Degree of

BACHELOR OF INFORMATION TECHNOLOGY

(*External)*

Institute of Computer Technology
University of Colombo

Contents

1 Background of the Organisations Associated with the External Degree (BIT) Programme

1.1 University of Colombo

The history of higher education in Sri Lanka is closely linked to that of the University of Colombo. Established in the year 1870, as the Ceylon Medical College by the Government of that day under the leadership of Governer, Sir Hercules Robinson, the University of Colombo could claim to have been associated with higher education for over 100 years. This is an important legacy that all undergraduates who join the University of Colombo must be aware of and be proud of.

The vision of the University of Colombo, is to become a centre of excellence of international repute that contributes siginificantly to national development and human resource development particularly, in the South Asian region. Conscious of its long traditions as a leading tertiary education institution in the island, it will promote scholarship and research. It will seek to create and sustain a culture of learning and critical inquiry that respects viewpoint differences, inculcating a sense of social responsibility and service and commitment to democratic values in plural society.

The University of Colombo is a metropolitan university and the students are at a distinct advantage being at the hub of cultural, economic and political activity in the country. Since its establishment as a distinct university, it has expanded its departments and programmes, and acquired a reputation within the country and abroad for academic excellence.The university has many faculties and institutes which are in great demand for the programmes they offer for undergraduate and postgraduate students, and for a wider community. The services of its staff are also increasingly used by the research community, international development agencies and the governmental and non-governmental sectors.

Students should feel very priviledged to belong to the university of Colombo with its long tradition of excellence in teaching, learning, research and contribution to the community. The University of Colombo started its computing acivities in 1967 and today it is the most advanced higher educational institution, in the forefront of human resoruce developmet in Information Technology in Sri Lanka.

1.2 Institute of Computer Technology (ICT)

The Institute of Computer Technology (ICT), University of Colombo established in 1987 is the most advanced training institute in Sri Lanka in the field of Information Technology (IT). The vision of the ICT is to be a centre of international repute in training in Information and Communication Technologies.

The major goal of the ICT is to prepare students for careers in Information Technology as Software Developers, Systems Analysts, Network Administrators, Web Developers, IT Managers, IT Strategic Planners and IT Policy Makers. During the last decade, the ICT not only enhanced its computing and manpower resources, but also enriched the consultancy services provided and its training programmes keeping with the rapidly changing technology.

ICT currently conducts ***one-year full-time and two-year part time Postgraduate Diploma Courses in Information Technology***, which are conversion courses specifically designed for graduates with non-computer science degrees. The ICT graduates have been readily absorbed into various economic sectors of the country and some have secured better overseas employment opportunities with relative ease.

The Institute also conducts Certificate level Courses in the ***Use of IT for Development, Structured Systems Analysis and Design and Software Design Development*** for those who are in employment and need to sharpen their skills in IT. The ICT also conducts many short courses in areas such as Advanced Programming in C, Database Management and Design, Database Administration, Computer Networking, Windows Programming, Computer Aided Drafting, Maintenance and Upgrading PC hardware, Internet programming, Programming in Visual Basic and JAVA etc.

The institute is now sharing its resources, knowledge and experience with other developing countries in the region through the JICA, Commonwealth Secretariat and Colombo Plan Secretariat - sponsored Third Country Training programmes.

1.3 Department of Statistics and Computer Science (DSCS)

The DSCS of the University of Colombo conducts courses in Computer Science and Computer Applications for undergraduates of the university. A ***special degree course in Computer Science and a M.Sc.Course*** in the same subject were launched in March 1990 with financial assistance from the UNDP. The Department of the Computing Mathematics of the University of Wales, College of Cardiff, is assisting in this project.

Programmes are now launched to make the activities more research-oriented and facilities are being used to conduct research degrees for M. Phil and Ph.D candidates in the areas of computer science. Also, an M.Sc. in statistics and a special degree in Statistics were launched in 1996. The DSCS also conducts two, 4-year Special degree programmes in Computer Science and Statistics.

The Computer Science special degree and the MSc. in Computer Science offered by the DSCS are now accredited by the British Computer Society.

DSCS is equipped with a range of powerful computer systems and its staff consists of personnel with high qualifications in Computer Science. They are engaged in research, consultancy and in providing training in a variety of computer related disciplines.

Beginning in 2001, further progress has been made by splitting the DSCS into two separate departments – Department of Computer Science (DCS) and Department of Statistics (DS).

1.4 Computing Services Centre (CSC) of ICT

The Computing Services Centre (CSC), which is the Consultancy arm of the ICT was established in 1990 to provide Consultancy Services to the IT industry and related industries using the human and material resources of the ICT and the DSCS of the University of Colombo. The combined staff of DSCS, ICT and CSC consist of 10 Ph.Ds, 5 M.Phils, 14 M.Scs, 1 MBA,16 B.Scs & 1 B.Dev. CSC has been involved in a large number of Human Resource Development projects in IT, Consultancy projects, Systems Recommendations, Systems Design and Developments to many organisations in the public and the private

sector. Being institutions of the University of Colombo occupying the same building, the ICT, DSCS and the CSC share their resources, equipment and manpower in these consultancy assignments.

