.

### *SCS 3216 - Research Methods*

This course discusses different approaches, methods and techniques used in scientific research in general and provides an introduction to research in computer science and information systems. The course covers three main research approaches: quantitative, qualitative and mixed method, and introduces different sampling methods and data analysis techniques. During the course the participants will engage in different types of activities such as reviewing literature, presenting research ideas and designing research studies.

### *ENH 3201 - Industry Placement/Industry Project*

The Industry Placement provides the much needed industrial exposure for the students, which is an essential part of education in order to meet Industrial standards. The Industrial Training programme is scheduled for a period of 5-6 months which improves their professionalism to make them ready for the industry. Students are placed in various sectors of the industry where they will be working as interns. The students are allowed to choose a list of interesting fields at the beginning of the programme, allowing them to work in their preferred area. The Internship programme produces quality graduates in the fields of Computer Science (CS) and Information Systems (IS).

## Year 4 Courses

### *SCS 4201 - Ethical Issues and Legal Aspects in IT*

During this course students will gain an ability to describe what the term information technology ethics means, identify various advantages and disadvantages related to the code of ethics in IT, explain the term called intellectual property and explain the protection provided by copyright, patent, and trademark and the challenges which brings from IT ethics.

### *SCS 4202 - Cognitive Robotics*

This course discusses two different approaches for developing robots: conventional artificial intelligence (AI) based approaches and new AI based approaches. The topics include an introduction to basic concepts (a short history, the concept of autonomy, dynamics and kinematics, sensors and actuators, etc.), the three robotic paradigms for organizing intelligence in robots (hierarchical, reactive/behavior-based, and hybrid deliberative/reactive), robot navigation (topological path planning, metric path planning, localization and map making, etc.), as well as the topics in new AI inspired by cognitive science such as visual routines, dual coding theory, affordances, and enactive cognition. During this course, students will not only learn about how to build a cognitive robot, but also use the robotic system as a platform to test various theories and methods from cognitive science and artificial intelligence.

### *SCS 4203 - Database III*

This is an advanced course in databases to provide in-depth knowledge on Data Storage and Querying, Query Processing and Optimization, Transaction Management, Concurrency Control Techniques, Database Recovery Techniques, Distributed Databases and some Database security aspects. SQL Collections and Records, Dynamic SQL, Input Injection, Database Encryption and Data Masking. Physical Database Design and Tuning. And also discuss topics related to current trends in databases.

### *SCS 4204 - Data Analytics*

This course constitutes two parts. Part I covers an introduction to Data Mining. It describes the Knowledge discovery process and data mining techniques. Part II consists of pattern recognition, which spans from feature selection to performance evaluations of the classifiers. Also, it gives the introduction to Big

Data Analytics. Both parts cover the theory and applications with the practical approach.

### *SCS 4205 - Computer Networks II*

This course covers topics such as vector spaces, linear codes; unicast routing, multicast routing, key based routing, mobile routing; multi-access protocols - csma and variants; wireless networks; queueing theory; data centre networks; QoS; virtualization.

### *SCS 4206 - Computer Graphics II*

The following content is covered in this course. Introduction to Virtual/ Augmented Reality Environment Technology and Applications, Graphics Pipe Line in 3D Simulations, Scene Graphs, Shaders and Graphics Programming, Physical Realism in Graphical Simulations, Collision Detection, 3D User Interfaces and Interaction Design, Spatial Data Structures, Game Design, Game Programming, Game AI.

### *SCS 4207 - Image Processing & Computer Vision*

This course covers topics such as Image Characterization: Introduction to Image Processing and Computer Vision, Digital Image Representation, Color Theory; Spatial Domain Image Processing: Transformation and Histogram based Techniques, Filter based Techniques; Frequency Domain Image Processing: Frequency Domain Techniques; Special Topics in Image Processing: Image Restoration, Edge and Line Detection; Computer Vision: Image Segmentation, 3D reconstruction, Recognition, Computational Photography.

### *SCS 4208 - Theory of Computation*

This course covers topics such as DFA, NDFA; regular languages, context free grammars, pumping lemma, pushdown automata; computational complexity, P, NP, EXP classes; halting problem, Turing machines; Lambda and Pi calculi.

### *SCS 4209 - Natural Language Processing*

Natural Language Processing, also referred to as Computational Linguistics is the fascinating field of building computational models of Human Language and brings together the fields as diverse as Linguistics, Mathematics, Psychology, Statistics and Computer Science. This course includes relevant materials in Linguistics and Computer Science and it is designed to cover the background knowledge required to develop NLP related applications.

### *SCS 4210 - Parallel Computing*

This course is designed to introduce students to parallel computing. As Pre-requisites to the course knowledge of C is desired although not essential. As learning outcomes, students will gain the skills to develop high performance parallel programs. Syllabus of the course contains serial and Parallel Programs, Basic Serial Performance Optimization Guidelines, hardware for Parallel Computing, Parallel Program Design, Software for Parallel Computing: MPI, Pthreads, OpenMP; Cuda Optimizing Parallel Programs.

### *SCS 4211 - Research Seminar*

The research seminar course introduces students to research communication, evaluation and presentation culture. The expectation of this course module is to continually enhance the quality (critical thinking, analysis, evaluation & presentation in research) of the students by presenting/discussing research conducted in myriad of fields within the domain of computer science.

### *SCS 4212 - Formal Methods and Software Verification*

This course provides a hands-on introduction to formal methods and software verification. The aim of this course is to teach knowledge and skills in, and judgement about, two important styles of formal methods for reasoning about software: deductive verification and model checking. Each style will be introduced in three ways: conceptual, theoretical, and practical, using particular tools. The course builds on skills in first-order logic and temporal logic and shows how these formalisms can be applied, and extended, for the verification of software.

### *SCS 4213 - Digital Forensics*

With the profound usage of digital media and its connectivity to cyber space, cyber crime incidents are enormously increasing in numbers. Thus, contemporary world demands practitioners who are skilled in protecting the assets in cyber space and investigating cyber crimes in incident scenarios. The field of computer forensics specifically focuses the investigation aspect of a cyber crime and hence, SCS 4213 Computer Forensics course module provides a broad understanding of the field by discussing topics such as systematic approaches in investigation, incident management, fundamentals of forensic investigation, legal aspects and more.

### *SCS 4214 - Natural Algorithms*

This course covers topics such as Introduction; Sorting, Shortest Path, Travelling Salesman Problem; Evolutionary Computing: Genetic Algorithms (GA), Genetic Programming (GP), Genetic Based Machine Learning (GBML); Swarm Intelligence: Particle Swarm Optimization (PSO); Foraging Algorithms: Ant Colony Optimization (ACO), Bees Algorithm (BA), Cockroach Algorithm (CA); Artificial Immune Systems (AIS), Emerging Trends.

### *SCS 4215 - Computational Biology*

After successful completion of the course students should be able to: Explain the necessary principles and methods of genomics, gene expression and proteomics show how popular bioinformatics algorithms work. Design algorithms that solve biological problems. Plan experiments; identify appropriate techniques/ methods to analyze large/heterogeneous biological datasets; interpret results and draw conclusions. Evaluate; criticize a piece of work in Computational Biology. Recognize the future and trends in computational Biology.

### *SCS 4216 - Advanced Topics in Mathematics*

This course is to acquaint students with basic combinatorial methods and theories that provide a foundation for further studies in the field as well as for applications in related areas, in particular computer science. This course covers the most elementary techniques in combinatorics such as pigeonhole principle, inclusion-exclusion principle, recurrence relations and generating functions.

### *SCS 4217 - Embedded Systems*

This course gives a technological and scientific perspective of embedded systems. The topics include introduction (e.g., typical components of an embedded system and application areas), embedded programming languages (e.g., programming FPGA using Verilog/VHDL, programming PIC microcontrollers using Assembly and C, and Arduino programming), embedded communication technologies (e.g., serial interfaces like I2C, SPI, UART, and 1-Wire, parallel bus interfaces, and wireless interfaces like RF, Bluetooth, Wi-Fi, ZigBee, and GPRS), technologies and protocols for creating Wireless Ad-hoc Sensor Networks (e.g., ad-hoc routing, data and power management, security, and hardware platforms such as XBee and ESP8266), and engineering approaches (e.g., flow charts, DFDs, state machines, timed-automata and UPPAAL for verification, quality and certification, and human factors). Students are required to do laboratory practical as part of the course.

### *SCS 4218 - Operating Systems II*

After completing this course the student will be able to use well established advanced concepts as well as recent advancements in operating systems to solve problems related to computer systems. First part is based on the Xv6 operating system and the Operating Systems Engineering course on MIT OCW. This provides hands-on experience on implementing/modifying, System calls, File systems, Device drivers, Shells & Communication abstractions (pipes etc.) The second part is based on Virtualization, Real-time operating systems & Micro kernels.

### *SCS 4219 - Distributed Systems*

This course covers Leader election, consensus, byzantine agreement, atomic commit, logical clocks, snapshots, broadcast variants, memory consistency models, Lamport registers, paxos, software transactional memory, CAP theorem and large scale systems, Cassandra, Zookeeper, Spanner.

### *SCS 4220 - Data Structures and Algorithms IV*

This course module provides an understanding of specialized areas in the study of algorithms and gives the ability to analyze amortized cost and randomized running time complexities. It covers Amortized Analysis, Application of Amortized Analysis, Randomized Algorithms, Concurrent Algorithms I, II and III, Computational Geometry I, II and III.

### *SCS 4221 - Software Engineering IV*

Software Engineering IV is intended for advanced learners who wish to specialize in software engineering sub-discipline of Computing. The course is a blended learning course where there will be at least two-hour interaction in the classroom done by industry experts, course coordinators and online learning activities. This course introduces advanced software development models and software architectures which are essentially incorporated in the industry to build large-scale, complex software systems. Furthermore, the course discusses patterns and best practices that are used to solve commonly arising problems in the software lifecycle. The course includes theoretical details of underlying principles that are the essence of computing in the Cloud.

### *SCS 4222 - Logic Programming*

This course discusses the logic programing paradigm through PROLOG. It introduces the syntax and semantics of propositional and predicate logic, presents the syntax and semantics of PROLOG and explores in detail the procedural aspects of PROLOG using UNIFICATION and BACKTRACKING. It analyzes and optimizes the PROLOG search space in writing PROLOG program.

### *SCS 4225 - Philosophy of Science*

This course is designed to provide a basic introduction to the main philosophical questions concerning scientific knowledge. It is specifically designed to generate an interest on epistemological concerns in research among the students who follow undergraduate courses on non-humanities subject streams. The key focus of this unit is on ideas, concepts, and thoughts that shape the nature, agenda and goal of scientific inquiry. Therefore, it provides a brief historical account on the main debates that emerged in philosophy of science since the seventeenth century. This aims to broaden the thinking of students in order to prepare them for serious academic research. The course will span over 15 lecture hours and the students' performance will be evaluated during the lectures as well as at the end of the semester. The students will be provided with reading material and useful online material to help them to follow the course successfully. Following are the key themes covered in this course.

### *SCS 4226 - Intelligent Systems*

Philosophy of AI, Search (Heuristic/Adversarial/Informed/Uninformed Search), Knowledge Representation and Reasoning, CommonKADs, Planning, Learning, Introduction to NLP and Linguistics, Intelligent Agents, Semantic Web, Emerging Trends.

### *SCS 4223 - Final Year Project in Software Engineering*

This final year project course is designed to support the students following the honours degree programme in Software Engineering to focus on the development of software products and their entire life cycle. During the course the students will develop software products using the models and theories developed as independent research in other disciplines such as CS and IS. It is always important to remember that in any SE project the outcomes should be visible in the form of a working product. This spans both semesters of the year. The projects could be conducted in groups of 3 to 4 students. The project activities should be carried out according to the schedule provided in the

Undergraduate Virtual Learning Environment (UGVLE) and the progress of the project should be reported to the course coordinator fortnightly.

### *SCS 4224 - Final Year Project in Computer Science*

Final Year Project in Computer Science (SCS 4224) is a part requirement for the award of BSc (Hons) in Computer Science degree at the University of Colombo School of Computing (UCSC). The project provides the student with an opportunity to design and conduct an independent piece of research or study related to the discipline of Computer Science (CS) under the guidance of a supervisor in his/her final year of undergraduate study.

# INFORMATION SYSTEMS DEGREE PROGRAMME

The Information Systems (IS) degree programme originates from the Information and Communication Technology (ICT) degree programme which was introduced in year 2004. After a curriculum revision based on the ACM guidelines, IS Degree programme was introduced in year 2012.

The IS degree programme is designed to prepare students to be IT professionals who possess the necessary skills and knowledge in analysing and understanding business problems and applying information technology to solve these problems. The students will learn how to analyse client needs, define systems to meet these needs, develop applications, manage operations and act as technical intermediaries between management and other technical staff.

The high level learning outcomes of the IS degree programme are;

- Improving organizational processes
- Exploiting opportunities created by technology innovations
- Understanding and addressing information requirements
- Designing and managing enterprise architecture
- Identifying and evaluating solution and sourcing alternatives
- Securing data and infrastructure
- Understanding, managing and controlling IT risks

Please refer page 109 for the degree awarding criteria.

