

COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

Introduction

The College of Information and Communication Technologies (CoICT) is a result of the merging of the former School of Informatics and Communication Technologies (SICT) and the Department of Electrical and Computer Systems Engineering (ECSE) in the College of Engineering and Technology (CoET). The general objective for the merging of the two units was to concentrate UDSM efforts in the development of the knowledge and practical implementation in the field of ICT and through this, to become a centre of excellence in the provision of higher education, research and public services in this area. The College comprises the following units:

- ♦ Department of Computer Science and Engineering (CSE)
- ♦ Department of Electronics and Telecommunications Engineering (ETE)
- ♦ Centre for Virtual Learning (CVL)
- ♦ University of Dar es Salaam Information Technology Centre (UDITC)

The College offers the following undergraduate programmes:

- ♦ Bachelor of Science in Computer Science (B.Sc. Comp. Sci.)
- ♦ Bachelor of Science with Computer Science (B.Sc. with Comp. Sci.)
- ♦ Bachelor of Science in Electronics Science and Communication B.Sc. (ES)
- ♦ Bachelor of Science in Computer Engineering and Information Technology (B.Sc. CIT)
- ♦ Bachelor of Science in Telecommunications Engineering (B.Sc. Telecoms)

The College also runs the following higher degree programmes:

- ♦ Master of Science in Computer Science
- ♦ Master of Science in Health Informatics
- ♦ Master of Science in Electronics Engineering and Information Technology
- ♦ M.Sc. in Telecommunications Engineering
- ♦ Postgraduate Diploma in Electronics Engineering and Information Technology
- ♦ Doctor of Philosophy (Ph.D.)

In addition, the college offers the following non-degree programmes:

- ♦ Diploma in Computer Science
- ♦ Certificate in Computer Science

Regulations Governing the Award of a First Degree

(Refer to the reviewed (latest) regulations under DUS). The College of Informatics and Communication Technologies operates a semester system of studies. Each of its disciplines offers a variety of courses, including core courses, which are compulsory to students majoring in the subjects and optional courses. Each course is given a unit weighting according to the time devoted to it on the timetable. Fifteen one-hour lectures or 15 lectures or 15 two to three-hour practical classes, constitute one unit. Thus for example, a course consisting of 30 one-hour lectures and 15 three-hour practical classes is a three-unit course. Seminars and discussion groups are not counted in the weighting unless they make up more than one third of the total teaching hours in a course.

A. General Regulations

The general University Examination Regulations shall apply. In addition to these, College-specific regulations will also apply as detailed below.

- 1). The College of Information and Communication Technologies offers the following programmes:

- a). BSc in Computer Science (3 years)
 - b). BSc with Computer Science (3 years) with the following combinations:
 - i. Computer Science with Mathematics
 - ii. Computer Science with Physics
 - iii. Computer Science with Statistics
 - c). BSc in Electronic Science and Communication (3 years)
 - d). BSc in Computer Engineering and Information Technology (4 years)
 - e). BSc in Telecommunication Engineering (4 years)
2. All students must pass all core courses in their study programme.
 3. Each student shall register for courses totalling at least 30 units and at most 36 units per academic year.
 4. In addition to core courses required for his/her major subjects and Development Studies, a student may choose as an elective any course for which he/she can meet the prerequisite/co-requisite requirements and which is compatible with the teaching timetable (subject to regulation No. 5).
 5. At the end of the academic year every student shall, in consultation with his/her Academic Advisor, map out his/her course programme for the next year. A course programme shall be subject to approval by the Head of the Department in which the student intends to major and by the Principal of the College. The Principal's approval shall constitute formal enrolment for all the courses listed in the programme. For first year students, mapping of the course programme will be done during the orientation week.
 6. No student will be permitted to commence or withdraw from any course more than four weeks after the beginning of the semester, except where his/her enrolment in the unit ceases.
 7. Students may be admitted to the College of Information and Communication Technologies as transfer students (advanced standing status) provided that their previous work was done at an institution recognized by the University of Dar es Salaam. Such students must also provide a detailed syllabus of the courses done and transcript of the grades obtained.
 8. The maximum transferable load shall be 30 units (approximately one year's work). The degree classification of a transfer student shall be based on the best 90 units (or 120 units for a 4-year programme), both from University of Dar es salaam and the transferred units.

B. College-specific Examination Regulations Governing the Award of a First Degree

The College of Information and Communication Technologies (CoICT) operates a semester system of studies. The College offers 3-year and 4-year degree programmes. Each of its disciplines offers a variety of courses, including core courses, which are compulsory to students and optional courses. Each course is given a unit weighting according to the time devoted to it on the timetable. Fifteen one-hour lectures (or 15 lectures) or 15 two to three-hour practical classes, constitute one unit. Thus for example, a course consisting of 30 one-hour lectures and 15 three-hour practical classes is a three-unit course. Seminars and discussion groups will not count towards the units.

The following regulations are in addition to the General University Examination Regulations. The regulations shall apply to all programmes offered at the College, and where necessary, will be specified based on the duration of the programme (i.e. 3-year or 4-year programme).