Graduate Training Programme in IT (GTP-IT) conducted by ICT/DSCS/CSC was launched in 1998 with the objective of providing short-term job-oriented training to University Graduates of other disciplines to satisfy the human resource requirement of the Sri Lankan Software industry. Around 200 graduates have been now trained under this programme and all participants, on completion of the programme were employed by various government and private sector organisations.

1.5 Academic Programmes Successfully Conducted by ICT/DSCS/CSC for Overseas Participants

Structured Systems Analysis and Design Methodology (SSADM) for participants from south, south east, pacific countries. (1993-1998) on an agreement with Japan International Cooperation Agency (JICA)

Audit and Control in a Computerised Accounting Environment for Managers for participants from the Commonwealth countries from the same region. sponsored by the Management and Training Services Division (MTSD) of the Commonwealth Secretariat. Later in May, 1996, this programme was repeated in Male for the participants from the Republic of Maldives with the sponsorship of the same agency. The Coopers and Lybrand (Colombo) associated with ICT in conducting these programmes.

In 1996, CSC conducted a training programme for participants from the same region on **"Planning, Designing and Analysing Data from Health Surveys"** in collaboration with the DSCS. This programme was sponsored jointly by the Commonwealth Secretariat and the WHO.

In 1998, the ICT commenced a **Special One Year Diploma in Information Technology** for over 35 participants from the Republic of Maldives and Bhutan in response to a request made by the respective governments.

Since 1998, ICT has been conducting the **"Third Country Training Programme in Information Systems Engineering"** for 20 participants annually in the South, South Asian and Pacific regions. In 2000,

participants from the African continent too are included in JICA funding for TCTP. From 2000 onwards the Colombo Plan has pledged to fund participants for the TCTP from Mongolia, Iran and the Philippines.

2 Job Opportunities in Information Technology (IT)

The 21st Century would be dominated by IT and there is a growing need for IT professionals. This, together with the critical shortage of IT professionals today, translate into opportunities for those in IT as well as those interested in entering the field.

2.1 An International Perspective

- A study by the Information Technology Association of America in 1999 reveals that 346,000 jobs are currently vacant in U.S. companies leaving 1 in 10 jobs unfilled

- According to U.S. Commerce Department's Office of Technology, America's shortage of IT workers between 1996-2006 would be more than 1.23 million systems analysts, computer scientists, engineers and programmers

- Microsoft estimates that in the 12 month period from August 1999 to August 2000, its business partners & customers would require approximately 647,000 new IT professionals

These figures reflect the glaring IT work force shortage in U.S. alone. The situation is no different in other developed countries such as Germany, UK and Canada. Finding qualified IT professionals is a global challenge.

2.2 A Sri Lankan Perspective

- At the moment, the demand for IT graduates in Sri Lanka is high, well over 1000 per year

- The supply of IT graduates at present is totally inadequate to meet this demand. The number of Computer Science/Engineering Graduates with a four-year honours degree is around 200 per year,

which includes both the state and the private sector universities. Taking into account graduate training programmes and non-university qualifications equivalent to a degree, would still add up to not more than 500.

2.3 Benefits to the Country Derived by Increasing the Number of IT Graduates

Software Development & IT Services is one sector where Sri Lanka can do remarkably well and have highly satisfactory economic returns which in turn will benefit the national economy.

In this context, we need to heighten public awareness on the unlimited potential of IT and increase educational opportunities in the sphere.

3 The External Degree (BIT) Programme

Taking into consideration the large number of job opportunities that exist for IT graduates in Sri Lanka & overseas, the ICT has taken the initiative to launch the External Degree (BIT) programme leading to the award of Degree of Bachelor of Information Technology (External) – BIT.

The ICT, DSCS and CSC together having the most advanced training resources and experience in Sri Lanka in the field of IT training will conduct the Degree of Bachelor of Information Technology (External) programme. The ICT will conduct examinations leading to the first-ever External Degree in IT in Sri Lanka, with effect from Year 2000.**The degree will be awarded by the University of Colombo**.

ICT will provide a well-defined detailed syllabus that would help to lay a solid foundation on which, a student can build his/her career in IT. The syllabi will be constantly updated to meet the industry requirements. Model question papers, a list of recommended textbooks will be provided to the students. The expertise of more than 20 Ph.Ds, 5 M.Phils, 20 M.Scs and 3 M.B.As drawn from the University of Colombo, other Sri Lankan Universities and the IT industry will be associated with the programme, which will make the BIT a first in Sri Lanka to benefit from such expertise.