## INFORMATION SYSTEMS DEGREE STREAM

The meaning of digits and symbols used in the course tables:

| | |
|---|---|
| Lecture 1/2 | One or Two hours lecture per week during the semester |
| Practical 1/2 | One or Two hour practical sessions per week during the semester |
| X | Compulsory Course |
| O | Optional Course (Student has to register) |
| * | Offered throughout the year |

***YEAR 1*** *(All Compulsory)*

| Semester | Course Code | Course Name | Credits | |
|---|---|---|---|---|
| | | | Lecture | Practical |
| 1 | IS 1101 | Programming and Problem Solving | 2 | 1 |
| 1 | IS 1102 | Computer Systems | 2 | - |
| 1 | IS 1103 | Information Systems Management | 2 | - |
| 1 | IS 1104 | Applications Laboratory | 1 | 1 |
| 1 | IS 1105 | Introduction to Management | 2 | - |
| 1 | IS 1106 | Discrete Mathematics | 2 | - |
| 1 | IS 1107 | Interactive Media Design | 2 | 1 |
| 1 | EN 1101 | Enhancement I (Business Communication) | 1 | - |
| 2 | IS 1108 | Financial Accounting | 1 | 1 |
| 2 | IS 1109 | Programming for Web Application Development | 2 | 1 |
| 2 | IS 1110 | Database Management | 2 | - |
| 2 | IS 1111 | Software Engineering | 2 | 1 |
| 2 | IS 1112 | Probability and Statistics | 1 | - |
| 2 | IS 1113 | Organizational Behavior and Society | 1 | - |
| 2 | IS 1114 | Data Structures and Algorithms I | 2 | 1 |
| 2 | IS 1115 | Fundamentals of Economics | 1 | - |
| 2 | EN 1102 | Enhancement II | 1 | - |

| ***YEAR 2*** *(All Compulsory)* | | | | |
|---|---|---|---|---|
| Semester | Course Code | Course Name | Credits | |
| | | | Lecture | Practical |
| 1 | IS 2101 | System Analysis and Design | 2 | - |
| 1 | IS 2102 | Group Project I* | - | 4 |
| 1 | IS 2103 | Digital Marketing | 2 | - |
| 1 | IS 2104 | Rapid Application Development | 2 | 1 |
| 1 | IS 2105 | Business Statistics | 2 | 1 |
| 1 | IS 2106 | Business Process Management | 2 | - |
| 1 | IS 2107 | Graphic and Visualization | 1 | 1 |
| 2 | IS 2108 | IT Project Management | 2 | - |
| 2 | IS 2109 | Information Systems Security | 2 | 1 |
| 2 | IS 2110 | Data Structures and Algorithms II | 2 | - |
| 2 | IS 2111 | Computer Networks | 2 | 1 |
| 2 | IS 2112 | e-Business Strategies | 2 | - |
| 2 | IS 2113 | Community Informatics (ICT for Developments) | 2 | - |
| 2 | IS 2114 | Business Process Re-engineering | - | 2 |
| 2 | EN 2102 | Enhancement III (Entrepreneurship) | 1 | - |

| YEAR 3 | | | | | | |
|---|---|---|---|---|---|---|
| Semester | Course Code | Course Name | BSc in IS | BSc Honours in IS | Credits | |
| | | | | | Lecture | Practical |
| 1 | IS 3101 | Enterprise Resource Planning Systems | X | X | 2 | - |
| 1 | IS 3102 | Human Computer Interaction | X | X | 2 | 1 |
| 1 | IS 3103 | Software Quality Assurance | X | X | 1 | 1 |
| 1 | IS 3104 | Strategic Management | O | O | 2 | - |
| 1 | IS 3105 | Professional Practice | X | X | 2 | - |
| 1 | IS 3106 | IT Procurement Management | O | O | 2 | - |
| 1 | IS 3107 | Contingency Planning and Risk management | O | O | 2 | - |
| 1 | IS 3108 | Middleware Architecture | O | O | 2 | 1 |
| 1 | IS 3109 | Systems and Network Administration | O | O | 2 | 1 |
| 1 | IS 3110 | Research Methods | O | X | - | 2 |
| 1 | IS 3111 | Operations Research | O | O | 2 | - |
| 1 | IS 3112 | Game Development | O | O | 1 | 2 |
| 1 | IS 3113 | Group Project II | X | - | - | 3 |
| 1 | IS 3114 | Enterprise Applications | X | X | 2 | - |
| 1 | IS 3115 | Mobile Application Development | O | O | 2 | 1 |
| 1 | IS 3116 | Database Management Systems II | O | O | 2 | - |
| 1 | IS 3117 | Machine Learning and Neural Computing | O | O | 2 | - |
| 1 | IS 3118 | E-Learning and Instructional Design | O | O | 2 | - |
| 2 | EN 3101 | Industrial Placement | X | X | - | 8 |

| YEAR 4 | | | | | |
|---|---|---|---|---|---|
| Semester | Course Code | Course Name | Mode | Credits | |
| | | | | Lecture | Practical |
| 1 | IS 4101 | Final Year Project in Information Systems* | X | - | 8 |
| 1 | IS 4102 | Advanced Software Quality Assurance | X | 1 | 1 |
| 1 | IS 4103 | Data Analytics | O | 2 | 1 |
| 1 | IS 4104 | Research Seminar | X | - | 2 |
| 1 | IS 4105 | Advanced Concepts in Software Design and Development | O | 2 | 1 |
| 1 | IS 4106 | Advanced Database Management | O | 2 | 1 |
| 1 | IS 4107 | Ethical Issues and Legal Aspects of IT | O | 1 | - |
| 1 | IS 4108 | Natural Language Processing | O | 2 | 1 |
| 1 | IS 4109 | Cognitive Robotics | O | 1 | 1 |
| 1 | IS 4110 | Parallel Computing | O | 2 | 1 |
| 2 | IS 4111 | Computational Biology | O | 2 | 1 |
| 2 | IS 4112 | Geographical Information Systems | O | 1 | 1 |
| 2 | IS 4113 | Digital Forensics | O | 2 | - |
| 2 | IS 4114 | IS Innovation | X | 2 | - |
| 2 | IS 4115 | Enterprise Architecture | O | 2 | - |
| 2 | IS 4116 | Business Intelligence Systems | X | 2 | - |
| 2 | IS 4117 | Intelligent Systems | O | 2 | - |
| 2 | IS 4118 | Embedded Systems | O | 2 | 1 |
| 2 | IS 4119 | Philosophy of Science | X | 1 | - |

## MEDALS AND AWARDS FOR INFORMATION SYSTEMS

These are several awards at the Annual Convocation for the graduates with respect to the degree programme.

| | Candidates | Name of the Award |
|---|---|---|
| Best performance (Highest GPA) | 3rd Year Graduates | *Zebra Technologies Excellence Award* |
| | 4th Year Graduates | *IFS Academic Excellence Award* |
| Best Industrial Training (Awarded for Best Result at Industrial Training in 3rd Year) | 3rd /4th Year Graduates | *David Pieris Group Gold Medal* |
| Best Final year Project/ Research | 4th Year Graduates | *Sampath Bank Award* |
| Most Outstanding Graduate of the UCSC (Combined award for CS and IS) | 4th Year Graduates | *Prof. V K Samaranayake Award* |

# INFORMATION SYSTEMS COURSE DESCRIPTIONS

## Year 1 Courses

### *IS 1101 - Programming and Problem Solving*

In this course, the student will learn how programming languages are used to solve real-world problems. Students will be introduced to programme design, development approaches, object-oriented, procedural, declarative, rapid application, techniques for modelling programme structures algorithms, flowcharts, pseudo-codes and hand traces. Further programming concepts, variables, literals, primitive data types, expressions, procedures, functions, parameters, operators and operations, decision logic selection, simple selection, multiple selection, looping, break, continue subprocedures, passing parameters, coding, unit testing, control structure, sequential, conditional, recursion, file handling, access databases and problem-solving application will be discussed. As a good, yet powerful programming language to start with, C programming language is practically utilized for real-world problems.

### *IS 1102 - Computer Systems*

In this subject the student will be taught to be able to describe the basic operations of a computer, be able to design simple logic circuits and be able to describe how to install, configure, maintain and troubleshoot a computer system at the end of the course. Throughout the course students will learn History of the computer systems, Data representation, Logic Operation, Logic Circuit Design, Inner workings of the CPU and Memory Components and Organization.

### *IS 1103 - Information Systems Management*

This course aims to broaden the students' comprehension of the role of information systems and technology (IS/T) in businesses around the world. This course covers the modules of IS strategic alignment, IT/IS investment evaluation and performance evaluation, IS leadership and human resource management, acquiring IT architecture, IS resources and capabilities and using IS/IT governance frameworks. During the course, the students will get an opportunity to interact with IT professionals with specialist knowledge in the field. The students will learn by actively engaging in activities in both physical and virtual learning environments.

### *IS 1104 - Applications Laboratory*

On successful completion of this course, students should be able to navigate the Linux environment using the command line, to explain how to set permissions using the command line, to create and modify directory structures on Linux, to create an HTML page using the vi/vim editor, to explain how to install Linux and configure the hardware and to create documents and charts with an Office application.

### *IS 1105 - Introduction to Management*

After the successful completion of this course students will be able to apply management theories and practices in the decision making process, to Identify the skills needed by managers and managerial roles, to Analyse any company using business analysis tools, to Analyse industry situations, to Develop Business Strategies, to Recognize the importance of leadership qualities and motivation theories, to Develop marketing Strategies based on marketing principles and to Apply Economic Principles in day to day Business Operations. The course content will be consist of the topics on Evolution of Management, Managerial Roles & Skills, Management Process, Organizational Structure & Behaviour, Motivation & Leadership Marketing, Business Analysis, SWOT, PEST and Porter's Forces Analysis, Business Strategy Development, Managerial Economics.

### *IS 1106 - Discrete Mathematics*

The aim of this course is to provide basic mathematical and statistical concepts of numbers and arithmetic; basic algebra; solving quadratic and simultaneous equations; fundamentals of measurement; ratios and proportions; indices and logarithms; percentages and interest rates; time related problems; permutations and combinations; sets, logic and truth tables; relations and functions; basic statistics; introduction to probability; and sequences and series.

### *IS 1107 - Interactive Media Design*

This course introduces the principles of interactive media design and teaches how to apply a structured approach for multimedia development to the creative development of a complete multimedia project.

### *EN 1101 - Enhancement I (Business Communication)*

This course provides the students a conceptual framework and specific tools to communicate in academic and business environments by training them in writing, oral and collaborative skills necessary for future business courses, internships and professional positions.

### *IS 1108 - Financial Accounting*

After successful completion of this course students should be able to discuss the concepts, principles, and procedures of accounting Interpret main financial statements and their advantages and limitations, Analyze financial statements to make financial decisions and prepare financial statements using computer based accounting packages.

### *IS 1109 - Programming for Web Application Development*

This course mainly covers the web application development techniques; client-side (HTML, JavaScript, CSS) and server-side programming (PHP, MySQL database connection) improving students' skills and project-based experience needed for web design and development of the careers using a variety of strategies and tools. Further it intends to make students aware on World Wide Web (WWW), HTML editors for website development, solution stacks (LAMP, XAMP and WAMP), 3-tier architecture, web servers, website hosting and Internet Service Providers (ISP).

### *IS 1110 - Database Management*

After the successful completion of this course students should be able to understand the role of a database system and the functions of a database administrator, understand the three-schema architecture for databases and thus the difference between conceptual, external and physical schemas, understand the database application development process, understand SQL as a data definition language, data manipulation language and access control language and understand how to develop a database application.

### *IS 1111 - Software Engineering*

IS 1111 provides a broad understanding of the software engineering process, concepts, the systematic development and management of software projects. This course covers the modules of software design process models; requirements engineering; design principles; coding practices; testing strategies; software maintenance and evolution; software project management and fundamentals

of software quality assurance.

### *IS 1112 - Probability and Statistics*

The main aim of this course is to provide a range of skills and knowledge in Probability and Statistics to form the theoretical background required for practical applications of Statistics. It commences with an introduction to statistics and basic concepts, followed by measures of location and dispersion, probability theory, conditional probability, Bayes' theorem, discrete probability distributions and continuous probability distributions. The course is offered by the Department of Statistics, Faculty of Science, University of Colombo.

### *IS 1113 - Organizational Behavior and Society*

At the completion of the course, the student should be able to explain the terminology associated with organizational behavior, understand the systems approach as applied to human and organizational behavior, gain knowledge of contemporary issues and approaches to the organizational change facing organizations and apply organizational behavior approaches to the analysis of one organization's initiative(s).

### *IS 1114 - Data Structures and Algorithms I*

Data Structures and Algorithms I introduces different data structures used in programming such as lists, stacks, queues, several types of linked lists and graphs and their applications and implementation. Also related with the data structures discussed algorithms such as Bubble sort, Linear insertion, Selection sort, Merge, Shell, Heap, Quick, Straight Radix, and Radix Exchange sort and analysis of algorithms are also explained.