9. Student performance shall be assessed continuously throughout the course. Except in the project, such coursework assessment shall include at least one test per semester and may also consist of laboratory reports and any other similar means approved by the CoICT Academic Committee. The weight of such Coursework Assessment for every course shall be 0.4. The weight for a University Examination in every course shall be 0.6; except that where a course is not subject to University Examination, Coursework Assessment shall have a weight of 1.0 in that semester.
10. It shall be the duty of the Head of Department concerned to inform the students at the beginning of the semester of the procedure of assessment in each course that shall be followed in that semester.
11. Each course will be offered and assessed in the same semester and a grade awarded. External examination and determination of pass or fail status however shall be done at the end of the academic year (i.e. at the end of the second teaching semester in each academic year).

12. Candidates are required to obtain a minimum overall GPA for the Academic Audit Unit (academic year) before they can directly proceed to the following year of study. The pass grade in each of the course taken shall be "C".
13. Supplementary examinations for the failed courses examined during the previous two semesters will be held once each year prior to the commencement of the academic year. The highest grade awarded shall be the minimum passing grade (i.e. "C").
14. A candidate who fails in a course that is assessed by coursework assessment only, shall sit for a written supplementary coursework assessment examination. Such examination shall take place at the time of the University Supplementary Examinations. All other rules and regulations governing supplementary examinations shall apply.
15. A student shall not repeat (carry over) any failed elective course, except in certain circumstances, normally when those units are needed to comply with minimum requirements for degree award as spelt out in ColCT Examination Regulation 21. Supplementary work in, or carry over of elective courses will only be allowed in exceptional circumstances, normally only when those units are needed to complete a degree programme.
16. Assessment of courses that are offered by other Colleges, Schools and Institutes of the University shall be governed by the regulations of the respective Colleges, Schools or Institutes.
17. A special examination in a course to be regarded as constituting a first sitting shall be given to a student who, for satisfactory reasons, was allowed by the Principal not to take regular examination. Normally, special examinations will be given at the time of supplementary examinations
18. A student who is required to sit for a special examination shall be assigned a "PEX" (Postponed Exam) grade and one who, for satisfactory reasons, has not completed his/her coursework shall be assigned an "I" (Incomplete) grade.
19. A student who has a "PEX" or "I" grade in a course during any academic year is required to clear the course examination during the time of special examinations for that academic year. Except with the approval of the respective College Board, a student who will not clear any "PEX" or "I" grade at the time of special examinations will be considered to have absconded studies and hence discontinued.
20. No student will be enrolled in a course for which he/she has not fulfilled the prerequisites. A course for which a "D" grade or lower is obtained shall not be counted as fulfilling a prerequisite for any course unless it is a course in the same series taken during the same semester.
21. To complete a degree programme at ColCT, a full-time student must have passed a minimum number of units, including all prescribed core courses as shall be prescribed by the respective Heads of Departments prior to the commencement of each semester. In this regard, students are required to register for and pass a minimum of 90 units for a three-year programme, and 120 units for a four-year programme, or as prescribed in the curriculum for any of the degree programmes offered by ColCT.
22. A student who has qualified to continue with his/her studies in terms of the minimum overall GPA for the Academic Audit Unit, but failed in some courses, will be allowed to sit for supplementary examination for all failed courses. A candidate who fails to attain an overall GPA of 1.8 at the end of the academic year shall be discontinued forthwith. A candidate who attains an overall GPA of 1.8 or above at the end of the academic year shall be allowed to supplement all failed courses. The highest grade awarded for a supplemented course shall be the minimum passing grade (i.e. "C").
23. If after taking supplementary examinations a student fails to obtain a "C" grade in a core course, or fails to clear all Supplementary Examinations but has an overall GPA of 2.0 in courses examined or otherwise assessed in semesters 1 and 2 of the academic year, may be allowed to repeat (carry over) the failed courses within the maximum period of registration.
24. If after taking supplementary examinations, a student fails to obtain an overall GPA of at least 2.0, she/he shall be discontinued from study in the University.
25. All carry-over courses must be cleared within the allowable maximum period of registration; otherwise the student will be discontinued from studies.
26. The maximum time for which a student may remain registered is 5 years for a 3-year programme and 6 years for a 4-year programme. Any student who is required to repeat/complete certain courses in

- order to qualify for the award of a degree shall be deemed to have failed the programme at the end of the maximum period if any of such courses have not been passed.
27. To be allowed to carry over a course in which an examination is part of the assessment, a student must first sit for supplementary examination in that course.
 28. Final Year Projects will be assessed and the results will contribute to the final year GPA, as well as final GPA for degree classification.
 29. Assessment of the Final Year Projects shall be based on a written Project Report and Oral Presentation of the Project work. Students shall submit error free copies of the Final Project Reports.
 30. The weight of Projects will be determined as for any other course, based on the number of contact hours.
 31. A candidate who fails in the Final Project shall be allowed to take a corresponding Supplementary Project. The time allocated for a Supplementary Project shall be 12 weeks after the release of the results.
 32. A candidate who fails to clear a Supplementary Project shall repeat the project in the first semester of the subsequent year.
 33. The final grades of all courses taken by a student shall be entered in the transcript.