Programme is designed to:

- produce qualified IT professionals in addition to the traditional University output
- set professional standards and encourage students to obtain skills in commercial IT applications and in the usage of necessary tools
- enable those who could not enter the university due to severe competition to work towards obtaining a degree
- give an opportunity to those non-graduates already working in IT to obtain a formal qualification in IT through self study.

The duration of the external degree (BIT) programme will be 3 academic years.

- **A Certificate in Information Technology (External)** will be awarded on successful completion of module examinations of the first year
- **An Advanced Certificate in Information Technology (External)** will be awarded to holders of the IT Certificate on successful completion of module examinations of the second year
- **Degree Certificate** will be awarded on successful completion of year 1, year 2 and year 3 examinations and fulfillment of other requirements.

While all necessary information pertaining to students reading for an external degree is included in this handbook, the ICT of the University of Colombo reserves the right to revise such information without prior notice.

4 Authorities Concerned with the External Degree (BIT) Programme

- The Council of University of Colombo
- The Senate of University of Colombo
- The Board of Management of ICT
- The Academic Committee of ICT
- The External Degrees Committee of ICT
- Board of Study on external degree
- Any other Board approved by the Senate

5 Admission Requirements

a) (i) Three passes in the G.C.E. (A/L) examination in one sitting and a credit pass for Mathematics in the G.C.E. (O/L) examination; **OR**

(ii)Three passes in the G. C. E. (A/L) examination in one sitting with one such pass being in one of the following subjects: Applied Mathematics, Pure Mathematics, Physics, Chemistry, Economics, Logic & Scientific Method, Commerce & Finance, Accountancy, Business Studies, Business Statistics, Geography **OR**

(iii) Any other academic/professional qualifications deemed equivalent by the Senate **AND**

b) Pass a ***selection test, which tests the analytical, quantitative and communication skills **AND**

c) Age: Not less than 17 years as at 30th of September of the first Year of Registration.

***Selection test**

- Medium –English
- Duration of the test-2 hours
- Type of the test-Multiple choice questions
- Test will be on analytical, quantitative and communication skills

5.1 Selection Procedure

Notices calling for the admission to the external degree (BIT) programme will be published in the press annually. In accordance with such notices, prescribed application forms should be forwarded to the External Examinations Unit (EEU) of the ICT on payment of appropriate fees (see Section 11) to one of the banks listed under Section 11.2.1.

6 Registration

Students selected will be informed to register for the external degree (BIT) programme. Registration is valid for a period of one academic year. The students have to pay the registration fee annually to keep their registration valid and sit for examinations.

6.1 Documents Required Prior to Initial Registration

a). Photo copies of the following:

- Birth Certificate
- G.C.E. A/L certificate
- G.C.E. O/L certificate

and

b). Original receipt of payment of Registration Fee for Year 1

and

c). Three recent colour photographs (passport size). Place your signature on the reverse of the photographs. (One such photograph & the photocopies of the above certificates should be attested by an *authorized person)

*(Head or Retired Head of a Government/Director Managed approved school, Grama Niladhari of the Division, Justice of Peace, Commissioner of Oaths, Attorney at Law, Notary Public, Commissioned Officer of the armed forces, Staff Officer of Govt./ Corporation, the Chief Incumbent of a Buddhist Vihara, A religious Dignitary of standing of any other religion)

The original certificates should be presented at the time of registration.

6.2 Registration Number

A student is given a registration number at registration. A temporary letter of registration is given to a student until an Identity Card (BIT) is issued. All inquiries regarding any matter pertaining to the external degree (BIT) programme must be accompanied by this registration number.

6.3 Identity Card (BIT)

The Identity Card (BIT) remains the property of the student until such time, the student obtains the Degree of Bachelor of Information Technology (External). Thereafter, the student should return it to the EEU of ICT. If the Identity Card (BIT) is lost, a duplicate will be issued on payment. For payments refer (Section 11). An affidavit should be produced to obtain the duplicate. Students will not be allowed to sit an examination without the ID (BIT).

6.4 Cancellation of Registration

Any student may at his request obtain cancellation of his student registration. In such an event the ICT will retain 25% of the registration fee provided a written request is made within 30 days from the closing date of registration. No requests for cancellation will be entertained from students awaiting the results of an examination or pending disciplinary action in respect of any examination malpractice. Registration of students who have been found to have submitted false documents would be cancelled.

6.5 Renewal of Registration

All students are required to renew their registration within a prescribed period after the release of results of Year 1, Year 2 and Year 3 examinations (if necessary). EEU of the ICT will send the registration forms along with the examination results. A student has no right or claim to sit any examination after expiry of period of registration. Hence a student whose registration has lapsed must apply for renewal through the prescribed form.