### *IS 1115 - Fundamentals of Economics*

After the successful completion of this course students should be able to comprehend and relate core economic concepts such as opportunity cost, the role of the market, different market structures, and the connections between economic agents and economic activities. The course content will consist of topics of Demand, Supply and Equilibrium, Consumer and Producer Surplus and Government Intervention, The Theory of Consumer Behaviour, The Theory of Production and Cost of Production, Market Structures and Optimization, Macroeconomic Problems, Introduction to Exchange Rate Determination and Introduction to Balance of Payment.

### *EN 1102 - Enhancement II*

On completion of this course, students will be able to identify various fields within the domain of humanities, understand different aspects of the fields within the domain of humanities, create relationships between ICT and different fields within the domain of humanities and develop cross domain research ideas that can be explored later in the degree programme. Guest lectures will be done by the professionals in the field of Performing arts, Music, Art & painting, Philosophy, Psychology, Sociology, Literature, Cinematography, History, Archaeology and political science.

## Year 2 Courses

### *IS 2101 - System Analysis and Design*

After successful completion of this course students should be able to describe fundamental concepts and trends that provide the context of Systems Analysis and Design methods and to apply the techniques practically to analyze and design an information system, Describe Object Oriented Analysis and Design concepts and apply them to solve problems and prepare Object Oriented Analysis and Design (OOAD) documents for a given problem. The main topics are Conceptual modelling, Use Case modelling, UML diagrams, OOAD, Software process models, Software Processes, Automated tools and technology, Model driven engineering and xUML

### *IS 2102 - Group Project I*

This course is designed to enable students to apply the knowledge acquired through system analysis, design, development, verification and validation, maintenance and project management while working on a project to develop a real-world application. The course will be conducted throughout the academic year. Though it is designed as a group project, individual participation is also evaluated to ensure that each and every student has attempted to gather knowledge and skill in planning and developing a software solution and technical documentation.

### *IS 2103 - Digital Marketing*

Digital marketing course mainly provides a detailed view of traditional marketing concepts and digital marketing concepts. Emphasis will be placed

on the practical applications of these marketing concepts and various digital marketing tools and techniques. This course offers knowledge on marketing concepts, marketing mix, STP model, consumer psychology, customer relationship management, marketing strategies, developing a marketing plan and budget, marketing information system, digital marketing concepts, marketing automation, e-marketing segmentation, e-marketing plan, digital marketing strategies and techniques and real-world applications of these concepts. After successful completion of this course, students will be able to understand the importance of marketing concepts, apply these concepts in real world problems and come up with innovative solutions.

### *IS 2104 - Rapid Application Development*

This course is designed to ensure the fact that the students have been provided a suitable knowledge of the core concepts of Agile practices, the Agile values and the principles, across a breadth of Agile methodologies. Hands-on exercises are included in order to enable the students to apply Agile concepts such as Scrum, Extreme Programming and Lean and Kanban. The major areas include Agile software development process, RAD (Rapid Application Development) concepts, Java applications development and software process maturity models and standards.

### *IS 2105 - Business Statistics*

IS 2105 concentrates on the practice of statistics and through this course students will develop: a mature awareness of the nature and value of statistics, including its ability to draw meaningful conclusions in the face of uncertainty; interest and aptitude in applying this area of mathematics for the issues from many areas of human inquiry; the ability to perform accurate calculations and evaluations using tools and techniques from probability, descriptive statistics, statistical estimation, statistical distribution, inferential statistics, correlation, and regression; a sound, critical approach to interpreting statistics, including an awareness of both the legitimate uses and possible misuses of statistical information; an ethical perspective concerning the practice of statistics; facility with one or more statistical software package; and proficiency in the art of clearly presenting mathematical information, in both written and oral form.

### *IS 2106 - Business Process Management*

This course aims firstly, to establish the theoretical base of business process management which include (but not limited to), core elements and types of business processes and the stages of the business process life cycle as noted in "Fundamentals of Business Process Management" by Marlon Dumas, Marcello

La Rosa, Jan Mendling, Hajo A. Reijers. Secondly, the students are exposed to case studies and practical scenarios for each stage of the above cycle, focusing on the potential of IT to support business process management.

### *IS 2107 - Graphic and Visualization*

This course provides an introduction to Graphics & visualization. It discusses the fundamentals of computer graphics with a mathematical perspective and various visualization techniques of data.

### *IS 2108 - IT Project Management*

IS 2108 covers the modules of introduction to project management by defining the characteristics of a project and the life cycle of an IT project; identifying and planning activities and understanding activity planning objectives and methods; importance of Software effort estimation (SEE) and how to estimate effort of a given scenario using SEE techniques; managing risks in IT projects-steps in risk management process; types of risks and risk planning; nature of resources in IT projects and how to schedule and allocate resources; how to effectively monitor and control a project and importance of ensuring software quality and methods to adopt.

### *IS 2109 - Information Systems Security*

IS 2109 facilitates students providing them the ability of describing the nature of security risk in a business and its content; compare and apply several models for security risk assessment; facilitate a risk assessment process and gain consensus on risk-based decisions; incorporate risk assessment into an IT security plan and describe various protection measures including cryptographic approaches covering main course modules; security goals, cryptography, social engineering and risk assessment methodologies and techniques.

### *IS 2110 - Data Structures and Algorithms II*

This course is designed to enhance the knowledge gained on IS 1114 - Data Structures and Algorithms I by introducing more data structures, algorithms and algorithm design techniques. Related with data structures, graphs, balanced trees and hash tables will be introduced. Divide and conquer (e.g merge sort), greedy, recursive algorithms and memorization are introduced under algorithm design techniques. Graph traversal algorithms (DFS, BFS), shortest path and minimum spanning tree algorithms are also explained under this course.

### *IS 2111- Computer Networks*

IS 2111 facilitates students by providing them the ability of explaining the principles underlying the layered systems architectures and their application in computer networks; describe the functionality and the role of different hardware and software components used in networks; and apply the core concepts underlying IP networks to solve simple network design problems, including IP subnetting covering the modules of types of networks, core network components, TCP/IP model, physical layer: wired and wireless connectivity, data link layer: Ethernet, network layer: IP, IP addressing and routing, transport layer: TCP, application layer: core Internet application protocols, network security and security devices, the Internet as a key networking platform and network device configuration.

### *IS 2112 - e-Business Strategies*

IS 2112 provides a sound understanding of the applications and technologies in e-Business, and familiarizes the student with the concepts in e-Business, the Business applications, marketing on the web, the new revenue models, legal issues related to B2C (Business to Consumer) and B2B (Business to Business) applications. Further it prepares students with the skills needed to work in any e-Business environment and to decide on strategic business decisions related to e-Business. While making the students understand ethics and professional issues in an e-Business environment it prepares them to work in an e-Business environment in the global market. Moreover this course is supposed to enhance the ability of students of taking a company through the e-Business Transformation process.

### *IS 2113 - Community Informatics (ICT for Development)*

The aim of this module is to introduce students to the fundamental concepts and discourse of the ICT4D and Community Informatics field. Focus is placed on application of concepts and theories associated with these fields to enable design of projects using ICT to achieve sustainable economic and/or social development. Students will learn to: Describe the concepts of Development; Analyse the role of ICTs in development (emphasis is placed on socio-economic development within the context of e-Government as well as other ICT4D projects and reflect on its appropriateness); Describe the challenges and issues arising with the application of ICTs for development; Analyse the role of national policy and regulations in promoting effective developmental use of ICTs; Design community informatics/ ICT4D projects using ICT and Evaluate ICT4D/Community Informatics projects.

### *IS 2114 - Business Process Re-engineering*

This course is directed at exposing students to the practical components of the Business process management cycle, which is taught in the IS 2006 course, with a main focus to the re-engineering aspect of business processes. Students are required to participate in industry visits to selected organizations and to identify and document selected business processes. Then they are required to propose re-engineering initiatives/enhancements for the identified processes, and prepare a report and presentation on the same.

### *EN 2102 - Enhancement III*

The course is taught through a real-life customer development context where students acquire the skills and know-how to develop their business idea all the way from the conceptual stage to the marketplace. The knowledge is gained by learning success stories of local and global businesses that have been set up by entrepreneurs.

## Year 3 Courses

### *IS 3101 - Enterprise Resource Planning Systems*

This course offers an introduction to business functions and business processes along with a comprehension of the concept of Enterprise Resource Planning system. It also provides knowledge on tactics, tools, metrics and methodologies available for implementing an ERP system as well as the knowledge on common pitfalls of an ERP system.

### *IS 3102 - Human-Computer Interaction*

This course will discuss the humans, machines and how do the humans interact with machines in their day-to-day lives. Theoretical aspects of human computer interaction will be discussed and students will also get hands-on-experience in designing interfaces and systems using the theoretical knowledge that they gained. Some of the topics that will be covered in the course are Understanding human, Evolving technologies for rich interaction, Interaction Modeling and Design, User Centered Design, Developing effective prototype interfaces.

### *IS 3103 - Software Quality Assurance*

Software Quality Assurance is offered for third-year students at the University of Colombo School of computing. The course delivery is a two-hour lecture session done by course coordinators and industry experts. Industry experts invited for this course provide knowledge regarding software testing and quality control approaches that are currently used in the software development industry. Thus, students will gain both theoretical and practical knowledge about software quality assurance. This course introduces quality assurance practices applied in various stages of software projects to depict the importance of quality in relation to software systems. The teaching practices mainly introduce software testing strategies and software quality standards. Moreover, the course delivers knowledge on subject matters such as test automation frameworks, mobile application automated testing, load testing and performance testing. After the completion of the course, students will be able to explain the current trends in SQA and use these practices efficiently and effectively for their software development projects.

### *IS 3104 - Strategic Management*

This course addresses the strategic management of organisations, including the formulation of longer term strategic directions, the planning of objectives and supporting strategies, and the control of strategic implementation. It provides students an understanding of the approaches and the tools for planning and controlling strategy of the organisation and sub-unit levels, as well as experience in case analysis and practical application of planning and controlling skills. Topics covered by this course include evaluating the strategic environment, industry and competitive analysis, formulating mission and setting objectives, strategy selection and implementation, and strategic control.

### *IS 3105 - Professional Practice*

After the completion of this course, students will be able to identify ethical issues in the development and application of computing technology, will be able to explain ethical issues of the development and application of computing technology using ethical theories, and explain means to address ethical issues in the development and application of computing technology using ethical theories and the relevant code of conduct. Further the course debates on ways to design, develop, and apply computing technology to minimize ethical issues.

### *IS 3106 - IT Procurement Management*

IS 3106 covers the modules of public procurement; IT procurement management; procurement categories (goods, works, services, consultancy and information system); methods of selection of goods and services; methods of selection of information systems; methods of selection of consultancy; difference between methods of selection; Invitation for Bid (IFB); Expression of Interest (EOI) and Request for Proposal (RFP); Terms of Reference (TOR); contract management and e-Government procurement.

### *IS 3107 - Contingency Planning and Risk Management*

IS 3107 develops a facet of soft skills needed to address information systems assurance. The body of required knowledge stems from the emphasis by the top management of organizations on information systems security. The exposure given through practical and theoretic means strives to provide the expertise needed in terms of technical knowhow coupled with understating of business required to influence a business decision in driving information systems security and assurance.

### *IS 3108 - Middleware Architecture*

This course provides students with a fundamental concepts behind middleware and the role played by middleware in distributed systems. The course covers the basic principles of middleware and introduces the different types and uses of middleware. The functionality of middleware is taught through practical examples and hands on design and implementation. The course also focuses on how the software industry uses middleware by having industry experts as guest lecturers during the course. This also introduces different categories of middleware and how it is used in software industry.

### *IS 3109 - Systems & Network Administration*

This course introduces the technical operational tasks of a system and network administrator through both lectures and practical sessions. The course covers topics such as Linux/Unix systems, Apache configuration, DNS configuration, web caching, shell scripting and systems administration automation.

### *IS 3110 - Research Methods*

This course discusses different approaches, methods and techniques used in scientific research in general and provides an introduction to research in computer science and information systems. The course covers the three

main research approaches: quantitative, qualitative and mixed method and introduces different sampling methods and data analysis techniques. During the course, the participants will engage in different types of activities such as reviewing literature, presenting research ideas and designing research studies.

### *IS 3111 - Operations Research*

After the successful completion of this course students will acquire the skills to improve the effectiveness of a system as a whole, with emphasis on allocation of scarce resources. Students will learn to use appropriate quantitative techniques and tools including mathematical models to solve problems in the real world. The topics covered include Introduction to Operations Research, Linear Programming Models, Graphical solution, Simplex algorithm, Sensitivity Analysis, Transportation models, Queuing models and inventory models.

### *IS 3112 - Game Development*

This course introduces fundamental concepts of game development industry and its development process. The course expands more detail on game design principles by explaining theories in game designing. The course further discusses various technologies that involve in game and game engine development. Practical sessions enable students to get hands-on experience in designing, prototyping, and implementing video games as a game team.

### *IS 3113 - Group Project II*

The third year group project is a mandatory course for those who follow 3 year degree programme in both CS and IS streams. The objectives of the course are to Improve the students' knowledge and to develop skills required for the software development by carrying out activities in the stages of software development lifecycle (SDLC), to Develop the relevant system documentation and user documentation of the software project assigned in all stages of SDLC, to Present, to demonstrate and to defend the working software system of the project as a group as well as an individual contributor and to Demonstrate it as a completed software product ready for the deployment.

