SUBJECT REVIEW REPORT

DEPARTMENT OF PHYSICAL SCIENCES

FACULTY OF APPLIED SCIENCES
VAVUNIYA CAMPUS

18th to 20th May 2009

Review Team :

Prof. Sumedha Jayanetti, University of Colombo
Prof. W. D. W. Jayatilake, University of Sri Jayewardenepura
Dr. Prasad Jayaweera, University of Ruhuna

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1. SUBJECT REVIEW PROCESS

The need of a formal Quality Assurance process for Higher Education in Sri Lanka was recognized and introduced in the year 2000 by the Committee of Vice Chancellors and Directors (CVCD) of the state universities. With the assistance of several experts, a Handbook titled "Quality Assurance Handbook for Sri Lankan Universities" was prepared and jointly published by the University Grant Commission (UGC) and the CVCD in July 2002. After that the Councils and the Senates of Sri Lankan Universities accepted and agreed to conduct Quality Assurance activities in Higher Education Institutions under the guidelines given in the Handbook. The Quality Assurance and Accreditation Council (QAAC), established with the support of the IRQUE project, designed and introduced the procedures for the Quality Assurance process. The QAAC of Sri Lanka links to the state university system through the UGC Standing Committee for Quality Assurance (SCQA).

There are four types of review processes conducted by the QAAC.

1. Subject Review Process
2. Programme Review Process
3. Institutional Review process
4. Library Review process

The Subject Review Process and the Programme Review Process are designed to evaluate the quality of the undergraduate and post graduate programmes in higher Educational Institutions on the following eight aspects.

1. Curriculum design, content and review
2. Teaching, learning and assessment process
3. Quality of students, including student progress and achievements
4. Extent of student feedback- qualitative and quantitative
5. Post-graduate studies
6. Peer observation
7. Skills development
8. Academic guidance and counselling

During the review process the Review Team appointed by the QAAC critically evaluates the position of the eight aspects in the subject or the programme in line with the objectives specified by the Self Evaluation Report (SER) submitted by the relevant department. The Team makes judgments on each of the eight aspects as Good, Satisfactory or Unsatisfactory.

Review visit

Professor Colin N. Peiris, the quality assurance specialist of the QAAC by his letter dated 4th May 2009 appointed the following Review Team to perform a Subject Review of the Department of Physical Science, Faculty of Applied Science, Vavuniya Campus of the University of Jaffna from 18th to 20th May 2009.

1. Prof. Sumedha Jayanetti, Department of Physics, University of Colombo.
2. Prof. W. D. W. Jayatilake, Department of Chemistry, University of Sri Jayewardenepura.
3. Dr. Prasad Jayaweera, Department of Computer Science, University of Ruhuna

The Self Evaluation Report submitted by the Department was made available to the Review Team well in advance. Other documents related to Quality Assurance activities were made available during the Review.

The Review was conducted according to the schedule jointly prepared by the Review Team and the Head of Department.
During the visit the Team met the following officers, employees and individuals and discussed relevant matters.

1. Rector of the campus
2. Dean, Faculty of Applied Science
3. Head, Department of Applied Science
4. Permanent Academic Staff of the Department
5. Temporary Academic Staff of the Department
6. Supporting Staff of the Department
7. Student Counsellors of the Faculty and the Department
8. Programmer and the Network Engineer of the main computer centre
9. Librarian
10. Senior Student Counsellor
11. Director, Art and Cultural Centre
12. Undergraduate students of the Department

During the review the Team visited the following places.

1. Office of the Dean of the Faculty of Applied Science
2. Office of the Head of Department of Physical Science
3. Computer lab in the main building (70 computers)
4. Computer lab in the Department (17 computers)
5. Computer room in the Department (6 computers)
6. Lecture theatre 1 (60 seats)
7. Lecture theatre 2 (50 chairs)
8. Library
9. Chemistry laboratory
10. Physics laboratory
11. Student common room and the canteen
12. Cultural and sport division
13. Office rooms of staff
14. Instructors office room

During the visit the team observed the following activities.

1. Two lectures
2. Second year project presentation
3. Teaching in Computer Laboratories

During the visit the team observed the following documents.