Regulations on Practical Training in Industry (PT)

34. The College of Information and Communication Technologies runs a practical training programme in which students engage in practical activities related to their fields of study. Normally these activities are held in various industries and institutions outside the University. The PT programme seeks:
 - i). To expose students to the various research and/or production activities being carried out in different parts of the country;
 - ii). To enable students to apply their knowledge in practice;
 - iii). To ensure that, on leaving the University, graduates have acquired some appropriate work experience;
 - iv). To establish and maintain contact between prospective employers and the University in order to ensure that students are given the appropriate skills and knowledge for the jobs they are likely to be called upon to perform after graduation;
 - v). To enable prospective employers and employees to become acquainted with one another in a working environment.The following regulations shall apply for Practical Training:
35. For each degree programme, there shall be two PT sessions (or three PT sessions for a 4-year programme) each of 8 weeks duration. The PT shall be conducted after the end of the first and second academic year for the 3-year programme, and at the end of the first, second and third academic years for the 4-year programme.
36. Each PT shall be treated as a course of the succeeding academic year.
37. Each PT shall be assessed and the grade obtained shall count towards the final degree award. The total weight of the PTs will be determined as for any other course, based on the number of contact hours. Each PT will contribute 2 units.
38. A student who, for good reasons, could not complete PT to satisfy the respective College Board will be assigned an "I" grade for that PT and will be required to complete that particular part of the training within a certain period as will be specified by the College Board.
39. A student who could not complete PT for reasons other than those stipulated in 38 above, will be considered to have absconded the PT, and shall be discontinued.
40. Practical Training reports will be handed in for assessment before the end of the second week of the first semester.
41. Internal assessment shall be completed before the end of the first semester.
42. A student who fails in a PT shall supplement the PT before starting the next one, provided that his/her GPA in that major subject is 1.8 or higher.

43. A student who fails in a supplementary PT and has a GPA of less than 2.0 shall be discontinued forthwith.
44. Students who do not go to places allocated to them for PT without satisfactory reasons will be deemed to have absconded from their PT and will, as a result, be discontinued from their studies.
45. Students who go to the allocated PT places but refuse to follow the training programme will be deemed to have absconded and consequently shall be discontinued from studies.

PT Assessment

46. PT assessment will be based on the following items:

Employers Assessment	10%
Logbook	20%
Final Report	60%
Supervisor's Report	10%
TOTAL	100%

47. Assessment by the Employer shall include the following:

- i). Skills obtained by the student.
- ii). Attitude towards work.
- iii). Personal initiatives and independence.
- iv). Reliability in carrying out duties.
- v). Punctuality to work.

The Employer, using an assessment form shall grade the items listed below using the following weighting:

A = Excellent, C = Good,
B = Very Good, D = Fair, and E = Poor.

48. Assessment of Logbooks:

It is proposed that the logbooks should contain description of activities and tasks assigned to students, output from such activities and remarks by the employer. The employer shall sign the document on weekly basis. The logbook shall be submitted to the University supervisor together with the final report. The grading of the logbook shall be marked out of 20% based on the following:

- i). Clear description of activities 10%
- ii). Description of outputs 10%

49. Assessment of Final PT Report:

Grading of the report shall take into consideration the following distribution of marks.

- i). Description and analysis of tasks given 10%
- ii). Problem identification and scientific methods used 15%
- iii). Presentation of results and data 20%
- iv). Correctness of information (graphs, maps, drawings, etc) 10%
- v). Summary and conclusions 05%

Weighting of Results and Classification of Degrees

50. Computation of the average score for a degree shall be based on the minimum number of units required to complete the degree programme or the closest number marginally exceeding the prescribed minimum in cases where the number is not exactly achievable as follows:
- a) All the prescribed core courses.
 - b) The best units from the other core courses offered such as student's project(s) and the two (or three) practical training sessions in industry as well as elective courses.
51. The total weight factor of the minimum number of units obtained as stipulated in Regulation 50 shall be 1.0. The contribution of each course to this weight factor shall be proportional to its number of units as shown in the curriculum.

52. For purposes of classification of degrees, a five point system will be used to compute the final grade.

The letter grade will be assigned points as follows:

A=5; B+=4; B=3; C=2; D=1; E=0.

The ranges of the grades will be as follows:

A = 4.4 - 5.0 B+ = 3.5 - 4.3 B = 2.7 - 3.4

C = 2.0 - 2.6 D = 1.0 - 1.9 E = 0.0 - 0.9

Equivalent marks for each grade shall be as follows:

A = 70% - 100%; B+ = 60% - 69%; B = 50% - 59%; C = 40% - 49%;

D = 35% - 39%; E = 0% - 34%

53. To get a score for each course, the points obtained as in Regulation 52 above shall be multiplied by the weights as in Regulation 51.

54. All weights under Regulation 51 above shall carry one decimal place.

55. A student who has passed courses totalling more than 90 units in a 3-year programme, or 120 units in a 4-year programme, shall have one or more elective courses excluded from the assessment in the degree classification. The assessment shall in this case exclude those elective courses in which the student had the worst performance.