### *IS 3114 - Enterprise Applications*

This course aims to extend the enterprise applications/software knowledge of Enterprise Resource Planning (ERP) systems course into Supply chain management (SCM) and Customer relationship management (CRM) areas of business organizations. In relation to both core aspects (SCM and CRM) of the course, up to date theoretical content (covering current trends in the industry)

and technologies will be delivered to the students. The ultimate aim of the course is to enable students build a holistic view of business organizations through linked business processes using the above integrated business applications.

### *IS 3115 - Mobile Application Development*

This course covers topics such as Introduction, operating systems for wireless mobile devices, android overview and android development environment, anatomy of an android app and the app lifecycle, applications development for android devices with android studio, android user interface, android intents & android persistence, android web view & web services, android animation and graphics, location-based apps, sensing & sensors, hybrid mobile app development, native mobile app development, mobile testing, mobile security.

### *IS 3116 - Database Management Systems II*

This course is designed to enhance the knowledge gained on database management under IS 1110. The course consists of data modeling techniques, introduction to indexing, transaction management concepts, integrity validation techniques, triggers, stored procedures and database security techniques.

### *IS 3117 - Machine Learning and Neural Computing*

This course unit consists of the following: Introduction to Machine Learning and Pattern Recognition, Learning paradigms: Supervised learning (generative/ discriminative learning, parametric/non-parametric learning, neural networks, support vector machines); Unsupervised learning (clustering, dimensionality reduction, kernel methods); Learning theory (bias/variance tradeoffs); Reinforcement learning and adaptive control. Boltzmann Machine, Bayesian statistics, Fuzzy Logic vs Machine Learning, Recent applications of machine learning such as robotic control, data mining, autonomous navigation, bioinformatics, speech recognition and text and web data processing.

### *IS 3118 - e-Learning and Instructional Design*

Those who are interested in designing e-learning environments, should know how to design e-learning content and the environment to support learners to do their learning successfully. This course provides a broad overview of e-learning design concepts, principles and things to remember in designing effective e-learning environments. Further this course guides its' participants towards preparing a syllabus for an online course and design, develop, implement and evaluate an online/CD-ROM based course.

### *EN 3101 - Industrial Placement*

The Industry Placement provides the much needed industry exposure for the students which is an essential part of the education in order to meet Industrial standards. The Industrial Training programme is scheduled for a period of 5-6 months which improves their professionalism to make them ready for the industry. The students are placed in various sectors of the industry where they will be working as interns. Students are allowed to choose a list of interesting fields at the beginning of the programme, allowing them to work in a preferred area. The Internship programme produces quality graduates in the fields of Computer Science (CS) and Information Systems (IS).

## Year 4 Courses

### *IS 4101 - Final Year Project in Information Systems*

This research project course is designed to support the students who are following the honours degree programme in Information Systems to develop their research skills and knowledge. During the course the students will design and conduct an original research project in information systems and report and present their research findings. This is a 10 credits course and it spans both semesters of the year. The projects could be conducted individually or in groups. The size of a group should not be more than three. Each individual/ group should submit a project proposal at the beginning of the academic year. The project activities should be carried out according to the schedule provided in the undergraduate virtual learning environment and the progress of the project should be reported to the course coordinator fortnightly.

### *IS 4102 - Advanced Software Quality Assurance*

Advanced Software Quality Assurance is offered for the fourth-year students at the University of Colombo School of computing. The course is designed to deliver content related to the fundamentals of software test automation frameworks. Students will be able to enhance their software quality assurance knowledge through a practical approach by following course deliverables regarding test patterns, testing in agile frameworks, mobile application testing and security testing. Furthermore, students will gain a thorough understanding regarding testing tools that are widely used in the industry.

### *IS 4103 - Data Analytics*

This course constitutes two parts. Part I covers an introduction to Data Mining. It describes the knowledge discovery process and data mining techniques. Part II consists of pattern recognition, which spans from feature selection to performance evaluations of the classifiers. Also, it gives the introduction to Big Data Analytics. Both parts cover the theory and applications with the practical approach.

### *IS 4104 - Research Seminar*

This course is designed as a seminar series to provide a forum where students can explore literature in computing domain and demonstrate both verbal/ written skills to critically appraise research papers. The course will span over one semester and students should present / critically review, peer reviewed conference paper or a journal publication, recommended by a supervisor based on the final year research project. The forum will provide the opportunity to the audience to ask questions from the presenter and in turn the presenter to argue/ defend audience feedback. Two peer reviewers will be assigned to a presenter to give constructive feedback. At the end of this course unit students should author a research paper based on his/her final year research project.

### *IS 4105 - Advanced Concepts in Software Design and Development*

Advanced Concepts in Software Design and Development is offered in the first semester for the 4th year IS students and 4th year students at Faculty of Science, University of Colombo. This course is developed to introduce advanced concepts in software design and development together with the best practices in software development. Students are expected to analyze these concepts/practices based on their experience collaboratively. The course is a blended learning course where there will be at least two-hour interaction in the classroom done by industry experts and course coordinators and online learning activities through the virtual learning environment of the undergraduate programme. Hence, the active participation of students is expected, and it will be considered in the evaluation criteria.

### *IS 4106 - Advanced Database Management*

The expectation of this course is to acquire necessary database administration skills to assist in database support activities and to get the motivation to acquire higher database skills. This course covers advanced database concepts like database security, file organization and indexing, query processing and optimization, transaction management, concurrency control and recovery

techniques, distributed database design concepts.

### *IS 4107 - Ethical Issues and Legal Aspects in IT*

During this course students will gain an ability to describe what the term information technology ethics means, identify various advantages and disadvantages related to the code of ethics in IT, explain the term called intellectual property and explain the protections provided by copyright, patent, and trademark and the challenges which brings from IT ethics.

### *IS 4108 - Natural Language Processing*

Natural Language Processing, also referred to as Computational Linguistics is the fascinating field of building computational models of Human Language and brings together the fields as diverse as Linguistics, Mathematics, Psychology, Statistics and Computer Science. This course includes relevant materials in Linguistics and Computer Science and it is designed to cover the background knowledge required to develop NLP related applications.

### *IS 4109 - Cognitive Robotics*

This course discusses two different approaches for developing robots: conventional artificial intelligence (AI) based approaches and new AI based approaches. The topics include an introduction to basic concepts (a short history, the concept of autonomy, dynamics and kinematics, sensors and actuators, etc.), the three robotic paradigms for organizing intelligence in robots (hierarchical, reactive/behavior-based, and hybrid deliberative/reactive), robot navigation (topological path planning, metric path planning, localization and map making, etc.), as well as the topics in new AI inspired by cognitive science such as visual routines, dual coding theory, affordances, and enactive cognition. During this course, students will not only learn about how to build a cognitive robot, but also use the robotic system as a platform to test various theories and methods from cognitive science and artificial intelligence.

### *IS 4110 - Parallel Computing*

This course is designed to introduce parallel computing for students. As pre-requisites to the course, the knowledge of C is desired although not essential. As learning outcomes, students will gain the skills to develop high performance parallel programs. Syllabus of the course contains Serial and Parallel Programs, Basic Serial Performance Optimization Guidelines, Hardware for Parallel Computing, Parallel Program Design, Software for Parallel Computing: MPI, Pthreads, OpenMP; Cuda Optimizing Parallel Programs.

### *IS 4111 - Computational Biology*

After successful completion of the course, students should be able to: explain the necessary principles and methods of genomics, gene expression and proteomics and demonstrate how popular bioinformatics tools are being used in the area of bioinformatics. Students should be able to search and retrieve data using biological databases, interpreting the results, performing sequence alignment using existing popular tools and techniques.

### *IS 4112 - Geographical Information Systems*

Geographic Information System (GIS) deals with the analysis and management of geospatial information. This course offers an introduction to methods of managing and processing geographic information. Emphasis will be placed on the nature of geographic information, data models and structures for geographic information, geographic data input, data manipulation and storage, spatial analytic and modeling techniques, and error analysis. After successful completion of this course, students will be able to understand the basic GIS theory and principles; demonstrate understanding and competency of spatial data collection, format, storage, editing, and analysis; illustrate competency of map design; and acquire competency in basic knowledge and skills regarding GIS software for a basic GIS Project.

### *IS 4113 - Digital Forensics*

With the profound usage of digital media and its connectivity to cyber space, cyber-crime incidents are enormously increasing in numbers. Thus, contemporary world demands practitioners who are skilled in protecting the assets in cyber space and investigating cyber-crimes in incident scenarios. The field of computer forensics specifically focuses the investigation aspect of a cyber-crime and hence, SCS4113/ IS4013 Computer Forensics course module provides a broad understanding of the field by discussing topics such as systematic approaches in investigation, incident management, fundamentals of forensic investigation, legal aspects and more.

### *IS 4114 - IS Innovation*

Theoretical perspectives on managing IT innovations, current best practices of innovating with IT, the main theoretical perspectives on managing IT innovations, familiarize with current best practices of innovating with IT, and develop innovation skills in various organizational settings such as project teams, functional departments, organizations, communities, and society at large),Creative Problem Solving and Strategies for Creative Problem Solving,

impact of technological innovations on the economy and society, innovation skills needed for today's dynamic, global, and technology-enabled competitive environment, Innovation skills to various organizational settings such as project teams, functional departments, organizations, communities, and society at large. Personal thinking preferences, everyday creativity and eliminating mental blocks, creative thinking techniques, idea selection approaches, teaming techniques for creativity, conditions that promote creativity, design for interaction, disruptive technologies, and intellectual property. Organizations innovate with new information technologies to compete in the marketplace, collaborate with partners, serve customers, motivate employees, and improve operations. ICT innovation activities in Business systems (experience sharing with ICT and other industry expert).

### *IS 4115 - Enterprise Architecture*

This course offers a comprehensive knowledge on the principles and the practices of enterprise architecture by integrating strategic, business, and technology planning methods. The major areas covered by this course are Enterprise Architecture Frameworks, Zachman Framework for Enterprise Modelling, Service Oriented Architecture, Design Patterns, Web Architectures and Web Architectural Patterns, Enterprise/System Integration, Data/ Information Architecture and Data Integration, Agility in Business - Agile and Scrum, Enterprise Data Modelling, Green Computing, Virtualization of storage and systems, the role of open source software, and Software as a Service.

### *IS 4116 - Business Intelligence Systems*

This course is designed to give the students the ability to apply Business Intelligence technologies in an organizational setting while discussing about real life analysis, data mining methods, the social and ethical issues related to the use of Business Intelligence technologies in organizations and the method of optimizing the use of information in organizations in forecasting.

### *IS 4117 - Intelligent Systems*

Philosophy of AI, Search (Heuristic/Adversarial/Informed/Uninformed Search), Knowledge Representation and Reasoning, CommonKADs, Planning, Learning, Introduction to NLP and Linguistics, Intelligent Agents, Semantic Web, Emerging Trends.

### *IS 4118 - Embedded Systems*

This course gives a technological and scientific perspective of embedded systems. The topics include an introduction (e.g., typical components of an embedded system and application areas), embedded programming languages (e.g., programming FPGA using Verilog/VHDL, programming PIC microcontrollers using Assembly and C, and Arduino programming), embedded communication technologies (e.g., serial interfaces like I2C, SPI, UART, and 1-Wire, parallel bus interfaces, and wireless interfaces like RF, Bluetooth, Wi-Fi, ZigBee, and GPRS), technologies and protocols for creating Wireless Ad-hoc Sensor Networks (e.g., ad-hoc routing, data and power management, security, and hardware platforms such as XBee and ESP8266), and engineering approaches (e.g., flow charts, DFDs, state machines, timed-automata and UPPAAL for verification, quality and certification, and human factors). Students are required to do laboratory practicals as part of the course.

### *IS 4119 - Philosophy of Science*

This course is designed to provide a basic introduction to the main philosophical questions concerning scientific knowledge. It is specifically designed to generate an interest on epistemological concerns in research among the students who follow undergraduate courses on non-humanities subject streams. The key focus of this unit is on ideas, concepts, and thoughts that shape the nature, agenda and goal of scientific inquiry. Therefore, it provides a brief historical account on the main debates that emerged in philosophy of science since the seventeenth century. This aims to broaden the thinking of students in order to prepare them for serious academic research. The course will span over 15 lecture hours and the students' performance will be evaluated during the lectures as well as at the end of the semester. The students will be provided with reading material and useful online material to help them to follow the course successfully. Following are the key themes covered in this course.