7. Course Structure

YEAR 1 - *8 Compulsory Modules*	
Compulsory 4	***Compulsory 4***
1.Mathematics for Computing I	1. Computer Architecture (CA)

	and Operating Systems (OS)
2. Fundamentals of Programming	2. Data Structures & Algorithms
3. Fundamentals of Computer Systems & PC Applications	3. Database Management Systems (DBMS)
4. Systems Analysis & Design	4. Fundamentals of Software Engineering

YEAR 2 - *4 Compulsory Modules & 4 Optional Modules*			
SEMESTER 3 - 4 Modules		***SEMESTER 4 - 4 Modules***	
Compulsory 2	***Optional 2/3***	***Compulsory 2***	***Optional 2/3***
1. Object Oriented Systems Development (OOSD) *	1. Operational Research (OR)	1. Data Communication & Networks	1. Professional Issues in IT
2. Mathematics for Computing II	2. Business Management	2.Rapid Application Development (RAD) *	2.Multi Media & Hyper Media Systems Development
	3. Web Development Techniques		3.Advanced Database Management Systems

YEAR 3 - *2 Compulsory Modules + Project & 4 Optional Modules*	
SEMESTER 5 - 4 Modules	***SEMESTER 6 - Project + 2 Modules***

Compulsory 2	*Optional 2/3*	*Compulsory 3*	*Optional 2/3*
1. Visual Computing	1. Intelligent Systems	1. Final Year Project (Equivalent to 3 Modules) Continues..	1. Internet Application Development
2. Project Management (PM) and Software Quality Management	2. Security of Information Systems		2. New Trends in Business Information Systems
Final Year Project Commences….	3. Systems & Network Administration		3. New Directions in Intelligent Systems

*** Modules with practicals**

8. Examinations

8.1 Medium

English

8.2 Application to sit the examinations

Applications for examinations will be entertained from prospective candidates who possess all the requisite qualifications. Refer examination criteria (see Section 8.3) for eligibility. Examination application forms will be available at the EEU of ICT. In the event of any candidate applying for two different examinations in the same year, separate applications must be submitted in respect of each examination.

Important

Examination Application will be rejected on the following grounds:

i) Not possessing all the requisite qualifications for the examination concerned

ii) Not applying on prescribed forms
iii) Not submitting the applications on or before the closing date of applications
iv) Invalid Registration
v) Non-payment of Registration and Examination fees
vi) Pending inquiries

8.3 Examination Criteria

Each compulsory and optional module examination will carry a maximum mark of 100%. Duration of a module examination is 2 hrs. In the case of the Year 1 module examinations and 3 hrs. in the case of the Year 2 & Year 3 module examinations.

No repeat examinations will be held.

The examinations leading to the award of the External Degree of Bachelor of Information Technology (BIT) will be held as follows:

8.3.1 First Year Examination

- Semester 1 - 4 compulsory module examinations
- Semester 2 - 4 compulsory module examinations

Any student who has a mark of 40 % or more in at least 6 compulsory modules at the First Year module examinations may proceed to and register for the Second Year

8.3.2 Second Year Examination

- Semester 3 - 2 compulsory and 2 optional module examinations
- Semester 4 - 2 compulsory and 2 optional module examinations

Any student who has a mark of 40% or more in at least 6 modules at the Second Year module examinations may proceed to and register for the Third Year

8.3.3 Third Year Examination

- Semester 5 - 2 compulsory and 2 optional module examinations
- Semester 6 - *project examination and 2 optional module examinations

*The project examination consisting of the project report, its presentation and the oral examination taken together will carry a maximum mark of 100.

The pass mark for the project examination is 50%

8.4 Grades

Grade "A"- a mark greater than or equal to 70%
Grade "B"- a mark greater than or equal to 55% and less than 70%

Grade "C"- a mark greater than or equal to 40% and less than 55%
Grade"D"- a mark greater than or equal to 30% and less than 40%
Grade "E"-a mark less than 30%

8.5 Examination Admission Forms

Before a minimum of two weeks prior to the commencement of the examination all eligible candidates to sit the relevant examination will be issued an admission form to that examination. In the event of a candidate not receiving such admission form he should inform the EEU of ICT immediately.

8.6 Other Requirements

Except under circumstances where special permission has been granted on the basis of acceptable medical grounds, each candidate must present himself for the examination on one and the same occasion for each module for which he has registered.

Those candidates who are referred or re-referred must of necessity obtain a pass in the relevant module/project examination in accordance with examination regulations.

A candidate shall not appear for any module examination on more than three occasions unless the Senate decides otherwise.

Medical	**Absent/failed**
Attempt - not counted	Attempt - counted

A student shall not re-sit a module examination, for which he/she has already obtained a mark of 40% or more. For the project examination this will be 50% or more.