56. The average score for the degree will be based on the best 90 or 120 units as the case may be. The classification shall be as follows:

First class 4.4 - 5.0

Upper second 3.5 - 4.3

Lower second 2.7 - 3.4

Pass 2.0 - 2.6

Undergraduate Programme Courses

Department of Computer Science and Engineering

Common Core Courses for all Students

		Units
DS 101	Perspectives of Development I	2
DS 102	Perspectives of Development II	2

Common Optional Courses for all Science Students

DS 211	Entrepreneurship	2
SC 215	Science Methods	2

Service Course for non Computer Science Major

IS 131	Introduction to Informatics and Microcomputers	3
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B.Sc. (in Computer Science)

First Year (Double Major)

Course Code	Course Title	Units	Semester	Core/Optional
IS 142	Introduction to High Level Programming	3	1	Core
IS 151	Digital Circuitry	3	1	Core
IS 161	Basic Computer Applications	3	1	Core
MT 100	Foundations of Analysis	3	1	Core
MT 137	Discrete Mathematics	2	1	Core
IS 133	Systems and Organisations	2	2	Core
IS 138	Social-Cultural Implications of Information Technology	2	2	Core
IS 139	Introduction to Computer Architecture	3	2	Core
IS 136	Programming in C	3	2	Core
IS 137	Data Structures and Algorithms	3	2	Core

Course Code	Course Title	Units	Semester	Core/ Optional
MT127	Linear Algebra I	3	2	Core
IS 243	Practical Training I	2	2	Core
	<u>Total Units</u>	<u>32</u>		

Second Year (Double Major)

IS 271	Computer Networks	3	1	Core
IS 272	Software Development I	3	1	Core
MT 249	Mathematical Logic and Formal Semantics	3	1	Core
IS 245	Operating Systems	3	1	Core
EV 200	Environmental Science I	2	1	Core
IS 258	PC Maintenance	2	1	Core
IS 262	Compiler Technology	2	1	Optional
MT233	Mathematical Statistics I	3	1	Optional
IS 234	Human Communication and Information Systems	3	1	Optional
IS 292	Object Oriented Programming	3	2	Core
IS 263	Database Concepts	3	2	Core
IS 281	Network Design & Administration I	3	2	Core
IS 273	Unix Systems Administration in Linux OS	2	2	Core
MT274	Numerical Analysis I	3	2	Core
IS 343	Practical Training for Computer Science II	2	2	Core
IS 242	Introduction to Computer Graphics	3	2	Optional
IS 253	Introduction to GIS	2	2	Optional
IS 282	Software Development II	3	2	Optional
IS 254	Operating System II	2	2	Optional

Third Year (Double Major)

IS 391	Distributed Systems	3	1	Core
IS 333	System Analysis and Design	3	1	Core
MT338	Queuing Theory and Inventory Modules	2	1	Core
IS 342	Management and Control of Software Project	3	1	Core
IS 335	Final Year Project	2	1	Core
IS 334	Organization and Management of Information	2	1	Optional
IS 363	Introduction to Artificial Intelligence	2	1	Optional
IS 353	Implementation of Databases	3	2	Core
IS 335	Final Year Project	2	2	Core
IS 364	IT Security	2	2	Core
IS 383	Internet Application and Programming	2	2	Core
MT373	Mathematical Statistics II	3	2	Core
IS 352	Data Mining & Knowledge Discovery in Databases	3	2	Optional
IS 373	Introduction to Computer Simulation & Modeling	3	2	Optional

B.Sc. (with Computer Science)**First Year (Single Major with IS and MT + ST or PH)**

IS 142	Introduction to High Level Programming	3	1	Core
IS 161	Basic Computer Applications	3	1	Core
IS 139	Introduction to Computer Architecture	3	1	Optional
IS 136	Programming in C	3	2	Core
IS 137	Data Structures and Algorithms	3	2	Core
IS 243	Practical Training I	2	2	Core
MT 120	Functions of Single Variable	3	2	Optional

Second Year (Single Major with IS and MT + ST or PH)

IS 271	Computer Networks	3	1	Core
IS 245	Operating Systems I	3	1	Core
IS 272	Software Development I	3	1	Core
EV200	Environmental Science I	2	1	Core
IS 258	PC Maintenance	2	1	Optional
IS 242	Introduction to Computer Graphics	2	1	Optional
IS 292	Object Oriented Programming	3	2	Core
IS 263	Database Concepts	3	2	Core
IS 343	Practical Training II	2	2	Core
IS 281	Network Design & Administration I	3	2	Optional
IS 253	Introduction to GIS	2	2	Optional
IS 254	Operating System II	2	2	Optional
IS 282	Software Development II	3	2	Optional

Third Year (Single Major with IS and MT + ST or PH)

IS 333	System Analysis and Design	3	1	Core
IS 335	Final Year Project I	2	1	Core
IS 391	Distributed Systems	3	1	Optional
IS 334	Organization and Management of Information Systems	2	1	Optional
IS 342	Management & Control of Software Project	3	1	Optional
IS 363	Introduction to Artificial Intelligence	3	1	Optional
IS 353	Implementation of Databases	3	2	Core
IS 383	Internet Application & Programming	2	2	Core
IS 335	Final Year Project II	2	2	Core
IS 364	IT Security	2	2	Optional
IS 374	Introduction to Computer Simulation and Modeling	3	2	Optional