## COMMON AWARDS

These are several awards at the Annual Convocation for the graduates with respect to the degree programme.

| | Candidates | Name of the Award |
|---|---|---|
| Most Outstanding Graduate of the UCSC | 3rd & 4th Year | *Prof. V. K. Samaranayake Memorial Medal* |
| Best Performing Students | 1st, 2nd, 3rd & 4th | *Faculty Award for Best Performing Students* |
| Director's List | 1st, 2nd, 3rd & 4th | *Faculty Award for Students with Best Academic Performance* |
| Student of the Year Award (Open Awards) | 3rd & 4th Year | *Student of the Year* |
| Peace Prize (Open Awards) | 3rd & 4th Year | *D. P. P. Samarasekera Peace Prize* |
| General Merit (Open Awards) | 4th Year | *Canekeratne Prize* |
| Academic Excellence (Open Awards) | 3rd & 4th Year | *Prof. Tilak Hettiarachchy Award* |

# RULES, REGULATIONS, & ETHICS



# ETHICS

## STUDENT DISCIPLINE

The UCSC expects its student community to be well disciplined. Resources and facilities provided are liable to be withdrawn, if they are found to be misused. Storing of unauthorized material, hacking, email spamming or software piracy is strictly prohibited in the Labs. Disciplinary action will be taken according to the UCSC regulations on such matters. Where necessary, such instances will be reported to law enforcement agencies. Students violating examination rules will be punished separately. These punishments include cancellation of exam results and suspend from academic work for specified period. Please refer the UGC Commission Circular No. 946 through the below link.

*https://cmb.ac.lk/administration/wp-content/uploads/COMMON-GUIDELINES-ON-S-TUDENT-DISCIPLINE_ugc_Commission-Circular-No.-946.pdf*

Unethical and Illegal Actions within the University Premises:

- Plagiarism, copyright infringement and cheating
- Aggressive behaviour, dissent and remonstrance
- Not being respectful (discourteous) and disobedient
- Illegal use of property, services and information
- Collecting funds without permission
- Solicitation
- Keeping and consuming alcohol, narcotic and tobacco within the University premises
- Gambling
- Harassment / violence
- Mental torture and ragging
- Sexual harassments
- Theft
- Damaging or destroying the property wilfully or maliciously

## RAGGING

Ragging and other forms of violence such as insult and cruel acts are totally prohibited according to "Prohibition of Ragging and Other Forms of Violence in Educational Institutions Act. No 20 of 1998" which has been approved by the parliament. Any act which causes or is likely to cause physical or psychological injury, fear or mental pain or fear to a student or a member of the staff of an educational institution is called ragging. The law makes ragging, a distinct and punishable offence (See Appendix A for more information).

## DISCIPLINARY ACTIONS

If any student breaks the rules in the disciplinary actions or ragging, those will be punished according to the By-Laws of University of Colombo related to the student disciplinary matters (https://cmb.ac.lk/administration/wp-content/uploads/BYLAW-ON-STUDENT-DISCIPLINE.pdf). All punishments and any disciplinary action taken shall be recorded in the students' personal file and may be reflected in the testimonial and the student record book. Punishments for ragging within or outside of the university might result in rigorous punishment based on their offense. Last academic year several students were warned for violating university regulations and they were warned in front of their parents.

# RULES AND REGULATIONS

Some of the most essential rules and regulations relevant to undergraduates are given below. These rules and regulation are in accordance with the University of Colombo School of Computing by-laws effective by 15th January 2015.

## REGISTRATION FOR THE OPTIONAL COURSES

If optional courses are offered in a particular year, students should register for such courses. Registration will commence one week prior to the start of the academic year. Optional courses having less than a specified number of students may not be offered, and students who have registered for such courses should opt for other available courses based on their preferences. No changes in courses will be permitted after 2 weeks of the commencement of the semester. Admission cards to sit for semester examinations will be issued using the registration list. Repeat student has to pay the examination fee at the time of reregistration. Most of the registration activities are now done through online application forms.

## EXAMINATION PROCEDURE

Rules to be followed in Examination

1. Students have to be **present** at the Examination Hall at least 15 minutes before starting the paper, but can't enter the hall until Supervisor gives permission.

2. Students will not be **admitted** to the Examination Hall after the **first half-an-hour of the examination**. Any student who violates this rule will be considered as an unauthorized candidate of the exam. Once admitted to the examination hall students are not allowed to leave the examination hall till the examination is over.

3. After entering the hall, students should go to the **seat** assigned to them and cannot change it without Supervisor permission.

4. Students must have their **Student Identity Card** (SIdC) and **Admission Card** for each paper. If students fail to bring their SIdC, they have to sign a declaration and produce the SIdC to the Senior Assistant Registrar/Examinations and Registration next day. If a student loses their SIdC, they can obtain a new Identity Card from the Marshal office of University of Colombo

5. **Admission Cards** are signed in front of the Supervisor/Invigilator when a student sits for a paper.

6. Students have to bring their own pens, ink or any other approved equipment and **stationery**.

7. **Examination stationery** (i.e. Writing paper, graph paper, etc.) will be supplied and only these papers can be used at the Examination. Answer books supplied to the students can not be torn or mutilated. All materials supplied, whether used or unused, have to be left behind and cannot be removed from the examination halls.

8. Students are prohibited to have any notes, formulae or any other **unauthorized material** with them during the examination. Books, handbags etc. which students have brought with him/her should be kept at a place shown by the Supervisor/Invigilator.

9. Every student has to enter their **Index Number** on the answer book and on every extra sheet. A student who writes another students index number on their answer sheet, can be considered as having attempted to cheat. The Supervisor/Invigilator has the authority to check the answer scripts of the student. An answer script that bears no Index Number or an Index Number which cannot be identified, might be rejected. Students can't write their names on the answer book.

10. Students are under the **authority** of the Supervisor and have to carry out their and invigilators instructions throughout the exam.

11. Absolute **silence** has to be maintained in the Examination hall and around it. A student cannot talk or to have any dealings with anyone other than the Supervisor/Invigilator. If a student needs to draw the attention of Supervisor/Invigilator they can raise their hand. A student can be excluded from the examination hall for causing disturbance.

12. After starting the exam, students cannot **leave** Examination hall even temporarily. In case of an emergency, the Supervisor/ Invigilator will grant them permission under constant surveillance.

13. Students have to **stop writing** immediately when Supervisor/Invigilator orders. If this instruction is not followed the Supervisor/Invigilator has the authority to make a statement on the answer book.

14. All calculations and **rough work** will be done only on given paper. Such work should not be done on admission cards, timetables, question papers or on any other paper. Any student who disregards these instructions can be considered as having written notes with the intention of copying.

15. Any answer or part of the answer which is not to be considered for the purpose of assessment, will have to be neatly crossed out. If the same question has been attempted in more than one place the answers that are to be disregarded has to be neatly crossed out.

16. Every student has to hand over the **answer scripts** personally to the Supervisor/Invigilator or remain in their seat until it is collected. They cannot hand over their answer scripts to an attendant, a minor employee or another student.

17. After **handing** over the paper, students cannot have it back.

18. Students cannot **remove** answer scripts from the Examination hall.

19. Students cannot **copy** from any material or from the answer scripts of another student. Nor can they help another student or get help from another student.

20. Impersonating students at the examination is not allowed.

21. The Supervisor/Invigilator can request a student to make a statement in writing due to an incident during the examination, and such statement will have to be signed by the student. Students cannot refuse to make such a statement or to sign it.

22. Every student who registers for an examination will be considered to have sat the examination unless:

    (a) They are permitted by the Senate for valid reason to withdraw from examination on a ground acceptable to the Senate within the given period

    OR

    (b) They submits medical certificate prior to the start of the examination or within 7 working days after the exam.

23. If a student can't present themselves for any section of an exam, they will have to notify it to the Director/UCSC immediately. This should be confirmed in writing with support document within 48 hours by registered post.

24. A student who withdraws or absent himself/herself from the examination will not be eligible for Honours at the next examination unless the senate decides otherwise.

25. Students can not sit examination, if they have exhausted the number for that examination, unless they are granted special permission to do so by the senate.

## EXAMINATION OFFENCES

Students are strongly advised against committing plagiarism in the submission of assignments and thesis reports. In the case of other written examinations, the possession of unauthorized material is considered as an offence punishable under the University of Colombo rules on conduct of examinations.

Some Examples of past punishments:

- Plagiarized content in an assignment worth less than 20% of course work – zero marks for the assignment
- Plagiarized content in an assignment worth more than 20% of course work – zero marks for entire assignment component
- Keeping unauthorised material during an examination – paper cancelled if content not relevant to the subject matter of the examination
- Keeping unauthorised material during an examination – all papers of that semester examination cancelled if content relevant to the subject matter of the examination
- Keeping unauthorised material using university property (including writing on admission card) – all papers of that semester examination cancelled and cannot sit for any examinations for one further year

## EXAMINATION OFFENCES AND PUNISHMENTS

1. Examination offences can be classified as follows:
    (a) Possession of unauthorized documents or removal of examination stationery.
    (b) Disorderly conduct.
    (c) Obtaining or attempting to obtain improper assistance or cheating or attempting to cheat.

(d) Impersonation.

(e) Aiding and abetting the commission of any of these offences.

(f) Violation of any of the requirements or conditions stipulated in Part I.

2. There shall be an Examination Disciplinary Committee to inquire into and make recommendations (including punishments) regarding examination offences.
3. In all cases of examination offences, the Supervisor will take action and forward his report to the Director/UCSC.

4. Having a prior knowledge of question paper is an examination offence.

5. If students possess unauthorized material at an examination hall, it will be presumed that they have used it until the contrary is proved by them.

6. In cases of disorderly conduct the Supervisor will in the first instance warn the student, and if the student persists in disorderly conduct, the Supervisor may exclude the student from the examination hall and issue him/her a letter cancelling their candidature from the examination.

7. In all other cases of examination offences, the Supervisor will take over the unauthorized documents and will obtain a statement from the student and write his report on the matter.

8. A student who is guilty of an examination offence is liable to following punishments.

(a) Removal of their name from the pass list.

(b) Cancellation of their candidature from whole or part of the examination.

(c) Suspension from any University examination.

(d) Suspension from the University for a period.

9. Any student found helping to commit an examination offence will receive the same punishment as the offender.

## END SEMESTER EXAMINATIONS AND CONTINUOUS EVALUATIONS

End semester examinations for a particular module, are conducted in the form of a written paper and continuous evaluations (assignments). Continuous evaluations can consist of a combination of reports, presentations, oral examinations and practical examinations. It should also be noted that there can be certain modules which do not have an end semester written examination (i.e. IS 2102 Group Project I, EN 2101 Industrial Practices, EN 3001 Industrial Placement/Industrial Project)

All examinations are conducted and completed within the given semester except for courses such as IS 2102 Group Project I, IS 3113 Group Project II. The duration of the theory examinations, practical and oral examinations are determined by the board of study for internal undergraduate degree. The duration of each examination and the rubric of the examination (i.e. final marks calculations with respect to assignments and final course exam/ evaluation) are informed during the respective semester.

## RE-SCRUTINIZATION

Provision is given for students to request for verification of their examination marks and grades if they wish to do so. However, the verification process will be limited only to check for accuracy of addition and computation and not for re-marking of scripts.
Requesting re-scrutinization of marks and grades shall be limited only during the first week immediately following the release of result of an examination. The cost of re-scrutinization process must be borne by the student and hence a non refundable fee of Rs.500/= have to be paid in advance per examination. If the marks and grades are not changed, the candidate shall be notified by the Director through Senior Assistant Registrar / Examinations of the School. However, if the marks and grades are changed, the outcome of the verification shall be notified to the candidate (s) only after the ratification of results.
The results issued to the student (s) following the re-scrutiny of marks and grades shall be the final and no more requests shall be entertained thereafter.

## ELIGIBILITY REQUIREMENTS TO SIT FOR END SEMESTER EXAMINATIONS

The main requirement in order to be eligible to sit for the end semester exam is to be enrolled in the course at the beginning of the semester. Since all the courses offered in first and second years are compulsory, students need not specifically enrol for those courses. But since optional courses are offered in third and fourth years, students are advised to specifically register for each optional course that is offered in that particular year at the beginning of that academic year. In addition a student would not be permitted to take an end of semester examination unless he/she has satisfied all the requirements of the relevant course including but not limited to:

- regular attendance at lectures ("Students are strictly advised to maintain 80% attendance at the lectures")
- attendance to laboratory classes
- submission of assignments at the appropriate time

## ABSENCE

Students who are unable to appear for a theory and/or practical component of an examination due to medical reasons should submit a Medical Certificate issued by the Chief Medical Officer (CMO)/University Medical Officer (UMO) of the University of Colombo or a valid Medical Certificate with the "Form to submit Medical Certificates" (Which will be available at the Examination Division of the UCSC or download from UGVLE) to the Medical Center of the University of Colombo.
Students are advised to strictly adhere to the following guidelines in this regard:

(1)

(a) A student who falls ill during a period of examination of the UCSC should report to the Chief Medical Officer (CMO)/University Medical Officer (UMO) of the University of Colombo. The CMO/ UMO will examine the student and issue a medical certificate, if necessary.

(b) The medical certificate issued by the CMO/UMO with the "Form to submit Medical Certificates" (which will be available at the Examinations Division of the UCSC or download from UGVLE) should be forwarded to the Medical Centre of the University of Colombo within seven working days from the examination date.

(2)

(a) If a student who resides outside Colombo city limits finds it difficult to report to the CMO/ UMO due to seriousness of the illness, he/ she should get treatment from the nearest government medical institution or SLMC Registered Doctor with M.B.B.S. Qualifications.

(b) In such instances, he/she should follow the procedure given below with regard to the submission of medical certificates:

(i) All medical certificates other than those issued by the CMO/UMO should be forwarded to the CMO/UMO along with the "Form to submit Medical Certificates" (which will be available at the Examinations Division of the UCSC or download from the UGVLE) within seven working days from the examination date.