8.7 Examination Rules and Instructions to Candidates

- A candidate when sitting an examination must at all times have in his possession his admission form and his ID (BIT). In case the ID (BIT) is not produced, when called for (at an examination), a student is liable to have his candidature cancelled. In the course of an examination, if by any chance the ID (BIT) is lost, steps must be taken immediately to inform the Project Manager of such loss and have a duplicate procured.

- If a candidate falls ill in such a manner as to prevent him/her sitting any module examination, an acceptable medical certificate from the University Medical Officer/a Registered Medical Practitioner must be submitted to the BIT authorities at the earliest possible time, so that it can be endorsed by the University Medical Officer, but in any case not later than one week from the first day of the examination.

- All candidates will be issued a detailed instruction sheet along with the examination application form.

In the event an examination malpractice is proved the following punishments are meted out:

- Cancellation of examination candidature
- Suspension/Cancellation of registration
- Debarring from sitting the examination for a stipulated period of time with or without a fine being imposed
- Any other punishment meted out by the University Senate

Some of these malpractices are:

- Having on one's possession or near oneself notes, diagrams, articles etc.
- Removing from the examination hall stationery, tables, etc.

supplied by the University
- Copying
- Impersonation
- Other forms of dishonesty and unruly behaviour

8.8 Release of Results

Each candidate will be informed personally of examination results subject to approval by the University Senate.

8.9 Re-scrutiny of Answer Scripts

Under no circumstances and for no reason what so ever will there be a re-scrutiny of answer scripts.

9. Award of the Degree of Bachelor of Information Technology (External) - BIT

9.1 Criteria for a Pass

a) A mark of 40% or more in each of the 14 compulsory module examinations other than the project **and**

b) A mark of 40% or more in each of the 6 optional module examinations **and**
a mark of 30% or more in each of the balance 2 optional module examinations
together with an average of 40% or more in the 8 optional module examinations **and**

c) A mark of 50% or more at the final year project examination containing the project report, its presentation and oral examination taken together.

A Student who fails to obtain a pass as indicated under criteria for a pass should re-sit for each such module examination and/or re-submit the project report and/or re-appear for the presentation/oral examination

9.2 Award of Classes

A candidate who has passed the Examinations leading to the Degree of Bachelor of Information Technology (External) - BIT may be placed in the First Class, Second Class (Upper Division) or Second Class (Lower

Division), as the case may be, on the results of the Examinations taken together.

In the case of a candidate who has failed to appear for an examination or failed to complete an examination on acceptable medical grounds, the question of awarding him a class will be considered only if he repeats the examination on one and the same occasion at the first available opportunity and passes that examination reaching a standard acceptable to the Board of Examiners in accordance with the examination regulations.

9.2.1 First Class

A student is eligible to be placed in the First Class if he/she has passed the Degree of Bachelor of Information Technology (External) as set out in section 9.1 and has:

(i) an average of at least 65% in all 14 compulsory module examinations, the project(equivalent to 3 modules) and the 8 optional module examinations taken together

and

(ii) a minimum of 8 "A" grades from the 16 module examinations in the 1st and the 2nd years and a minimum of 3 "A" grades from the 6 module examinations other than the project in the 3rd year

and

(iii) an "A" grade for the final year project.

9.2.2 Second Class (Upper Division)

A student is eligible to be placed in the Second Class (Upper Division) if he/she has passed the Degree of Bachelor of Information Technology (External) as set out in section 9.1 and has:

(i) an average of at least 60% in all 14 compulsory module examinations, the project(equivalent to 3 modules) and the 8 optional module examinations taken together

and

(ii) a minimum of 8 "A" or "B" grades from the 16 module examinations in the 1st and the 2nd years and a minimum

of 3 "A" or "B" grades from the 6 module examinations other than the project in the 3rd year

and

(iii) a minimum of an "A" or "B" grade for the final year project.

9.2.3 Second Class (Lower Division)

A student is eligible to be placed in the Second Class (Lower Division) if he/she has passed the Degree of Bachelor of Information Technology (External) as set out in section 9.1 and has:

(i) an average of at least 55% in all 14 compulsory module examinations, the project(equivalent to 3 modules) and the 8 optional module examinations taken together

and

(ii) a minimum of 8 "A" or "B" grades from the 16 module examinations in the 1st and the 2nd years and a minimum of 3 "A" or "B" grades from the 6 module examinations other than the project in the 3rd year

and

(iii) a minimum of an "A" or "B" grade for the final year project.

10. Certificates

10.1 Transcripts

Each candidate, whether he has passed or not, will be provided with a transcript giving details of the grades he had obtained and the final result including classes if any, provided that he makes an application & payment in the prescribed manner.

10.2 Degree Certificates

Degree certificates will be issued to graduates after approval by the

Senate, of results of the examination of the Degree of Bachelor of Information Technology (External) - BIT.