B.Sc. (in Computer Engineering and Information Technology)**First Year**

CL 111	Communication Skills for Engineers	2	1	Core
CS 171	Introduction to Computers and Programming in Pascal	2	1	Core
DS 101	Development Perspectives I	2	1	Core
PD 100	Engineering Drawing	2.5	1	Core
SD 105	Statistics	3	1	Core
MT 161	Matrices and Basic Calculus for Non-Majors	3	1	Core
DP 171	Fundamentals of Electrical Engineering I	2	1	Core
EG 110	Workshop Training I	3	1	Core
EG 120	Introduction to Entrepreneurship	1	2	Core
DS 102	Development Perspectives II	2	2	Core
MT 171	One Variable Calculus & Diff Equation for Non-Majors	3	2	Core
CS 172	Computer Programming in Pascal	2	2	Core
DP 172	Fundamentals of Electrical Engineering II	2	2	Core
EG 111	Workshop Training II	3	2	Core
ME 106	Strength of Materials I	2	2	Core
TE 171	Introduction to Electronics Engineering	3	2	Core

Second Year

CS 211	Measurements & Instrumentation Engineering I	3	1	Core
CS 231	Computer Programming in C	2	1	Core
DP 271	Electrical Network Analysis I	3	1	Core
DP 273	Engineering Electromagnetics I	2	1	Core
ME 215	Structure and Application of Electrical Materials	1	1	Core

<i>Course Code</i>	<i>Course Title</i>	<i>Units</i>	<i>Semester</i>	<i>Core/Optional</i>
MT 261	Several Variable Calculus for Non Majors	3	1	Core
TE 241	Analogue Electronic for Engineers I	3	1	Core
CS 241	Computer Networking I	2	1	Core
CS 212	Measurements and Instrumentation Engineering II	3	2	Core
CS 251	Introduction to Computer Engineering	3	2	Core
CS 232	Introduction to Object-oriented Programming	2	2	Core
DP 272	Electrical Network Analysis II	3	2	Core
DP 274	Engineering Electromagnetics II	2	2	Core
MT 271	Statistics for Non Majors	3	2	Core
TE 242	Digital Electronics for Engineers I	2	2	Core
CS 242	Computer Networking	2	2	Core
Third Year				
CS 321	Introduction to Control Systems Engineering	3	1	Core
CS 331	Introduction to Software Engineering	2	1	Core
CS 333	Computer Operating Systems	2	1	Core
CS 341	Network Routers and Routing	2	1	Core
CS 351	Computer Engineering I	2	1	Core
CS 353	Micro Computer System I	2.5	1	Core
CS 355	Computer Hardware	3	1	Core
DP 313	Power Electronics I	3	1	Optional
TE 311	Introduction to Analogue Telecommunications	3	1	Optional
DP 331	Electrical Power Plants	2	1	Optional
CS 322	Classical Control Systems Engineering	3	2	Core
CS 332	Object-Oriented Program Design and Analysis	2	2	Core
CS 342	LAN Switching	2	2	Core
CS 352	Computer Engineering II	3	2	Core
CS 354	Microcomputer Systems II	2.5	2	Core
TE 342	Digital Electronics for Engineers II	4	2	Core
DP 333	Introduction to Power Engineering II	2	2	Optional
DP 314	Power Electronics II	2	2	Optional
TE 312	Introduction to Digital Telecommunications	3	2	Optional
Fourth Year				
CS 421	Modern Control Systems Engineering	2	1	Core
CS 431	Data Base Systems	1	1	Core
CS 451	Computer Engineering III	3	1	Core
CS 452	Microcomputer Systems III	2	1	Core
CS 498	Final Project I	2	1	Core
DP 471	Electrical Safety & Maintenance	2	1	Core
TM 330	General Engineering Procedures	2	1	Core
TM 400	Engineering Ethics and Professional Conduct	1	1	Core
CS 480	Selected Topics in Computer Engineering & IT	2	1	Optional
DP 421	Electrical Insulating Materials	1	1	Optional
MG440	Engineering Economics	2	1	Optional
MG 441	Human Resources Management	2	1	Optional
CS 432	Software Testing and Software management	1	2	Core
CS 453	Computer Security	3	2	Core
CS 499	Final Project II	4	2	Core
MG445	Entrepreneurship for Engineers	3	2	Core
TE 442	Digital Electronics for Engineers	3	2	Core

Course Code	Course Title	Units	Semester	Core/Optional
TE 471	Introduction to VLSI	4	2	Optional
CS 434	Computer Graphics	1.5	2	Optional
CS 441	Wide Area Networking	2	2	Optional
CS 433	Introduction to Artificial Intelligence	2	2	Optional

NB: Candidates should consult with the department regarding the required minimum and maximum number of units in a semester.