1. Self evaluation report prepared for the Department.
2. Handbook, Faculty of Applied Science 2008-2009
3. Academic calendar- year 2007
4. Curriculum of the Department
5. Syllabi for courses conducted by the Department
6. Past examination papers and answer scripts
7. Papers moderated by external examiners
8. Papers marked by the first and the second examiners
9. Questionnaire and responses for Student Feedback
10. Questionnaire used for the Peer Observation

11. Results of the semester examinations
12. Performance of the degree programme
13. Documents on student counselling
14. Documents related to industrial training
15. Students' attendance
16. Appointments of visiting staff
17. Appointment of external examiners
18. Final year students' project reports

Review Judgment and Outcomes

The Review Team at the end of the three-day visit makes judgments on each of the eight aspects; Good, Satisfactory or Unsatisfactory. Review report will be prepared by the Team and submitted to the Department through the QAAC and the Standing committee of the UGC. If the Department does not agree with any comment or a judgment made by the Team it should be informed to the QAAC within a month of receiving the report. Such situations can be cleared through discussions and mutual understanding between the Department and the Review Team. If any review aspect is found to be unsatisfactory in the final report, an immediate action should be taken in order to rectify the situation. After accepting the report by the Department it will be published at the website of the QAAC.

2. BRIEF HISTORY OF THE UNIVERSITY, FACULTY AND THE DEPARTMENT

The University of Jaffna was started in 1974 as the sixth Campus of the University of Sri Lanka under the Universities Act No. 1 of 1972. Jaffna Campus of the University of Sri Lanka was named as the University of Jaffna in 1978 under the present Universities Act No. 16 of 1978.

Vavuniya Campus of the University of Jaffna was established in April 1997 by elevating the status of the Northern Province Affiliated University College of the University of Jaffna which was established in Vavuniya in 1991. At present the Vavuniya Campus consists of two Faculties, namely the Faculty of Applied Science and the Faculty of Business Studies.

The Faculty of Applied Science is situated in Kurumankadu about one kilometre from the Vavuniya town and will eventually be shifted to Pambai Madu where the whole of the Vavuniya Campus is to be housed in future. The Faculty of Applied Science of the Vavuniya Campus came into existence with the commencement of the two Departments namely Department of Physical Science and Department of Biological Science.

Academic Programmes

The Department of Physical Science has developed the academic programs in Applied Mathematics, Computing and Information technology. The first and second batches of students who followed diploma course in Mathematical Sciences were admitted to follow degree programme in 1998 and 1999 respectively. At present the Department conducts two three-year degree programmes and two four–year special degree programmes.

The degree program is based on the two semester system. Each academic year is considered as level 1, 2, 3 and 4 respectively. Each semester consists of a 15 weeks term of academic work.

Details of the programmes are given below.

Programme	Duration of the course	Level of study	Current number of students
B.Sc. in Applied Mathematics and Computing	3 years	Level 1 Level 2 Level 3	18 12 12
B.Sc. in Applied Mathematics and Computing (3+1, Extended fourth year)	4 years	Level 4	02
B.Sc. in Information and Communication Technology (BICT)	3 years	Level 1 Level 2 Level 3	62 08 04

Academic and Academic Support Staff

Academic and Academic support staffs are listed below with their responsibilities.

Permanent Academic Staff

No	Name	Post*	Year Appointed	Responsibility
1	Dr. J. C. N. Rajendra B.Sc. (Hons) (Jaffna), D.Phil. (Sussex-UK), CPhys, MInstP, MIPSL (*Resigned recently*)	Dean	2006	Teaching and administration responsibilities Faculty of Applied Science.
2	Mr. S. Kuhanesan B.Sc. (Hons) (Peradeniya), M.Phil. (Peradeniya)	HOD	1998	Teaching and administration responsibilities of Department of Physical Science. Student counsellor. Present Dean, Faculty of Applied Science.
3	Dr. S. Kanaganathan B.Sc. (Hons) (Cey.), M.Sc (Cey.), M.Sc (Liverpool-UK), Ph.D(Jaffna)	SL	2004	On sabbatical leave
4	Dr. S. Krishnakumar B.Sc.(Hons)(EUSL), PG.Dip. (USJP), Ph.D. (Perad)	SL	1995	Coordinator DICT Conducting Lectures and practical in charge for the respective course.
5	Mr. Senathirajah Selvarajan B.Sc. (Hons)(Jaffna), PG.Dip. (Peradeniya) M.Phil. (USJP)	SL	1992	Conducting Lectures and practical in charge for the respective course
6	Mr. B. Yogarajah B.Sc. (Hons) (Jaffna), PG.Dip.(Peradeniya)	L	1992	Conducting Lectures and practical in charge for the respective course
7	Mr. S. Jeyarajan B.Sc. (Hons) (Jaffna)	LP	2003	On study leave