10.3 Certificates and Advanced Certificates

On successful completion of the module examinations of the first year a student will be awarded a **Certificate in Information Technology (External)**.

On successful completion of the module examinations of the second year, a student who has obtained a Certificate may be awarded an **Advanced Certificate in Information Technology (External)**.

11. Fees & Payment Method

11.1 Programme Fees (For Sri Lankan Citizens)

		Degree Programme		
	Pre-Registration	**Year 1**	**Year 2**	**Year 3**
1) Fees for Selection Test	**Rs.400 /=**			
3) Annual Registration Fee		**Rs. 1000 /=**	**Rs.1500/=**	**Rs.2000/=**
2) Examination Fee for Each module examination		**Rs. 800 /=**	**Rs. 900 /=**	**Rs.1000/=**
4) Fee for the project examination				**Rs.3000/=**
5) Detailed Syllabus		**Rs. 100 /=**	**Rs. 100 /=**	**Rs. 200 /=**

Fees in respect of referred and re-referred module/project examination (s) are same as above.

11.2 Miscellaneous Fees (For Sri Lankan Citizens)

1) To obtain a duplicate Identity Card	Rs. 100/=

(BIT)	
2) Transcript	Rs. 150/=
3) Certificate and Advanced Certificate in Information Technology	Rs. 200/= each
4) Degree Certificate	To be decided upon and announced later

NB 1. All payments should be made to the banks listed below on prescribed vouchers available at the EEU of ICT /Bank Branches (Please use 4 vouchers)
2. Cash/Money Orders/Postal Orders not accepted.
3. All fees are subject to revision.

11.2.1 Branches of People's Bank

Colombo Branches:
Borella, Thimbirigasyaya

Country Branches:
Ampara, Anuradhapura, Avissawella, Badulla, Bandarawela, Batticaloa, Chilaw, Galle Main St., Gampaha, Hambantota,Horana, Ja-ela, Jaffna University, Kalutara, Kandy, Kegalle, Kelaniya, Kurunegala, Matale, Matara Dharmapala Mw., Moratuwa, Negombo, Nugegoda City Br., Polonnaruwa, Ratnapura, Trincomalee, Vavuniya

11.3 Fees & Payment Method for Foreign Nationals

Available at the External Examinations Unit (EEU) of ICT

Appendix 1

SYLLABUS IN BRIEF

YEAR 1 – SEMESTER 1
Mathematics for Computing I – ***(Compulsory)***
Indices and logarithms Sets Logic Relations Functions Techniques of counting Probability
YEAR 1 – SEMESTER 1
Fundamentals of Programming - *(Compulsory)*
Introduction to programming languages Statements, Expressions, Comments, Variables and Data types Operators Arrays and Control Statements Objects and Classes Object Oriented Programming Concepts Applets Error Handling Multithreading Input and Output Programming Tools
YEAR 1 – SEMESTER 1
Fundamentals of Computer Systems & PC Applications *(Compulsory)*
Introduction to computers History of computers MS-Windows/DOS operating systems Word Processing Spreadsheet Applications Database Applications Creation & Presentation of Computer Graphics Multi-Media Tools & Devices CAD/CAM Applications Introduction to PC Networks & Internet

YEAR 1 – SEMESTER 1
Systems Analysis & Design - ***(Compulsory)***
Introduction Software Process Software Requirement Analysis and Specification Software Design Coding Testing Software Maintenance Computer Aided Software Engineering (CASE) Software Quality
YEAR 1 – SEMESTER 2
Computer Architecture & Operating Systems (OS) ***(Compulsory)***
Part A: review of digital logic, multi level machine concept, SPC & Von-Neumann architecture, uniprocessor system configurations, fetch-execute cycle, instruction sets & addressing modes, control unit structure, pipelines, hazards & resolution, RISC architecture features, memory systems, caches, fundamentals of multi processors. Part B: Operating system history & concepts, types of OS's (single/multi task, real time, distributed), processes: scheduling, synchronisation, mutual exclusion, process transition, deadlock, memory management: virtual memory, segmentation, paging & swapping, file systems: attributes, FAT & I-NODE systems, case studies:Windows NT & Unix
YEAR 1 – SEMESTER 2
Data structures & Algorithms - ***(Compulsory)***
Introduction to Data Structures Stacks Queues and Lists Trees Graphs Tables Running Time of an Algorithm Sorting Algorithms Searching Algorithms