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING

B.Sc. in Electronics Sciences and Communications

Common core courses for all students

Course Code	Course Title	Units
DS 101:	Perspectives of Development I	2
DS 102:	Perspectives of Development II	2

Common Optional Courses for all Science Students

DS 211:	Entrepreneurship	2
SC 215:	Science Methods	2

First Year

ES 102	Practicals in Electronics	2	1	Core
ES 110	Analogue Electronics I	2	1	Core
ES 115	Electromagnetics and Optics	2	1	Core
IS 136	Programming in C	3	1	Core
MT 100	Foundation of Analysis	3	1	Core
MT 127	Linear Algebra I	3	1	Core
IBM 100	Principles of Management and Administration	3	1	Optional
CL 107	Communication Skills for Scientist	2	1	Optional
ES 101	Technical Drawing, Laboratory and W/shop Administration	3	2	Core
ES 105	Fundamentals of Computer Architecture	2	2	Core
ES 120	Digital Electronics I	2	2	Core
MT 120	Analysis I: Functions of a Single Variable	3	2	Core
ES 240	Industrial Training	2	2	Core
IS 138	Social-Culture Implication of Information Technology	2	2	Optional
IS 137	Data Structure and Algorithms	3	2	Optional
<u>Total Units</u>		<u>27</u>		

Second Year

ES 211	Analogue Electronics II	2	1	Core
ES 212	Analogue Electronics Practicals	2	1	Core
EV 200	Environmental Sciences	2	1	Core
PH 201	Mathematical Methods I	2	1	Core
MT 233	Mathematical Statistics I	3	1	Core
IS 245	Operating Systems I	3	1	Optional
IS 262	Compiler Technology	2	1	Optional
IS 271	Computer Networks	3	1	Optional
ES 202	Quantum Electronics	2	2	Core
ES 221	Digital Electronics II	2	2	Core
ES 222	Digital Electronics Practicals	2	2	Core

Course Code	Course Title	Units	Semester	Core/ Optional
IS 292	Object-Oriented Programming Concepts	3	2	Core
ES 340	Industrial Training II	2	2	Core
IS 281	Network Design and Administration	3	2	Optional
IS 263	Database Concepts	3	2	Optional
ES 300	Computer Aided Design and Analysis	2	2	Optional
PH 202	Mathematical Methods II	2	2	Optional
PH 213	Electromagnetism II	2	2	Optional
MT 274	Numerical Analysis I	3	2	Optional
MT 227	Linear Algebra II	3	2	Optional

Third Year

ES 310	Electronics Instrumentation I	2	1	Core
ES 315	Signal Processing I	2	1	Core
ES 318	Electronics Control	3	1	Core
ES 399	Projects in Electronics I	2	1	Core
ES 399	Projects in Electronics II	2	2	Core
<i>Electronics stream</i>				
ES 300	Computer Aided Design and Analysis	2	2	Core
ES 304	Microelectronics	2	2	Core
ES 311	Electronics Instrumentation II	2	2	Core
ES 322	Solid State Electronics	2	2	Core
ES 316	PC Interfacing Techniques	2	2	Core
<i>Communication Stream</i>				
ES 324	Introduction to Wireless Communications	3	2	Core
ES 325	Signal Processing II	2	2	Core
ES 330	Telecommunication I	2	2	Core
ES 332	Opto-Electronics	2	2	Core
ES 314	Microprocessor Theory and Practices	2	1	Optional
ES 320	Nuclear Electronics	2	1	Optional
ES 322	Industrial Electronics	2	1	Optional
ES 337	High Frequency Communication System Design	2	1	Optional
TE 411	Microwave Communications	4	1	Optional
EV 300	Environmental Science II	2	1	Optional
ES 306	VLSI Circuit Design	2	2	Optional
ES 319	Communication Systems Design	2	2	Optional
ES 339	Ultra-Fast Electronics Techniques	2	2	Optional
ES 341	Communication Digital Signal Processing	2	2	Optional
ES 343	Emerging Electronics Technologies	2	2	Optional
IS 364	IT Security	2	2	Optional
IS 383	Internet Applications and Programming	2	2	Optional
TM 400	Engineering Ethics and Professional Conduct	1	2	Optional
MG 445	Entrepreneurship for Engineers	3	2	Optional

B.Sc. in Telecommunications Engineering

Common core courses for all students

DS 101	Perspectives of Development I	2	1	Core
DS 102	Perspectives of Development II	2	2	Core

Course Code	Course Title	Units	Semester	Core/Optional
First Year				
CL 102	Communication Skills for Engineers	2	1	Core
CS 171	Introduction to Computers and Programming in Pascal	2	1	Core
DP 171	Fundamentals of Electrical Engineering I	2	1	Core
PD 100	Engineering Drawing	2.5	1	Core
SD 105	Statics	3	1	Core
EG 110	Workshop Training I	3	1	Core
MT 161	Matrices and Basic Calculus for Non-Majors	3	1	Core
MG120	Introduction to Entrepreneurship	1	2	Core
CS 172	Computers Programming in Pascal	2	2	Core
DP 172	Fundamentals of Electrical Engineering II	2	2	Core
EG 111	Workshop Training II	3	2	Core
ME 106	Strength of Materials I	2	2	Core
MT 171	One Variable Calculus & Diff. Eq. for Non-Majors	3	2	Core
TE 171	Introduction to Electronics Engineering	3	2	Core
PT1	Practical Training 1	2	2	Core
	<u>Total Units</u>	<u>35.5</u>		
Second Year				
CS 211	Measurements & Instrumentation Engineering I	3	1	Core
CS 231	Computer Programming in C	2	1	Core
CS 241	Computer Networking I	2	1	Core
DP 271	Electrical Network Analysis I	3	1	Core
DP 273	Engineering Electromagnetics I	2	1	Core
ME 215	Structure and Application of Electrical Materials	1	1	Core
MT 261	Several Variable Calculus for Non-Majors	3	1	Core
TE 241	Analogue Electronic for Engineers I	2	1	Core
CS 212	Measurements & Instrumentation Engineering II	3	2	Core
CS 251	Introduction to Computer Engineering	3	2	Core
CS 232	Introduction to Object-Oriented Programming	2	2	Core
CS 242	Computer Networking II	2	2	Core
DP 272	Electrical Network Analysis II	3	2	Core
DP 274	Engineering Electromagnetics II	2	2	Core
MT 271	Statistics for Non-Majors	3	2	Core
TE 242	Digital Electronic for Engineers I	2	2	Core
PT2	Practical Training 2	2	2	Core
	<u>Total Units</u>	<u>40</u>		
Third Year				
CS 321	Introduction to Control Systems Engineering	3	1	Core
CS 353	Microcomputer Systems I	2.5	1	Core
CS 341	Network Routers and Routing	2	1	Core
TE 311	Introduction to Analogue Telecommunications	3	1	Core
TE 341	Analogue Electronics for Engineers II	4	1	Core
CS 342	LAN Switching	2	2	Core
TE 312	Introduction to Digital Telecommunications	3	2	Core
TE 313	Introduction to Switching and Transmission	2	2	Core
TE 342	Digital Electronics for Engineers II	4	2	Core
PT3	Practical Training 3	2	2	Core
	<u>Total Units</u>	<u>27.5</u>		
<i>Elective Courses (Minimum 6.0 Units)</i>				