8	Mr. T. Ketheesan B.Sc. (Hons) (Jaffna)	LP	2007	On study leave
9	Mr. S. Thirukumaran B.Sc. (Hons)(Jaffna)	LP	2007	Conducting Lectures and practical in charge for the respective courses.
10	Miss. Shakeela Selvarajah B.Sc. (Hons) (Jaffna)	LP	2007	Conducting Lectures and practical in charge for the respective courses
11	Mr.N.Sivchelvan B.Sc. (Hons) (Jaffna)	LP	2008	Conducting Lectures and practical in charge for the respective course
12	Mr.D.S.S.S.Suthaharan B.Sc.(Hons) Jaffna	LP	2008	Conducting Lectures and practical in charge for the respective course.
13	Mr.T.Mathialakan B.Sc.(Hons) (Jaffna)	LP	2008	Conducting Lectures and practical in charge for the respective course.

* Abbreviations for Designations: HOD - Head of Department, SL – Senior Lecturer,
L – Lecturer, LP – Lecturer Probationary

Academic Support Staff

No	Name	Year appointed	Designation
1	Mr. Sathasivam Selvarajan B.Sc. (Jaffna), M.Sc.(Colombo)	1992	Instructors
2	Mr. P. Mohan B.Sc. (Jaffna)	1995	Instructors
3	Mr.K.Pratheepan B.Sc. (Perad)	2007	System Engineer
4	Mr.S.Nithiyanandam B.Sc. (Jaffna), M.Sc. (UCSC)	2007	System Analyst
5	Mr. K. Jeyakhoban ACLT (OUSL)	2005	Technical officer
6	Mr.S.Kovintharajan	2008	Technical officer (Trainee)
7	Mr. S. Vinayagamoorthy	2001	Laboratory Attendant
8	Mr.Simon Lowrence Reginold	2001	Laboratory Attendant
9	Miss.R.Rajakumary	2008	Computer Application Assistant

3. AIMS AND LEARNING OUTCOMES

According to the Self Evaluation Report - the Department of Physical Science works towards achieving the Vision and Mission of the Faculty of Applied Science through providing up-to-date knowledge in Mathematics, Computer Science, Information Technology and Physics to undergraduate students through course work, practical classes and research projects.

3.1 Aims

According to the Self Evaluation Report - the Department has developed the academic programs in Applied Mathematics, Computing and Information Technology, with the revisions of the syllabi at regular intervals. Department has four disciplines namely Mathematics, Computer Science, Statistics and Physics. The course units cover wide range of Mathematical and Statistical topics. In addition, it covers wide spectrum of Information Technology aspects. The course units are designed in such a way to impart theoretical as well as practical knowledge.

Department intends to start degree programmes in B.Sc. in Applied Physics and Computing (three-year course) and B.Sc. Special (Physics) and B.Sc. Special (Computing) in year 2009. Department also has a plan to start a diploma programme in information technology (DICT) for external students.

3.2 Learning Outcomes

According to the Self Evaluation Report, on successful completion of the course of study in B. Sc. in Applied Mathematics & B. Sc. in Computing and Information & Communication Technology (BICT), student should have

a) gained knowledge and conceptual understanding of areas of his respective field of study based on programmes that provide initial broad frameworks followed by progressively increasing depth of study.
b) learnt how this knowledge and understanding can be applied to research.
c) developed a range of personal and transferable skills such as independence of thought, data handling and interpretation, computer literacy, oral and written communication, teamwork etc.
d) developed their ability for critical, self directed learning.