(3)

(a) Medical certificates submitted after the above deadline and/ or without the recommendation/ observation of the CMO/ UMO will not be accepted.

(b) The following categories of medical certificates will only be accepted by the CMO/ UMO for consideration.

(i) Medical certificates issued by a government hospital/ district medical officer

(ii) Medical certificate issued by a SLMC Registered Doctor with M.B.B.S. Qualifications

(c) The CMO/ UMO may request the following documents as further proof of illness

(i) Receipt of payment for the medical certificate from the government hospital;

(ii) Prescriptions of the medicines taken;

(iii) Reports of the blood tests etc.

If the required documents are not submitted the application may be rejected.

### *Absence for Assignments and Continuous Evaluations*

In continuous evaluations (assignments), if a student is absent, the final grade is computed without the marks of the relevant assignment unless the student provides valid evidence accepted by the UCSC within a prescribed period of time. Students are advised to inform the lecturer if he/she is unable to attend to a continuous evaluation, beforehand if possible.

### *Travelling Overseas*

If a student is planning on going overseas, he/she is required to formally inform board of study for internal undergraduate degrees.

## GRADE AND GPV REQUIREMENTS FOR PASSING A COURSE

A student obtaining a grade below C (GPV below 2.00) may re-sit the course examination (if available) for the purpose of improving the grade. In the event of a student obtaining a lower grade while repeating, he/she is entitled to the previous grade. However, in calculating the award of a class in the final degree, maximum contribution from a repeated course is considered to be a C grade. Repeat candidates must apply for courses they wish to repeat when Examination & Registration Division publishes the notices in the UGVLE.

## CRITERIA FOR COMPLETION OF A COURSE

A student is considered to have completed a course (Except an Enhancement course):

- Compulsory Courses - If he/she has received a grade of "D" or above
- Optional Courses - If and only if he/she has received a Grade other than F in respect of the evaluation of such component

A student shall be deemed to have 'completed' an Enhancement Course if and only if his/her attendance at such Enhancement Course and the prescribed Course Activities if any are not less than the prescribed minimum.

## DEGREE AWARDING CRITERIA (THREE YEAR DEGREE)

A student shall not be entitled to the award of the three year Degree unless he/she has:

- Completed a minimum of 90 credits;
- Completed all Academic Credits in the first two academic years and at least 18 academic credits in the third academic year.
- Completed the number of Enhancement Credit Value Equivalents prescribed in respect of each year;
- Obtained a minimum GPA of 2.00;
- Completed the third year Industrial Placement/Industrial Project; and
- Completed the relevant requirements within six Academic Years.

## DEGREE AWARDING CRITERIA (FOUR YEAR DEGREE)

A student shall not be entitled to the award of the Honours Degree unless he/she has:

- Completed a minimum of 120 credits;
- Completed all Academic Credits in the first two years, a minimum of 18 Academic Credits in the third academic year and a minimum of 30 Academic Credits in the fourth academic year
- Completed the number of enhancement credit value equivalents prescribed in respect of each year;
- Obtained a minimum GPA of 2.50;
- Completed the third year Industrial Placement/Industrial Project; obtained a grade not inferior to a C for the fourth year Final Year Project; and
- Completed the relevant requirements within six Academic Years.

## EFFECTIVE DATE OF THE DEGREE

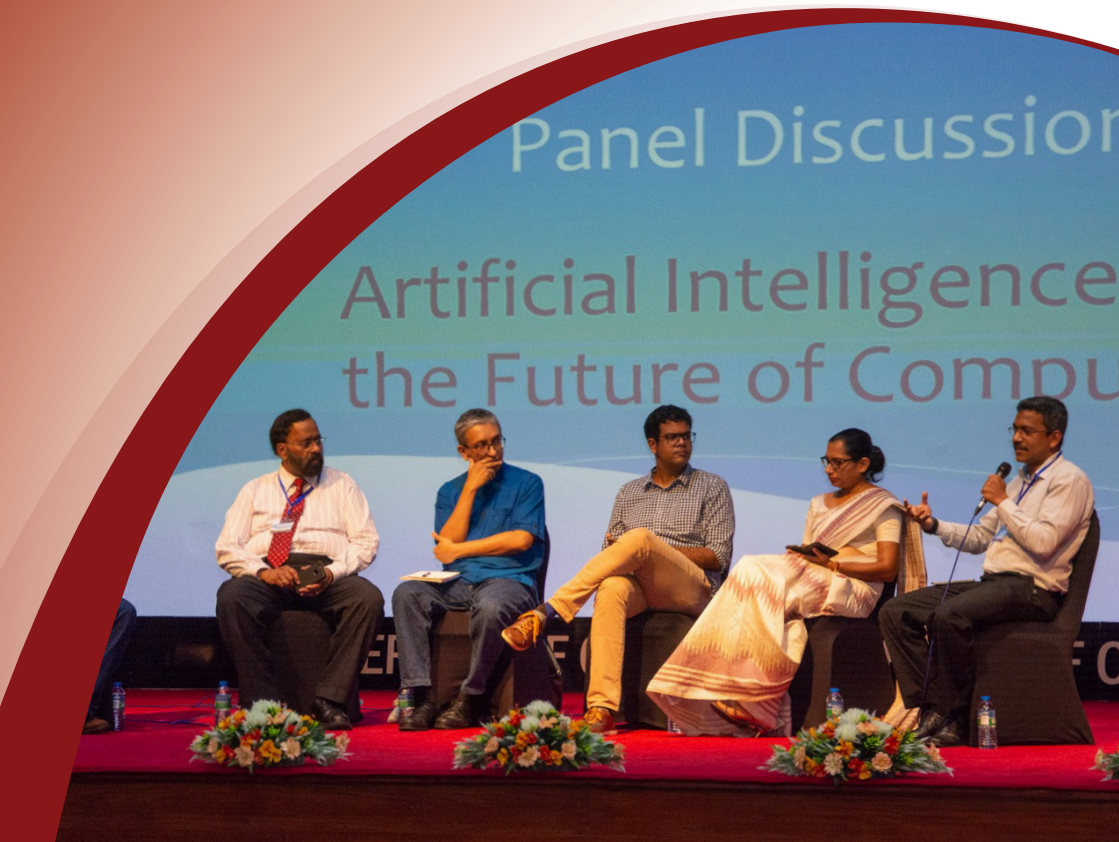
The effective date of awarding the degree shall be from the first day of the month following the last date of the final year second semester examination.

## BATCH TRANSFER POLICY

A batch transfer is to move a student from the batch that he/she has registered to a junior batch on a request of that student. Although batch transfers are

not encouraged it is possible for students to request batch transfers under genuine and exceptional circumstances with documentary evidence to prove their case. Students are advised to submit such requests at the beginning of the academic year through the head undergraduate degrees to the Board of Study/Academic Syndicate for its recommendation. A batch transfer is considered by the Board only if the student who makes the request has the provision to complete the degree programme within six years from the date of the registration. The student is placed on the same By Laws and regulations enforced at the time of his/her registration in spite of a By Law and regulation change in the later years. If there is difference in By Laws and regulations the student shall sit for repeat papers based upon the curriculum prevailed at the time of his/her registration and there is no guarantee for such student to get eligible for the special honors degree programme from his/her current batch.

# OTHER ACTIVITIES AT UCSC



# POSTGRADUATE STUDIES

## MASTERS DEGREES

UCSC conducts Masters Degrees in Computer Science (MCS), Master of Science in Computer Science (MSc in CS), Information Technology (MIT), Information Security (MIS), Cyber security (MC) and Business Analytics (MB Analytics). MCS is a specialized degree for Computer Science and IT degree holders whereas MIT is a postgraduate degree for graduates in non-computing disciplines. MIS offers mid-career opportunities for those who are working in the areas of Information Technology, Information System Audit and Information Security. MB Analytics programme is designed for graduates who wish to acquire a postgraduate qualification specializing in Data Science with the focus of Business Analytics. MC is a distance international Master Programme in Cybersecurity which covers the knowledge of Network Security and Cybercrime Investigation with the support of EU funding.

**For more details visit the web site**: *https://ucsc.cmb.ac.lk/pg*

## RESEARCH DEGREES – MPHIL/ PHD PROGRAMME

UCSC offers Master of Philosophy (MPhil) and the Doctor of Philosophy (PhD) in the field of computing.

1. Master of Philosophy (MPhil) in Computing(Full time/Part Time)
2. Doctor of Philosophy (PhD) in Computing(Full time/Part Time)

**For more details visit the web site**: *https://ucsc.cmb.ac.lk/pg*

# EXTERNAL STUDIES

## BACHELOR OF INFORMATION TECHNOLOGY (BIT)

Bachelor of Information Technology (BIT), which is to widen the higher educational opportunities for the students who have been unsuccessful in meeting the competitive eligibility criteria for admission to the state university system. Another reason has been the massive demand from the ICT industry for high quality human resources far exceeding the number provided by the state universities. The BIT degree programme commenced in the year 2000 and has so far produced 2450 graduates and almost all graduates have been absorbed by the ICT industry. Internal students of all state universities have

right to follow BIT degree programme since it is a part time programme.

**For more details visit the web site**: *http://www.bit.lk*

## FOUNDATION OF INFORMATION TECHNOLOGY (FIT)

Foundation in Information Technology (FIT), aims at enhancing the literacy and competency in using basic computer applications together with analytical thinking and communicational skills required for school leavers. It is a pre-degree programme that prepares students who are willing to read for their first degree. Furthermore, it is designed for anyone irrespective of the study streams they have followed in Advanced Level (secondary education). At the same time, FIT is an alternative qualification for students who do not possess Advanced Level qualifications to enroll into the Bachelor of Information Technology (BIT) programme. FIT is also a certification programme for employment seekers or school leavers to justify their knowledge and skills in ICT for their future endeavors.

**For more details visit the web site**: *http://fit.bit.lk/*

## SHORT-TERM COURSES

The following short-term courses are conducted by Computing Services Centre (CSC) and the Advanced Digital Media Technology Center (ADMTC) of the UCSC.

- Certificate Course on 3D Printing
- Graphic Design and Creativity Development
- Advanced Multimedia Web Design and Development Techniques
- Dynamic Web Application Development with PHP and MySQL
- Software Quality Assurance Using Test Automation Frameworks
- Java Application Development Using JavaSE
- Fundamentals of IT for Beginners
- Computing for Career Development
- Certificate Course in Videography and Video Production

**For more details visit the website**:
*https://ucsc.cmb.ac.lk/training-programmes/*

# RESEARCH GROUPS

**UCSC has established following research groups under wide areas of interest.**

**For more details visit the website:** *https://ucsc.cmb.ac.lk/research/*

## LANGUAGE TECHNOLOGY RESEARCH LABORATORY

- Dr. Randil Pushpananda *(Head of the research group)*

Language Technology Research Laboratory (LTRL) was established in 2004 to address the growing need of local language computing in Sri Lanka by doing Localization and Language Processing research and development. LTRL maintains strong relationships with all related parties, collaborating with the researchers, practitioners, linguists and policy makers in the island. The research group has a diverse range of activities: Research & Development, Consultancy, Training and Services. LTRL conducts research in the field of computational linguistics: phonetics/phonology, morphology, and syntax of local languages. These researches are mainly focused on mathematical and statistical modeling of local languages, namely Sinhala and Tamil. These research programmes are strengthened by the supervision and consultation of a panel of senior scholars from various linguistic traditions.

**More Details:** *http://ltrl.ucsc.lk/*

## SUSTAINABLE COMPUTING RESEARCH

- Dr. Kasun de Zoysa *(Head of the research group)*

The Sustainable Computing Research Group (SCoRe) has conducted research covering various aspects of sensor networks, embeded systems, digital forensic, information security, mobile applications, cloud, blockchain and software tools. The goal of the research group is to generate computing solutions through identifying low cost methodologies and strategies that lead to sustainability. SCoRe group studies and produces sustainable computing solutions with respect to low cost computing and communication foundations in the developing and emerging regions in the world. SCoRe group collaborates with a number of different research communities throughout the world.

**More Details:** *https://ucsc.cmb.ac.lk/score/*

## MODELLING & SIMULATION GROUP

- Prof. N. D. Kodikara *(Head of the research group)*

The modeling and simulation group of UCSC was initially formed in 2008 to work on a Ship Handling Simulator (ViduSayura) for the Sri Lankan Navy. This was a collaborative research effort involving personnel from the UCSC, Department of Physics of the University of Colombo, and the Sri Lankan Navy. Currently, the modeling and simulation group of UCSC collaboratively carries out various researches and development activities with national and international organizations.

**More Details**: *https://ucsc.cmb.ac.lk/simulation*

## SOCIAL LIFE NETWORKS

- Dr. M. D. J. S. Goonetillake *(Head of the research group)*

Social Life Networks for Development (SLN4D) was formed as an international collaborative research group involving researchers from Sri Lanka (University of Colombo School of Computing, University Of Ruhuna, University Of Kelaniya), Australia, Italy, and the USA. The research group aims at providing actionable information to empower people who are engaged in various sectors such as agriculture, fisheries, and healthcare using mobile technology. The group currently focuses on the applications in the areas of agriculture to harness the rich information available in social networks, public data sources including Spatio-temporal sensor data as well as the emerging cloud infrastructure.