YEAR 1 – SEMESTER 2
Database Management Systems (DBMS) **(*Compulsory)***
File organisation and access mechanisms Introduction to DBMS Data Model Database design process Data normalisation process and the normal forms Data Manipulation
YEAR 1 – SEMESTER 2
Fundamentals of Software Engineering - *(Compulsory)*
Introduction to System Design Environment System Development Life Cycle Requirement Analysis System Design and Modeling System Design Techniques Introduction to Object Modeling and Object Development System Implementation and Maintenance Documentation CASE Tools
YEAR 2 – SEMESTER 3
Object Oriented Systems Development (OOSD)* *(Compulsory)*
Object Oriented Concepts Visual Modelling using Unified Modelling Language (UML) Introduction to Objectory Software Development Process Creating Use Case Diagrams Identifying Classes, Packages and drawing a Class diagram Specifying Relationships Discovering Object Interaction Adding Behaviour and Structure Analysing Object Behaviour Checking the Model Designing the System Architecture Building the Iterations Object Oriented Programming A Case Study Using an Object Oriented CASE Tool

YEAR 2 – SEMESTER 3
Mathematics for Computing II - *(Compulsory)*
Matrices 2D and 3D Transformations Vectors Basic statistic

YEAR 2 – SEMESTER 3
Operational Research (OR) - *(Optional)*
Introduction to Operational Research Linear programming Duality theory and Sensitivity Analysis Transportation models Network models Queuing models Dynamic programming (Deterministic/Probabilistic) Game theory Simulation and its applications in O.R.

YEAR 2 – SEMESTER 3
Business Management - *(Optional)*
Evolution of Management Managerial Roles and Skills Planning, Organising, Leading, Controlling Organisational Structures & Behavior Marketing Motivation & Leadership Financial Accounting Double Entry Balance Sheet preparation Profit & Loss Statement Preparation Ratio Analysis Cost Accounting and Decision Making Managerial Economics Inventory Control

YEAR 2 – SEMESTER 3

Web Development Techniques - *(Optional)*
Introduction to the Internet The World Wide Web HTML: The lingua franca Client side programming Server side programming Dynamic HTML & XHTML Security aspects Miscellaneous topics
YEAR 2 – SEMESTER 4
Data Communication & Networks - *(Compulsory)*
Communication System Components Data Transmission Systems Standards in Data Communications Security in Data Communications OSI Reference Model and Network Architecture Local Area Networks TCP/IP Wide Area Networks Network Management Network Operating Systems
YEAR 2 – SEMESTER 4
Rapid Application Development (RAD)* - *(Compulsory)*
RAD concepts and visual programming tools Introduction to Visual Basic as a RAD environment Component development and reusability Reusability Database design and modelling tools Interest Integration Client/Server debugging Application development flexibility Application and development list Project using Visual Basic

YEAR 2 – SEMESTER 4
Professional Issues in IT – *(Optional)*
Introduction to legal concepts, legal requirements & standards, duties to client & employer, accountability for quality, timeliness & use of resources, confidentially of client information, public interest & privacy, avoiding computer misuse including hacking, virus infections & pornography, environmental protection duties to profession, intellectual property rights, patents & copyright, software licensing, human relationships & change management, contract issues & law, health & safety issues, IT & organisation of work, codes of practice, codes of ethics & codes of conduct (e.g. BCS, ACS, ACM), professional bodies.
YEAR 2 – SEMESTER 4
Multi Media & Hyper Media Systems Development *(Optional)*
Multimedia and Hypermedia Characteristics Light and Sound, Seeing and Listening Hardware Devices Software Environment Communication Theory and Developments Computer Science Fundamentals and Developments Design Considerations Software Engineering and management Considerations Legal and Social Issues Emerging Issues
YEAR 2 – SEMESTER 4
Advanced Database Management Systems - *(Optional)*
Data Models Query Optimisation Database Transactions and Recovery Procedures Concurrency control Database Security Client Server Computing Distributed Databases Deductive Databases Data Warehousing and Data Mining Commercial and Research Prototypes

YEAR 3 – SEMESTER 5
Visual Computing - *(Compulsory)*
Computer Graphics: Introduction Computer Graphics Systems Two dimensional graphics primitives Clipping, Windows and Viewports Two dimensional transformations Three Dimensional Graphics Three dimensional modelling Hidden line and surface removal Ray Tracing Introduction to VR **Image Processing:** Introduction and applications Image representation Image enhancement techniques Geometric Correction Fourier Transform based Image Processing Edge detection Boundary extraction Introduction to Computer Vision
YEAR 3 – SEMESTER 5
Project Management (PM) & Software Quality Management - *(Compulsory)*
Definition of a Software Project Planning and Scheduling the Project The Resource Allocation The Human Resource Aspect Contingency Planning Project Monitoring and Control Software Quality Assurance Configuration Management Health and Safety at work Software Maintenance

YEAR 3 – SEMESTER 5
Intelligent Systems - *(Optional)*
Foundational Issues in Intelligent Systems Search Techniques Knowledge Representation and Reasoning Natural Language Processing Knowledge Based Systems Computer Vision Optional Topics: Machine Learning & Robotics