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

The Department of Physical Science was established in 1997 together with the commencement of the Vavuniya Campus of the University of Jaffna. Since then, the Department has developed academic programs in four major disciplines namely, Mathematics, Statistics, Physics, and Computer Science. Currently, the Department offers two general degree programs (six semesters) and two special degree programs (eight semesters). The two general degree programs are B.Sc. (Applied Mathematics and Computing) and Bachelor of Information and Communication Technology. The two special degree programs are B.Sc. (Special) in Computer Science and B.Sc. (special) in Information and Communication Technology.

Three more new degree programs; B.Sc. in Applied Physics and Computing (6 semesters), B.Sc. (Special) in Applied Physics (8 semesters), and B. Sc (Special) in Computing (8 semesters) have been proposed by the Department in addition to a diploma program in Information and Communication Technology (DICT) for external students. Further, the Department offers a variety of programs to the community such as teacher training programs, different awareness activities on demand. This range of programs could be considered as the maximum utilization of the available limited resources in the Department, especially when

planning for above seven degree programs to run in parallel with only 3 senior lecturers (out of one on sabbatical leave), one lecturer and seven probationary lectures. Therefore, one of the top priorities that the Department should pay attention is to strengthen (with the number and with the qualifications) its human resources for smooth operations of the above study programs.

The first syllabus of the Department of Physical Science degree program was drafted in 1998. The last curriculum revision for the two current general degree programs and the two special degree programs were completed in 2007. The Review Team noted strong focus on computer science sections together with applied mathematics in the present curriculum. It is recommended to follow ACM and IEEE guidelines for computing curricula at forthcoming revisions through which inclusion of more Information Technology (IT) and Information Systems (IS) sections could also be considered to the existing curriculum.

However, availability of non-credit valued auxiliary courses in the curriculum is noted by the Review Team as a positive aspect that could develop wide spectrum to soft skills among produced graduates. The Department may consider renaming the course titles with generic names to carry titles that could reflect the actual course contents. Also the integration of practical components together with course units consisting relevant theories is recommended rather than offering all practical parts as in a single course units.

During the future curriculum revisions Department may consider participation and input from various important stakeholders such as relevant industry and alumni.

In the curriculum, the faculty of applied science has defined exit points at each level and the Review Team considers this as a good practice. At the completion of level I together with fulfilment of pre-defined evaluation criteria, students have the option to leave the program with a Certificate in Applied Science. At the end of level II, they have the option of getting Diploma in Applied Science. Finally they have the options; at the end of level III a General Degree and at the end of Level IV, a Special Degree. However, no evidence was found by the Review Team about the demand and employability for certificate and diploma holders.

It is the view of the Review Team that the present state of the Curriculum Design, Content and Review adopted by the Department can be judged as GOOD.

4.2 Teaching, Learning and Assessment methods

Availability of faculty handbook with course details, evaluation system, examination rules, schedules, services and facilities is a positive aspect. In addition to the faculty handbook, the faculty organizes orientation programs for students those who start degree programs in the Faculty. Through these orientation programs also students are educated and equipped with necessary skills to follow the study program successfully.
Lectures, practical classes and tutorials are the main modes of delivery of the content in the curriculum. Faculty of Applied Science of Vavuniya Campus conducts all of its degree programs in English medium at all levels and thereby attracting students from all ethnic groups in different regions. Majority of lectures are conducted using chalk & board. Handouts are distributed among students and that facilitate understanding subject matters discussed in lectures. Lecturers motivate student-teacher interactions inside class rooms though student responses were unsatisfactory as noted by the Review Team. However, the

Review Team observed adaptation of incomplete handouts that get completed during lectures by students as a positive approach to get student participation in teaching –learning process.

Being a department with a majority of junior lecturers, the Review Team noticed the necessity of having more qualified staff not only in the disciplines but also with experiences in different pedagogical approaches to effectively deliver lectures. Arranging more and more staff development activities through the Staff Development Centre within the campus could improve staff's teaching skills.

In the prevailing context, another challenge that the Department faces is to retain qualified senior staff in the region. Provisioning of services and necessary facilities such as quarters, healthcare and schools for their kids may be considered as a remedy for this. The Review Team also noticed the difficulties that are faced by the Department with senior staff those who have started new study programs and left the campus. The introduction of Learning Management System could not only improve the internal lecture delivery but also external collaborations in content delivery.