Course Code	Course Title	Units	Semester	Core/Optional
CS 333	Computer Operating Systems	3	1	Optional
DP 313	Power Electronics I	2	1	Optional
DP 332	Electrical Power Plants	2	1	Optional
DP 333	Introduction to Power Engineering I	2	1	Optional
CS 322	Classical Control Systems Engineering	3	2	Optional
CS 332	Object-Oriented Program Design and Analysis	3	2	Optional
CS 354	Microcomputer Systems II	2.5	2	Optional
DP 314	Power Electronics II	3	2	Optional
DP 334	Introduction to Power Engineering II	2	2	Optional
TE 314	Introduction to Information Theory	2	2	Optional
<u>Total Units</u>		<u>24.5</u>		

Fourth Year

DP 471	Electrical Safety & Maintenance	2	1	Core
TE 411	Microwave Communication	4	1	Core
TE 413	Introduction to Telecommunications Networks	2	1	Core
TE 441	Analogue Electronics for Engineers III	4	1	Core
TE 498	Final Project I	2	1	Core
TM400	Engineering Ethics and Professional Conduct	1	2	Core
LW306	Law for Engineers	2	2	Core
MG445	Entrepreneurship for Engineers	3	2	Core
TE 412	Introduction to Wireless Communication	3	2	Core
TE 442	Digital Electronics for Engineers III	4	2	Core
TE 499	Final Project II	4	2	Core
<u>Total Units</u>		<u>31</u>		

Fourth Year

CS 421	Modern Control Systems Engineering	2	1	Core
CS 441	Wide Area Networks	2	1	Core
DP 421	Electrical Insulating Materials	2	1	Core
MG440	Engineering Economics	2	1	Core
MG 441	Human Resources Management	2	1	Core
TE 480	Digital Signal Processing (DSP)	2	1	Core
CS 452	Microcomputer Systems III	2	2	Core
TE 435	Introduction to VLSI	4	2	Core
TE 481	Television Engineering	2	2	Core
<u>Total Units</u>		<u>20</u>		

DIPLOMA PROGRAMME IN COMPUTER SCIENCE**1. Duration of the Diploma Programme**

The Diploma programme is designed for two years of which there will be four teaching semesters. Each semester has fifteen teaching weeks, as per University regulations. Since the Diploma programme is being proposed to run both as regular and evening programme, the following analysis will give the number of semester/weeks, which the evening program is supposed to cover.

Under semester system, there are fifteen teaching weeks, two weeks for examinations, and three weeks for holidays in the first semester.

Full-Time Diploma Students

On average, total number of lecture hours required for 12 courses is 16 per week. The practical hours required for seven courses which have practicals is 21 hours (3 hours per week per course) per week. On the average, a full time student requires $(16 + 21) / 5 = 7.4$ hours/day.

Part-Time Diploma Students

Start time: 4:00 pm to 8: 00 pm

Total time: 4hrs/day

For 5 days (4x5) 20 hours

Saturdays: 8:00 am 1:00 pm = 5 hours

Total time per week 25 hours/week

Full time students require 37hours/week; this implies that, part-time students require extra 12 hours per week, to accomplish the programme. For 30 weeks they will require $12 \times 30 = 360$ hours.

Number of weeks required: $360/25 = 14.4$ weeks. Thus for the part-time students, they will require five semesters to accomplish the Diploma programme.