**More Details**: *https://ucsc.cmb.ac.lk/social-life/*

## DISTRIBUTED COMPUTING GROUP

- Prof. D. N. Ranasinghe *(Head of the research group)*

Distributed Computing Research Group is concerned with the development and application of novel distributed algorithms and parallel algorithms based on shared persistent spaces. As one of the earliest virtual research groups, the Distributed Computing group gathers together researchers from the UCSC and from other universities. Recent work has been done on novel consensus algorithms for distributed ledgers, distributed ledgers for land transactions and on privacy preserved distributed machine learning.

**More Details**: *https://ucsc.cmb.ac.lk/distributed/*

# STAFF OF THE UCSC



# ACADEMIC STAFF

## SENIOR PROFESSORS



**Senior Prof. N D Kodikara**
B.Sc. (Col), Dip in App. Stat. (Col), M.Sc. (Man.), Ph.D. (Man), MCSSL

Tel: (+94) 112581245 / Ext: 6312
Email: ndk@ucsc.cmb.ac.lk
Web: http://ucsc.cmb.ac.lk/profile/ndk

**Research Interests:**
Computer Graphics, Image Processing, Computer Vision

## PROFESSORS



**Prof. K P Hewagamage**
B.Sc. (Col), Ph.D. (Hiroshima), SMIEEE

Tel: (+94) 112581245 / Ext: 8950
Email: kph@ucsc.cmb.ac.lk
Web: http://ucsc.cmb.ac.lk/profile/kph

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



**Prof. G K A Dias (On Sabbatical Leave)**
B.Sc. (SL), PG Dip (Essex), M.Phil. (Cardiff), MCSSL, MACM, MIEEE

Tel: (+94) 112581245 / Ext: 6307
Email: gkad@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/gkad

**Research Interests:**
Computer Aided Software Engineering, Multimedia for Education, Modelling and Simulation, Web Based Learning, Model driven Engineering, Machine Learning

## SENIOR LECTURERS



**Dr. A R Weerasinghe**
B.Sc. (Col), M.Sc. (Cardiff), Ph.D. (Cardiff), MIEEE

Tel: (+94) 112581245 / Ext: 6313
Email: arw@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/arw

**Research Interests:**
Natural Language Processing, Text Mining, Machine Learning, Artificial Intelligence



**Dr. D N Ranasinghe**
B.Sc. (Elect. Eng.), M.Sc., DIC (Lond), Ph.D (Cardiff), MIEEE, MIET

Tel: (+94) 112581245 / Ext: 6311
Email: dnr@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/dnr

**Research Interests:**
Distributed Algorithms, High Performance Computing, Models of Computation



**Dr. T Sritharan**
B.Sc. (Hons)(Jaffna), Ph.D. (Sussex, UK)

Tel: (+94) 112581245 / Ext: 6317
Email: rts@ucsc.cmb.ac.lk

**Research Interests:**
Positive Operators in Ordered Spaces



**Mr. G P Seneviratne**
B.Sc. (Col), PG. Dip in Comp. App. (Col), MSc. (Cardiff), M.Phil. (Cardiff), MIEEE

Tel: (+94) 112581245 / Ext: 6309
Email: gps@ucsc.cmb.ac.lk
Web: http://ucsc.lk/ profile/gps

**Research Interests:**
Natural Algorithms, Machine Learning, Social Networking, IOT



**Dr. D D Karunaratna (On Sabbatical Leave)**
B.Sc. (Col), M.Sc. (Swansea), Ph.D. (Cardiff)

Tel: (+94) 112581245 / Ext: 6314
Email: ddk@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/ddk

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



**Dr. G D S P Wimalaratne**
B.Sc. (Col), Ph.D. (Salford), SMIEEE, MCSSL

Tel: (+94) 112581245 / Ext: 8949
Email: spw@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/spw

**Research Interests:**
Graphic and Simulation, Virtual Environments, Code Analysis, Assistive Technology



**Dr. D A S Atukorale**
B.Sc. (Col), Ph.D. (QUT), MIEEE, MCSSL

Tel: (+94) 112581245 / Ext: 8965
Email: aja@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/aja

**Research Interests:**
Machine Learning, Computer Networks and Virtualization, Pattern Recognition, Computer Systems, Intelligent Systems, Big Data Analytics



**Dr. (Ms.) M D J S Goonetillake**
B.Sc. (Col) M.Sc. (Keele) Ph.D. (Cardiff)

Tel: (+94) 112581245 / Ext: 8945
Email: jsg@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/jsg

**Research Interests:**
Sensor Network Data management, Database Security, Social Networks and Applications, Data Management, NOSQL Data Sores



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

Tel: (+94) 112581245 / Ext: 6310
Email: kasun@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/kasun

**Research Interests:**
Information Security, Sensor Networks, Embedded Systems



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

Tel: (+94) 112581245 / Ext: 6316
Email: cik@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/chamath

**Research Interests:**
Computer Networks, Distributed Systems, Operating Systems



**Dr. K L Jayaratne (On Leave)**
B.Sc. (Col), Ph.D. (Western Sydney, Australia), MCSSL, MIEEE, MACS

Tel: (+94) 112581245 / Ext: 6315
Email: klj@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/klj

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



**Dr. H A Caldera**
B.Sc. (Col), PG Dip in Comp Tec, M.Sc. (Col), Ph.D. (Western Sydney, Australia)

Tel: (+94) 112581245 / Ext: 6320
Email: hac@ucsc.cmb.ac.lk
Web: http://ucsc.cmb.ac.lk/profile/hac

**Research Interests:**
Data Mining, Web Mining, Data Analytics



**Dr. M G N A S Fernando**
B.Sc. (Col), M.Sc.(Col), Ph.D (Col), MCSSL, MIEEE, SEDA (UK)

Tel: (+94) 112581245 / Ext: 6318
Email: nas@ucsc.cmb.ac.lk
Web: http://ucsc.cmb.ac.lk/profile/nas

**Research Interests:**
Data Mining, Machine Learning, ICT Education, Algorithms, MIS, ICT and Society, e-government, Blended Learning



**Dr. (Ms.) S M K D Arunatileka**
B.Sc. (Col), MBA (SJP), Ph.D. (Western Sydney)

Tel: (+94) 112581245 / Ext: 6306
Email: sda@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/sda

**Research Interests:**
ICT for Development, eBusiness, eTransformation, eHealth, ICT for Economic/Social Development, IT Strategic planning, Music and IT, IT for Ethnic Harmony



**Dr. M D R N Dayaratne**
B.Sc. (Col), Ph.D. (Stockholm)

Tel: (+94) 112581245 / Ext: 6321
Email: rnd@ucsc.cmb.ac.lk

**Research Interests:**
Information Security and Audit, Information Privacy



**Mr. K P M K Silva**
B.Sc. (Col), M.Sc. (York)

Tel: (+94) 112581245 / Ext: 6319
Email: mks@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/mks

**Research Interests:**
High Performance Computing



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

Tel: (+94) 112581245 / Ext: 8976
Email: crw@ucsc.cmb.ac.lk
Web: http://ucsc.cmb.ac.lk/profile/crw

**Research Interests:**
Bioinformatics, Computational Biology



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

Tel: (+94) 112581245 / Ext: 8975
Email: www@ucsc.cmb.ac.lk
Web: http://ucsc.cmb.ac.lk/profile/www

**Research Interests:**
Computational Morphology, Computational Linguistics, Automatic Text Summarization, Natural Language Processing, Text Processing



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

Tel: (+94) 112581245 / Ext: 8984
Email: hbe@ucsc.cmb.ac.lk
Web: https://ucsc.cmb.ac.lk/profile/hbe

**Research Interests:**
Affective Computing, Cognitive Robotics, Embedded Systems, Human-Computer Interaction, Serious Games, Brain Computer Interface



**Dr. (Ms.) T A Weerasinghe**
B.Sc. (Col), M.Sc. in IT (Col), Ph.D (Stockholm)

Tel: (+94) 112581245 / Ext: 8982
Email: taw@ucsc.cmb.ac.lk
Web: http://ucsc.cmb.ac.lk/profile/taw

**Research Interests:**
e-Learning, Instructional Design, Multimedia Technologies, Information Systems, ICT4D



**Dr. M I E Wickramasinghe**
B.Sc. (Col), Ph.D. (Monash)

Tel: (+94) 112581245 / Ext: 8985
Email: mie@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/mie

**Research Interests:**
Machine Learning, Data Mining, Image Processing, Computer Graphics, Player Modelling



**Dr. (Ms.) L N C De Silva**
B.Sc. (Pdn), Ph.D. (Col)

Tel: (+94) 112581245 / Ext: 8976
Email: lnc@ucsc.cmb.ac.lk
Web: http://ucsc.lk/profile/lnc

**Research Interests:**
ICT4D, Social Life Networks, Software Engineering



**Dr. (Ms.) K H E L W Hettiarachchi**
BIT (Col), MCS (Col), Ph.D. (Barcelona)

Tel: (+94) 112581245 / Ext: 8958
Email: eno@ucsc.cmb.ac.lk
Web: https://ucsc.cmb.ac.lk/profile/eno

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



**Dr. P V K G Gunawardana**
B.Sc. (Hons)(Col), Ph.D. (Monash)

Tel: (+94) 112581245 / Ext: 8971
Email: kgg@ucsc.cmb.ac.lk

**Research Interests:**
Machine Learning, Cyber Security, Digital Forensics



**Dr. (Ms.) H N D Thilini**
B.Sc. (Col), Ph.D. (Col)

Tel: (+94) 112581245 / Ext: 8976
Email: hnd@ucsc.cmb.ac.lk

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



**Dr. B H R Pushpananda**
BSc in Eng. Phys. (Col), BIT (Col), MCS (Col), Ph.D. (Col)

Tel: (+94) 112581245 / Ext: 8969
Email: rpn@ucsc.cmb.ac.lk

**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**
B.Sc. (OUSL), PG. Dip. (Com. Tech.), PG. Dip. (IM), M.Sc.(IM), MCSSL, Ph.D. (MSU)

Tel: (+94) 112581245 / Ext: 8958/8956/8955
Email: ssp@ucsc.cmb.ac.lk

**Research Interests:**
Enterprise Resource Planning, Internet Application Development, Web Accessibility, Information Management, Software Quality Assurance, eLearning, e-Governance



**Dr. H K T C Halloluwa**
BSc. (SLIIT). MACM, CTHE-SEDA(UK), PhD (QUT), MCSSL

Email: tch@ucsc.cmb.ac.lk

**Research Interests:**
Technology Enhanced Learning, Gamification, HCI, UX, Learning Analytics, Visualization

## SENIOR LECTURERS (ON CONTRACT)



**Dr. K A K T Karunanayake**
B.Sc. (Hons) in IT (UoM), Ph.D. (NUS)

Email: ktk@ucsc.cmb.ac.lk

**Research Interests:**
Human Computer Interaction, Multi-sensor Technologies, Embedded Systems



**Dr. (Ms.) M G D K Fernando**
BSc (Col), PhD (Binghamton)

Email: dkf@ucsc.cmb.ac.lk

**Research Interests:**
Virtualization, Software defined Networking, Security

## LECTURERS (PROBATIONARY)



**Ms. K P U Jayasinghe (On Study Leave)**
B.Sc. (Col)

Email: ujp@ucsc.cmb.ac.lk

**Research Interests:**
Game Based Learning, Image Processing, Computer Graphics



**Ms. R M P N Somaratne (On Study Leave)**
B.Sc. (Hons) (SLIIT), M.Sc. in Management and IT (Kelaniya), MCS (SL), MIEEE

Email: pns@ucsc.cmb.ac.lk

**Research Interests:**
ICT4D, e- Health, e-Governance, Information Systems



**Mr. R N Rajapakse (On Study Leave)**
B.Sc. (Hons)(Col), CAPM, MIEEE, CTHE-SEDA (UK)

Email: rnr@ucsc.cmb.ac.lk

**Research Interests:**
Cognitive Science, Neuroinformatcs, Medical Image Processing, Forensic Facial Reconstruction, Enterprise Resource Planning systems



**Mr. R A H D Perera (On Study Leave)**
B.Sc. (Hons)(Col), CTHE-SEDA (UK)

Email: hdp@ucsc.cmb.ac.lk

**Research Interests:**
Software Engineering, Human Values, Software Traceability



**Mr. A P Sayakkara (On Study Leave)**
B.Sc. (Col), CTHE

Email: asa@ucsc.cmb.ac.lk

**Research Interests:**
Wireless Networks, Embedded Systems, Network Security



**Mr. R M U A Rathnayake**
B.Sc. (Col), CTHE-SEDA (UK)

Email: uar@ucsc.cmb.ac.lk

**Research Interests:**
Computational Biology, ICT4D, Text Mining, Mobile Computing, HIC



**Ms. D N Perera**
B.Sc. (Col), CIMA (UK), CTHE-SEDA (UK)

Email: dnp@ucsc.cmb.ac.lk

**Research Interests:**
ICT for Development, Natural Language Processing, eBusiness, Business Process Management, e-Learning