The Department together with the campus offers variety of services to facilitate students to follow selected degree programs and also to develop range of soft skills. These services are offered through English Language Teaching Unit, Main Library, Cultural and Sports division etc. are also geographically dispersed due to lack to space and housing facilities. This situation further hinders easy accesses for students to these facilities and services. However, initiatives have been taken to move the entire campus to Pambai Madu with sufficient enough space to set necessary housing and other service centres. It is strongly recommended by the Review Team to take necessary action to shift the Campus to Pumbai Madu as early as possible.

There are compulsory practical course units in the Department's degree programs to provide an opportunities for students to practice concepts learned in theory classes and enhance their IT skills. Enforcement of maintaining students' practical record books is considered as a good practice through which students get prepared for the practical class and also to revise the content of completed practicals. In addition to the final year students' projects, some course units consists of mini-projects that students have to complete, to present and to submit reports. The colloquium that is organized by the campus not only provides an opportunity for staff but also for students to present their findings and share knowledge with others. Through all these activities students are given greater opportunity to get their soft skills developed. The Department has made attempts to find suitable industrial placements for all the students. However, Vavuniya being an area with the absence of subject related industries makes the placement process very difficult.

Assessment methods

The Department of Physical Science of Vavuniya Campus has adopted different assessments methods to evaluate students' level of achievements of intended learning outcome through its study programs. These assessments methods are based on the subject taught as well as the mode of teaching. For most of course unit end-semester examinations are used as the main assessment method. However, in some course units, in-course assessments such as assignments, short examinations, presentations and mini projects are also included. These in-course assessments provide an opportunity to evaluate not only direct-subject related matters but also other skills such as presentation skills and team-work. The Review Team got an

opportunity to observe a presentation of a min-project completed within Software Engineering course unit.

In addition, the Department has included considerable amount of compulsory practical units into its curriculum to provide students with hands-on experience on subject matters learning through its study programs. These practical course units are evaluated through 60 % weight from the in-course assignments and 40 % weight from the end-semester practical examination. This practical assessment method could be considered as a positive adaptation through which students realize the importance of attending practical classes and submission of in-course continuous assessments.

It is the view of the Review Team that the present state of the Teaching, Learning and Assessment methods adopted by the Department can be judged as SATISFACTORY.

4.3 Quality of Students including Student Progress and Achievements

Similar to other national universities, students for the Faculty of Applied Science of the Vavuniya Campus are also selected by the UGC based on their Z-score. Only the upper fraction of the students qualified for higher studies are admitted to the national universities. These students, similar to those in other universities, have shown good performance at their A/L examination. Upon entering the Faculty, the students are exposed to the academic programs of the Faculty in a systematic way.

Students in general maintain a high attendance to their classes (around 80 %) and have a success rate of over 80 % in passing their examinations at the first attempt. Curriculum design has incorporated ingredients to improve the quality of the students academically and in terms of the skills. Review Team had a lengthy meeting with all the students of the Physical Science stream. Majority of them showed good communicative skills and all of them showed a keen interest towards achieving their future goals. Most of the students were of the view that insufficient facilities in the Campus affect the quality of the students to some extent. One of the other concerns of the students was the insufficient availability of the senior academic staff members to conduct their academic programs and contribute to improve their quality.

It is the view of the Review Team that the present state of the Quality of Students including Student' Progress and Achievements of the Department can de judged as GOOD.

4.4. Extent and use of Student Feedback

Very recently in this year the Department of Physical Science of Vavuniya Campus has started getting students' feedbacks. Students' feedback have been collected, summarized and interpreted. The Review Team noted that this as a positive evidence for the acceptance of the student feedback process by the Department. However, the formalization and continuation of this practice is needed. The Team was unable to locate any evidence of documentation and/or of conveying students the follow-up actions taken by the Department in return. The Department has used informal varied feedback forms for different course units. Adaptation of formal and standard unified feedback form is recommended to improve efficiency and streamline the feedback collection, interpretation and follow-up action processes with some flexibility to customize for individual course/lecturer requirements.