2. Entry Qualifications and Regulations**2.1 Direct Entry**

- a) The Certificate of Secondary Education Examination (C.S.E.E) or East African Certificate of Education (E.A.C.A) - 'O' level with passes in at Least Four approved subjects including a pass in Mathematics.
AND
- b) One of the following combination of passes in the Advanced level Secondary Education Examination or the East African Certificate of Education ('A' level) or Equivalent:-
 - i) One Principal level pass in, Computer Science, Mathematics, Physics, Chemistry economics, Commerce, Geography, Accountancy, and a subsidiary pass in any of these subjects.
OR
 - ii) One Principal level pass grade 'C' and above in any of the subjects listed in b(i) above.
OR
 - iii) A Form VI certificate with at least two subsidiaries in the subjects listed in b (i) plus at least two years industrial experience.
OR
 - iv) A University of Dar es Salaam Certificate in Computer Science with an average GPA of at least 3.5.

2.2 Equivalent Qualifications

An Ordinary National Certificate or Diploma at a good standing or a qualification of an equivalent standard awarded by recognized bodies e.g. N.B.A.A. National Board of accountants and Auditors), B.E.C. (Business education Council), NACTE, etc. Certificate in computer science recognized by NACTE, and NECTA.

Course Structure

The list below consists of courses in the Diploma in Computer Science Programme:

Diploma Programme in Computer Science

Course Code	Course Title	Units	Semester	Core/ Optional
First Year				
IS 051	Introduction to Computer Science Mathematics I	2		
IS 052	Office Automation	2		
IS 053	Systems and Management Concepts	2		
IS 056	Operating Systems and their Configurations	3		
IS 061	Design and Implementation of Web Pages	2		
IS 063	Professional Issues in Information Systems Practice	2		
IS 064	Introduction to Computer Architecture	2		
IS 065	Data Structure	2		

<i>Course Code</i>	<i>Course Title</i>	<i>Units</i>	<i>Semester</i>	<i>Core/Optional</i>
IS 066	Internet Navigation	2		
IS 069	Information Systems Analysis and Design	2		
IS 131	Intro. to Informatics and Microcomputer Applications	2		
IS 132	High Level Programming with Pascal	3		
	<u>Total Units</u>	<u>26</u>		
Second Year				
IS 054	Introduction to Computer Science Mathematics II	2		
IS 055	Design and Implementation of Object Oriented Applications	3		
IS 057	Introduction to Database	2		
IS 058	Implementation of Database Systems Using DBMS	3		
IS 059	Network and System Administration	2		
IS 062	Business Statistics	3		
IS 067	Fundamentals of Computerized Accounting	3		
IS 068	Introduction to Project Management	2		
IS 242	Introduction to Computer Graphics	2		
IS 283	Electronics Commerce	2		
IS 220	Independent studies/Informatics Project I	4		
IS 071	Multimedia	2		Optional
	<u>Total</u>	<u>28</u>		

CERTIFICATE IN COMPUTER SCIENCE

Entrance Qualifications

A candidate, before being admitted to the course, will be required to have obtained the School Certificate of Secondary Education with passes in at least D in four subjects INCLUDING MATHEMATICS or An Advance Certificate of Secondary Education with at least two subsidiary passes. Other additional qualifications that demonstrate the candidate's ability to undertake the programs may also be considered.

Assessment

Each course will be assessed by written examination of two hours duration. A candidate who fails in a subject can re-sit that subject. The maximum number of re-sits for each subject is two. Maximum grade obtainable during re-sits is C. The grading system shall be as follows:

A = 70% - 100%; B+ = 60% - 69%; B = 50% - 59%;
C = 40% - 49%; D = 35% - 39%; E = 0% - 34%

Grade to points correspondence:

A = 5 points B+ = 4 points B = 3 points
C = 2 points D = 1 points E = 0 points

The pass mark in each examinable course shall be C.

Final Certificate Classifications

A candidate's final standing in Certificate in Computer Science shall be determined by the Aggregate Gross Point Average (GPA) for all two semesters of study. The final Certificate classification shall be as follows:

Certificate Class	GPA
Distinction	5.0-4.0
Credit	3.0-3.9
Passed	2.0-2.9

Course Structure

For this course there will be two streams: Software and Hardware.

Software Stream: These will specialize to assist software engineers and system administrators.

Hardware Stream: These will specialize to assist Network Administrators and Hardware Engineers.

To be awarded the certificate, a student must take and pass a minimum of 20 units over two semesters.

During the first semester, all candidates must take and satisfy the examiners in the following courses:

Course Code	CourseTitle	Units
IS 011	Introduction to Computer Hardware and Software	3
IS 022	Business Communication II	2
IS 033	Basic Computer Applications	3
IS 044	Computing Mathematics I	2
IS 077	Principles of Operating Systems	3
	<u>Total</u>	<u>13</u>

In the second semester, candidates must select a number of courses from the list of core/optional courses for each specialization. The number of courses selected must meet the minimum number of units required.

Software Stream Core Courses (Optional courses for Hardware Stream)

Course Code	CourseTitle	Units
IS 088	Web Fundamentals	3
IS 099	Management to Database Systems	3
	<u>Total</u>	<u>6</u>

Hardware Stream Core Courses (Optional Courses for Software Stream)

Code	CourseTitle	Units
IS 066	Introduction to Digital Logic and Digital Elements	2
IS 010	Introduction to Data Communications and Networks	3
	<u>Total</u>	<u>6</u>

Optional courses for all streams

Code	CourseTitle	Units
IS 055	Programming Basics	4
IS 030	Computing Mathematics II	2
IS 020	Network Operating System	3
	<u>Total</u>	<u>9</u>

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