**Ms. R A Y S Ranasinghe**
B.Sc. (Hons)(RJT), CTHE-SEDA (UK), MIEEE

Email: ysr@ucsc.cmb.ac.lk

**Research Interests:**
Context-Aware Computing, IoT, Information Security, Visible Light Communication



**Mr. P K M Thilakarathna**
BIT (Col), MPhil (Col)

Email: kmt@ucsc.cmb.ac.lk

**Research Interests:**
Information Security, Digital Forensics, Network Security



**Dr. K D Sandaruwan (On Study Leave)**
B.Sc. (Col), Ph.D. (Col)

Tel: (+94) 112581245 / Ext: 8993
Email: dsr@ucsc.cmb.ac.lk

**Research Interests:**
Virtual Reality, Augmented Reality, Tracking and Surveillance, Modelling and Simulation



**Mr. M A I M Dharmadasa**
B.Sc. (Hons)(Col), MIEEE

Email: imd@ucsc.cmb.ac.lk

**Research Interests:**
Sensor Networks, Machine Learning, Information Privacy



**Mr. R J Amaraweera**
B.Sc. (Hons)(Col), MIEEE

Email: rja@ucsc.cmb.ac.lk

**Research Interests:**
Data Mining, Machine Learning, Learning Analytics, Big Data, Artificial Intelligence



**Ms. G K K Perera**
B.CS (Special) (Ruh)

Email: gkk@ucsc.cmb.ac.lk

**Research Interests:**
Bioinformatics, Algorithms, Machine Learning



**Ms. C L I S Fonseka**
B.Sc. in CS (Hons)(Esn)

Email: cli@ucsc.cmb.ac.lk

**Research Interests:**
Mobile Computing,Image Processing,Machine Learning, Software Quality Assurance



**Ms. A L Nanayakkara**
B.Sc. (Hons)(Col)

Email: aln@ucsc.cmb.ac.lk

**Research Interests:**
Computer Vision, Machine Learning, Natural Language Processing

## LECTURERS (ON CONTRACT)



**Mr. D I Bamunuarachchi**
BSc. (Hons.) in IT (UoM), MCS (Col)

Email: dib@ucsc.cmb.ac.lk

**Research Interests:**
Optimization, Heuristic Algorithms

## INSTRUCTORS



**Mr. G P N Boteju**
B.Com. (Col), PG Dip in Comp Tec (Col)

Email: gpn@ucsc.cmb.ac.lk

## TEMPORARY ACADEMIC STAFF

Please refer the details of the Temporary Assistants Lecturers and the Instructors through the below link.
*https://ucsc.cmb.ac.lk/ucsc-staff/academic-staff/#temp_aca*

# APPENDIX A: FORMS OF RAGGING

Forms of Ragging:

- Any person who whilst committing ragging causes sexual harassment or grievous hurt to any student or a member of staff.

- Any person who within or outside an educational institution threatens verbally or in writing to cause injury to any person, reputation or property of any student or a member of a staff of any higher education institution or to a person, reputation or property some other person in whom the victim is interested with the intention of causing fear in the victim or of compelling the victim to do any other act which the victim is legally not required to do or to omit to do any act which the victim is entitled to do.

- Any person who does any act by which the personal liberty and the freedom of movement of any student or a member of staff of an education institution; or other person within such educational institution or any premises under the management and control of such educational institution, is restrained without lawful justification and for the purpose forcing such student, member of the staff or person to take particular course of action.

- Any person who unlawfully obstructs any student or a member of the staff of an educational institution, in such a manner as to prevent such students or member of staff from proceeding in any direction in which such student or member of staff has right to proceed.

- Any person who unlawfully restrains any student or a member of staff of an education institution in such a manner as to prevent such student or a member of the staff from proceeding beyond certain circumscribing limits.

- Any person who without lawful excuse, occupies by force, any premises of or under the management or control of, an education institution.

- Any person who causes mischief in respect of any property of or under the management or control of an education institution.

The summarized punishments for ragging described under the Act include:

- After the individual is found guilty, the punishment for ragging within or outside of the university premises is two years' rigorous imprisonment.

- In addition, the court can award compensation to the victim.

- Where ragging leads to sexual harassment or grievous hurt, the punishment is increased to ten years' imprisonment and an award of compensation. The latter offence is generally non-liable.

- The punishment for anyone who acts with the intention threatens to cause injury to the person, reputation or property of any student or threatens to cause injury to a person known to the student is rigorous imprisonment for no more than five years.

- Acts of criminal intimidation, wrongful restraint and unlawful confinement committed by any person against any student carry a maximum imprisonment period of seven years.

- Anyone forcefully confining an individual would face the same punishment.

- If any person forcibly occupies any premises of an educational institution, that person is guilty of an offence. Such person could be imprisoned for no less than ten years and no more than twenty years of imprisonment. In accordance with the Act, a fine can also be imprisoned.

- In addition, the court can, depending on the gravity of the offence, the order the expulsion of a student from an educational institution if that person is found guilty of any of the offences contained in the Act.

- If anyone is charged or is under suspicion of sexual harassment or grievous injuries due to ragging as stated in Section 2(2) in the Act or, if it leads to confinement or restraint of another's freedom of movement, as noted in Section 4, this is a non-bailable offence.

- Other than the punishment codes within this act, those of 1994 No.22 on harassment, extreme and torture or insults add to this.



# APPENDIX B: APPRECIATION OF PROF. V. K. SAMARANAYAKE

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 on 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 meager funding resources extended by donors in 1970's an 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.

- Prof. Samaranayake's inspired the government which declared an Information Technology Week in December, 2004. He also continued as Chairman of the International Information Technology Conference till his untimely demise.

# APPENDIX C: MILESTONES in the pioneering efforts in Computing of the University of Colombo

| | | |
|---|---|---|
| Late 1960s | - | First mechanical calculators of Nippon and Facit models were used for teaching Statistics in the department of Mathematics |
| 1967 | - | Teaching of Fortran as a programming language began at then University of Ceylon, Colombo |
| 1968 | - | Establishment of the Statistical Unit under the department of Mathematics |
| 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 |
| 1970s | - | The University of Colombo started teaching Fortran programming on mainframe ICL 1901 and the practical sessions were carried out using IBM Model 29 alpha-numeric punch card machine at the State Engineering Corporation, and subsequently the IBM mainframe S/360 Model 25 at the Department of Census and Statistics was used for studies. |
| 1972 | - | Under the Higher Education Reforms that took place in 1972 (Osmond Jayaratne Report), 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. |
| 1974 | - | Establishment of the Statistical Consultancy and Data Processing Service |
| 1974 | - | The University of Reading, UK and the University of Colombo established a collaboration in 1974 for a period of 10 years and the University of Reading contributed to the Statistical Unit to become a National Centre for Statistical Research, Teaching and Consultancy |
| 1977 | - | Under the Colombo-Reading Collaboration, the Department was gifted a 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 |
| 1980 | - | Establishment of Computer Centre |
| 1981 | - | The first mini computer Data General Eclipse Model S/140 was purchased with time sharing OS and 16 VDU for Fortran and Cobol Programming |
| 1981 | - | The curriculum in Computing was enhanced by introducing a new course in Numerical Analysis for the undergraduates of the Faculty of Science |
| 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. |
| 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 |
| 1982 | - | Permission was granted to introduce two new course units for 3rd year students under Applied Mathematics Module. The two course units are AM 204- Scientific Computing and AM 205- System Analysis and Computer Application in Finance and Management. |
| 1983 | - | Computer Assisted Education was introduced by the Ministry of Education to three schools as a pilot project and the University of Colombo assisted the Ministry in launching its Computer Education Programme through teacher training. |
| 1984 | - | Tandy Radio Shack TRS model 80 desktop machine running XENIX for Unix/C programming was installed. |

| | | |
|---|---|---|
| 1984 | - | The university of Colombo organised the First Asian Regional College on Microprocessor Technology and Applications held in Sri Lanka 4th to 29th June in collaboration with the International Centre for Theoretical Physics, Trieste, in association with the University Grants Commission and the Computer and Information Technology council (CINTEC) of Sri Lanka. |
| 1985 | - | Standard IBM PC/XT PC based on 8086/88 running MSDOS was introduced for Labs. |
| 1985 | - | Establishment of the Department of Statistics and Computer Science (DSCS) |
| 1986 | - | Introduction of the first ever Postgraduate Diploma in Computer Applications, firstever of its kind in Sri Lanka 24 University of Colombo School of Computing |
| 1987 | - | Establishment of the Institute of Computer Technology (ICT) (Funded by JICA) |
| 1987 | - | Collaboration between the Department of Statistics and Computer Science of the University of Colombo, Sri Lanka and the Department of Computing Mathematics, University of Wales College of Cardiff, United Kingdom was established. |
| 1988 | - | NEC 430 mainframe was donated by Japan with 60 terminals for interactive Computing |
| 1989 | - | Introduction of the first ever MSc Degree in Computer Science (Funded by UNDP) |
| 1989 | - | Occupation of the Computer Science Building Complex |
| 1990 | - | First Bachelor's degree in Computer Science in Sri Lanka was launched on 14th July by the Department of Statistics and Computer Science. |
| 1992 | - | Sun Microsystems Workstation Lab with 10 machines running SunOS 4.1.2 with a 10Mbps Ethernet for Scientific Computing was installed. |
| 1992 | - | Commencement of Third Country Training Programs (TCTP) (Supported by JICA) |
| 1994 | - | A dial up email service was provided for the University of Colombo when internet was first launched in Sri Lanka. |

| | | |
|---|---|---|
| 1997 | - | Online Internet access via Lanka Education and Academic Research Network a Sri Lanka Telecom based 64kbps leased line network; British Computer society accreditation was received for the degrees in Computer Science. |
| 1997 | - | Director ICT was Presented with JICA President's Award for International Corporation |
| 1998 | - | International Conference in Information Technology (IITC) was organised by UCSC and subsequently named as ICTER with IEEE technical sponsorship |
| 1998 | - | Commencement of Graduate Training Programme |
| 1999 | - | Institute of Computer Technology Presented with JICA President's Award |
| 2000 | - | A joint PHD program was started for the internal staff of Sri Lankan universities with UCSC as focal point and with the assistance of Swedish Universities of Uppsala, KTH, Gothenburg, Mid Sweden lunched (Supported by SIDA) |
| 2000 | - | The Sinhala language Unicode was designed and published |
| 2000 | - | Introduction of the Bachelor of information Technology (BIT) External Degree Programme |
| 2001 | - | Commissioning of Campus Wide Fiber Network (Funded by SIDA) |
| 2001 | - | Establishment of the Department of Computer Science (DCS) |
| 2002 | - | Establishment of the Advanced Media Technology Centre (ADMTC) (Supported by JICA) |
| 2002 | - | Establishment of the UCSC by the merge of the ICT & DCS University of Colombo School of Computing 25 |
| 2002 | - | Commencement of Advanced MSc (Research based) and Master of Information Technology Programmes |
| 2002 | - | Implementation of Virtual Learning Environment for BIT (External Degree) |
| 2003 | | Funds were received from IDRC for local language research through PAN localisation research project |
| 2004 | - | Introduction of the Information & Communication Technology Degree Programme for Students |
| 2005 | - | The third phase of the third country training programme with JICA collaboration was launched |

| | | |
|---|---|---|
| 2005 | - | Extension of Virtual Learning Environment for all UCSC Students |
| 2006 | - | UCSC launched an International Journal of ICT for Emerging Regions (ICTER) |
| 2009 | - | Linneas-Palmer exchange program was established for the staff and students in collaboration with Umea University, Sweden |
| 2009 | - | Commencement of Master of Science in Information Security Degree Programme |
| 2011 | - | Establishment of the Center for Digital Forensics |
| 2012 | - | Commencement of Masters in Bioinformatics jointly with IBMBB |
| 2012 | - | Software Engineering Specialization introduced to the Computer Science Degree Programme |
| 2012 | - | BICT Degree Programme renamed as Information Systems |
| 2013 | - | With the active involvement of UCSC, most public services available at the Department of Register General, Department of Land Registry, Police fingerprinting and other services were computerised under the Sri Lankan government e-services drive |
| 2013 | - | Student Exchange Programme with Umea University, Sweden |
| 2013 | - | Restructuring of Masters Programmes as Master of Computer Science & Master of Information Technology |
| 2015 | - | A Separate Bachelor's Degree in Information Systems and Software engineering was introduced at the University of Colombo School of Computing |
| 2017 | - | Celebrating the Golden Jubilee of Computing at University of Colombo |
| 2017 | - | Opening of the Vidya Jyothi Prof. V K Samaranayake Auditorium |
| 2017 | - | Restructuring of Master of Information Technology, Master of Computer Science, Master of Information Security (MIS) and Introduction of Master of Science in Computer Science (MSc. in CS) |
| 2018 | - | Introduction of Master of Cybersecurity course |
| 2018 | - | Opening of the Admin Block of the new building |
| 2019 | - | Introduction of Master of Business Analytics course |




University of Colombo School of Computing,
No 35, Reid Avenue, Colombo 00700,
Sri Lanka.
Tel: +94 -11- 258 1245 / 7
Fax: +94-11-258 7239
email: info@ucsc.cmb.ac.lk
www.ucsc.cmb.ac.lk