As per the University Act No. 16 of 1978, two students represent the student community of the faculty in the Faculty Board. The Review Team noted that these student representatives attend the Faculty Board meetings regularly. The Review Team noted that it is also important to introduce standard practices in collecting students' feedback and to improve interaction with students' community. In this respect, Department can form a staff-student committee at the departmental level, for mentoring and academic counselling services.

It is the view of the Review Team that the present state of the Extent and Use of Student Feedback, Qualitative and Quantitative of the Department could be judged as GOOD.

4.5. Postgraduate Studies

The Department of Physical Science of Vavuniya Campus has not yet introduced any post-graduate study programs. This is mainly due to the current situation with the lack of qualified senior staff and other necessary facilities such as buildings and laboratories, etc.

However, several junior staff members at the Department are following postgraduate programs at other universities in order to obtain the mandatory requirement for their confirmation and for promotions. This is encouraging and they could also consider the continuation of their postgraduate research activities within the Department as well.

The Department is advised to start research collaborations with other national and international institutes especially through established networks. Through such collaborations the Department has an opportunity to commence joint postgraduate programs such as M.Phil. and Ph.D. for junior academic staff specially in the areas of Computer and Information Technology. This will in return help to develop human resources and research activities of the Department. However, the Vavuniya Campus Annual Research Sessions provide an opportunity for staff and students to present and get published their research and development work.

It is the view of the Review Team that the present state of the Post –Graduate Studies of the Department can be judged as UNSATISFACTORY.

4.6. Peer Observations

Evidences were found to confirm that the Department has identified the importance of the Peer Observation process. Some lecturers have entered into the process with the support of their colleagues. They have developed a record sheet to record the findings of the activity. Through discussions with the staff the Team understood the immediate requirement of a training programme to educate them on principles and the practices of the Peer Observation process. The unavailability of sufficient number of senior staff seems to be one of the barriers for further development of the Peer Observation activities in the Department. However, it is the view of the Team that the Faculty can initiate a systematic Peer Observation process rather than the departments in the situation. Further, the Faculty or the University has not yet developed a Code of Ethics for Academic Staff which is very important and effective for smooth running of the Peer Observation Process.

It is the view of the Review Team that the present state of the Peer Observation adopted by the members of the staff can be judged as SATISFACTORY.

4.7. Skills Development

The campus is equipped with a good computer laboratory that can be utilized to enhance IT skills of the undergraduates of the Department with properly designed programs. The Department has incorporated a number of useful and important course units to their curriculum with the view of improving IT skills of students. Certain number of courses has also been incorporated in the curriculum to enhance the communication skills of and social harmony among the students. Department has taken steps to provide some of the students, mainly the special students, with industrial training at local institutions/centres.

Review Team also found that the Campus has formed an Arts and Cultural Association that enables the students to engage in cultural activities and help promote their team spirit and leadership skills. Major set back that the Review Team encountered was the lack of facilities and availability of space for students to engage in outdoor sports events even though the students show an interest. This issue was brought to the notice of the Team at the meeting with the students. With the available limited resources and the curriculum design, the Department has taken commendable measures to develop skills of the students.

It is the view of the Review Team that the present state of the Skills Development of the Department can be judged as SATISFACTORY.

4.8. Academic Guidance and Counseling

Students of the Faculty get the services of Student Counsellors appointed by the campus. However, the Review Team did not find a mechanism to guide and counsel the students in a more systematic manner. It was found that there were no formally appointed Professional Counsellors, Academic Advisors or Personal Tutors in the Department of Physical Science even though the academic staff will voluntarily be available to assist students in situations where the academic guidance is required. It was observed that one academic staff member attached to the English Language Teaching Unit has been given the major responsibility to attend to the matters related to Student Counselling and encourage the students to engage in Arts and Cultural activities and other skills development programs.

It is the view of the Review Team that the area of academic guidance and counseling can further be strengthened by appointing Professional Counselors, Academic Advisors and Personal Tutors. This will help attend the problems and the needs of students in a more meaningful manner.

It is the view of the Review Team that the present state of the Academic Guidance and Counselling of the Department can be judged as SATISFACTORY.