YEAR 3 – SEMESTER 5
Security of Information Systems - *(Optional)*
Combating computer viruses & other malware, biometric security systems, steganography, methods of encryption, Vigenere, book ciphers, testing for prime numbers, significance of large prime numbers to cryptography, Euclidean algorithm, linear congruential method for generating pseudo-random numbers, generation of random & pseudo-random numbers, one time pads, the DES algorithm, attacks on DES & ways of strengthening, e.g. Triple-DES, solving key distribution problem using Diffie-Hellman algorithm, the RSA public-key algorithm, digital signatures, the IDEA algorithm, securing e-mail using PGP, securing web transactions using SSL, public-key infrastructure & certificate authorities, SET infrastructure & technology, issues of key escrow, other security issues, e.g. Tempest, human security, physical security, etc.

YEAR 3 – SEMESTER 5
Systems & Network Administration - *(Optional)*
Introduction to System Administration Configuring and Administration of Disk file systems Domains and workgroup concepts User Accounts Backing up and Restoring files Auditing Resources and Events Network Administration overview TCP/IP overview Network Layer and Routing Router Configuration

YEAR 3 – SEMESTER 6

Internet Application Development - *(Optional)*
programming concepts Distributed computing concepts XML: The new lingua franca Java: A platform for advanced application development Applications
YEAR 3 – SEMESTER 6
New Trends in Business Information Systems *(Optional)*
Introduction to e-commerce Standard EDI & e-commerce Web based business solutions E-commerce solutions & available techniques on implementation Procurement processes & standards in e-commerce Global & Local Business on the web Market research & management information through e-commerce Analysis of investment, traffic & revenue Internet marketing techniques Public policy & law related to e-commerce
YEAR 3 – SEMESTER 6
New Directions in Intelligent Systems - *(Optional)*
Introduction to learning Neural Networks Genetic Algorithms Agent Technology
YEAR 3
Final Year Project - Guidelines

***Modules with practicals**

1. **Introduction**

The dissertation project is an extended piece of individual work, occupying student's time from the end of the second year through to the second semester in of the third year. The student will work on a topic of interest, and will have regular meeting with the supervisor to discuss work. The student will write a formal report in a structured way along the suggested guidelines.

1.1 Project objectives

The project encourages and rewards individual inventiveness and application of effort. The project will develop student's ability to:

- Construct a project from initial ideas, via a thorough analysis of the problem
- Plan, schedule, monitor and control own work
- Work independently
- Defend ideas in discussions and presentations
- Use references - libraries and other information sources
- Apply tools and techniques from taught courses (e.g. design and project management tools)
- Present the findings
- Formal Report writing.

1.2 Time to be Spent on the Project

The project is equivalent to three modules. Student is expected to spend on average of at least 12 hours per week working on the project throughout semester 1 and semester 2 of the final year. Effective time management is student's responsibility. Devoting a regular time slot for the project work consistently throughout the year will help.

1.3 Selecting a Project

It is the responsibility of the student to identify a suitable project. A project should comprise of substantial individual work that will fulfil the project objectives as well as involve work to justify the time to be spent on the project.

There are many different types of project. We categorise them into two basic types, namely: the experimental & theoretical project and the design & implementation project. Some projects would combine features from more than one of these types. Annex "A" gives some example project topics.

Experimental & theoretical projects involve the investigation and evaluation of a new piece of technology (e.g. neural network

application). This would involve a substantial amount of testing and implementation and the application of scientific measurements and investigations to ascertain its properties and usefulness. Sometimes such projects would involve a lesser amount of implementation, but concentrate on introducing the relevant concepts with suitable examples, investigating further examples, making and testing conjectures, developing theorems and proofs, where appropriate, and assessing the results, with attention given in suitable cases and possible applications.

Design & implementation projects should involve the main activities associated with the design and implementation of a software engineering system: requirement analysis, specification, program design, implementation, system testing (including field testing and user comments), documentation and maintenance.

1.4 **Project Supervisor**

A student should have a project supervisor. The supervisor should be able to guide the student throughout the project. Student should identify the project supervisor when the project proposal is submitted. Annex "B" gives some guideline of persons who could be supervisors.

It is a formal requirement that the student regularly meet the project supervisor during the time of the project. Student should work independently but report work and seek guidance to ensure the correctness of the approaches. The student should agree on a timetable with information about methods of contact with the supervisor at the start of the project. Typically, a student should expect to meet with the supervisor for about half an hour per week/fortnight. Some supervisors would want to meet the student more often than this especially at the start of the project and at the writing stage. If the supervisor request, the student would also have to regularly submit short progress reports on the project work prior to the meeting (usually by email). These reports should record the main milestones of the project, discussing both successes and failures.

Note: Contents of this prospectus are subject to revision by the ICT without prior notice