Based on the observations made during the study visit by the review team, the eight aspects were judged as follows:

Aspect Reviewed	Judgment Given
Curriculum Design, Content and Review	Good
Teaching, Learning and Assessment Methods	Satisfactory
Quality of Students including Student Progress and Achievements	Good
Extent and Use of Student feedback, Qualitative and Quantitative	Good
Postgraduate Studies	Unsatisfactory
Peer Observation	Satisfactory
Skills Development	Satisfactory
Academic Guidance and Counseling	Satisfactory

5. CONCLUSIONS

The strengths/ good practices and the weaknesses of each of the eight aspects considered in the subject review process are summarized as follows.

1. Curriculum Design, Content and Review

Good Practices/Strengths:

1. Strong Computer Science (CS) curriculum with some Electronics Engineering (EE) and Computer Engineering (CE) components.
2. Considerable amount of course units are available to develop students' soft skills and knowledge in areas other than the relevant discipline as well.
3. Curriculum revisions have been carried out on regular basis.
4. Making some of skill enhancement auxiliary courses such as English compulsory to award degrees.
5. Provision of different degree programmes for students to select a programme of their interests.
6. Availability of exit points at each level [certificate, diploma, B.Sc. (general) and B.Sc. (special)].
7. Offering joint major degree programs.

Weaknesses/Opportunities

1. Department could consider consultation of IEEE and ACM guidelines in future curriculum revisions.
2. There is room to introduce more Information Technology (IT) and Information Systems (IS) parts into the curriculum.
3. In a given semester, all relevant practical components of theory course units are offered in a single practical course unit.
4. Titles of some practical course units as well as theoretical course units do not reflect the relevant content.
5. No evidence for consulting important stakeholders such as employers and alumni in the curriculum revision process.

6. No much flexibility in selecting course units.

2. Teaching, Learning and Assessment Methods

Good Practices/Strengths:

1. Conducting an orientation programme which includes information about the curriculum at the beginning of degree program.
2. Sufficient facilities such as multimedia projectors, white boards, are available for delivering lectures.
3. Uniform and clear assessment criteria.
4. In addition to end-semester assessment, in-course assessments including mini-projects and other assignments are considered for final grading.
5. Moderation of end-of-course assessments by external examiners, especially from reputed overseas universities.

Weaknesses/Opportunities

1. Students' interaction with the teacher during the lecture is not satisfactory.
2. Students are not clear about intended learning outcomes for course units.
3. Due to separation of practical sessions from relevant theory units, students may pass only the theory module and fail the practical component or vice versa which is undesirable for majority of Computer Science course modules.
4. There are more opportunities to develop teaching skills, mainly of junior staff for effective lecture delivery.

3. Quality of Students, including Student Progress and Achievement

Good Practices/Strengths:

1. Low drop out rate of students who are keen to pursue studies

Weaknesses/Opportunities:

1. Insufficient facilities in some areas such as practical skills in certain disciplines to improve the quality of students.
2. Lack of confidence among students due to unavailability of more senior staff.

4. Extent and Use of Student Feedback

Good Practices/Strengths:

1. The Department has started recently in this year collecting and summarizing students' feedback for some courses
2. Two students representatives have been appointed to represent students community at the Faculty boards

Weaknesses/Opportunities

1. No formal standard form has been developed to collect students' feedback.
2. A mechanism could be introduced to collect, summarize, interpret and convey students' follow-up actions taken.

5. Postgraduate Studies

Good Practices/Strengths:

1. Some of the senior staff members are involved in postgraduate supervisions at other universities.
2. Research activities of some staff and students members have also been published in different forums.

Weaknesses/Opportunities:

1. No actions have still been taken to introduce formal postgraduate studies due to lack of human resources and other facilities.
2. The Department has not still fully utilized existing national and international network in strengthening its research and postgraduate studies.

6. Peer Observation

Good Practices/Strengths:

1. Accept and entered into the process.

Weaknesses/Opportunities:

1. Lack of senior staff.
2. Unawareness of the correct procedures that should be adopted for Peer Observation.
3. Unavailability of background supportive procedures such as proper record sheets, Code of Ethics for teachers etc. that should be developed at the Faculty level and the Campus level.

7. Skills Development

Good Practices/Strengths:

1. Availability of well equipped computer laboratory to develop the IT skills of students.
2. Incorporation of non-credit course units in the curriculum to develop soft skills of the students.

Weaknesses/Opportunities:

1. Unavailability of sufficient space and facilities to develop skills related to team work and leadership building.
2. Absence of fora such as Science Societies except for student union and arts and cultural association to improve the quality of students in terms of soft skills.

8. Academic Guidance and Counseling

Good Practices/Strengths:

1. Relatively young staff in the Faculty is voluntarily available for guidance of students

Weaknesses/Opportunities:

1. No well formulated scheme involving professional counsellors, academic advisors or personal tutors for academic guidance and counselling.
2. Need of further distribution such responsibilities among more staff.

6. RECOMMENDATIONS

1. Department could consider consultation of Computing Curricula guidelines in future curriculum revisions as recommended in IEEE and ACM .
   (please visit, http://www.acm.org/education/curricula-recommendations)
2. Integration of practical components with relevant theory course units is recommended.
3. Make provision in the curriculum to teach new developments in the field and reflect it in the transcripts.
4. Introduce IT, IS and business related computing course units with higher industrial demand into the present curriculum in collaboration with Faculty of Management Studies as well.
5. Revise the titles of some of the course units to reflect the content.
6. Consult important stakeholders such as employers and alumni in the curriculum revision process.
7. Take action to increase the flexibility in selecting course modules for degree programs.
8. encouraging students to interact more freely with lecturers within as well as outside the class room.
9. introducing more staff development activities to improve teaching capabilities for effective lecture delivery.
10. providing course descriptions including course content, learning outcomes, assessment criteria and recommended texts at the beginning of the course module.
11. Recruitment and retention of senior qualified staff to maintain the quality of students.
12. Improve the laboratory facilities to provide more hands-on experience in practical skills.
13. Encouraging good student achievements by recognizing them with the Faculty level awards.
14. Distribution of well structured formal questionnaire to collect students feedbacks on the contents, quality of teaching and the areas for improvement at the end of each module.
15. Establishing staff-student committees, mentoring and academic counselling services.
16. Installing a suggestion-box for students put comments and opinion in a suitable place at the Department could increase unbiased students responses.
17. Establishing a proper mechanism to document and also to convey the students the follow-up actions taken on their feedbacks.
18. Conducting research activities leading to M.Phil. and/or Ph.D. degrees in collaboration with other local and international universities.
19. Utilization of the established networks national and international universities to conduct research at the Department that also leading to postgraduate degrees.
20. Awareness programmes are required to introduce the correct procedures and practices for Peer Observation activities.
21. Due to the lack of senior staff in individual departments, a Faculty level involvement is required for the development of Peer Observation activities.
22. A Code of Ethics for academics should be considered as a prerequisite for effective Peer Observation activities and should be introduced at the Campus level. Introduction of Code of Ethics for other employees should also be considered for the enhancement of Quality of the Institute.
23. Establishing a Career Guidance Unit that can formally help students to further develop
24. their personality development skills.
25. Extension of industrial placement beyond Vavuniya region to accommodates areas suitable for curriculum.

26. Establishing a scheme involving professional counselor/s, academic advisors or personal tutors for academic guidance and counseling.
27. Improve the academic environment of the Faculty at the earliest in order to remove the present congestion.

7. ANNEXES

Annex 1. AGENDA FOR THE REVIEW VISIT

18th May 2009

8.30 – 900 am	Self Introduction
9.00 – 9.15 am	Address by the QA Specialist Prof.Colin Peiris
9.15 – 9.30 am	Address by the Dean FAS
9.30 – 10.00 am	Refreshment
10.00 – 10.30am	Address by the Head DPS
10.30 – 1.00am	Observation of Documents in the Department
1.00 – 2.00pm	Lunch
2.00. – 3.30 pm	Observation of Department Facilities
3.30 – 4.30 pm	Discussion with Student Counsellor

19th May 2009

9.30 – 10.15 am	Observation of Lecture (LH 4) – Design of Experiment
10.15 – 10.30 am	Refreshment
10.30 – 11.30 am	Practical Demonstration (BICT Lab)
11.30 – 1.00 pm	Discussion with Permanent Academic Staff Temporary Academic Staff Non Academic Staff
1.00 – 2.00pm	Lunch
2.00 – 3.00 pm	Observation of Lecture (LH 4)
3.00 – 3.15 pm	Student Presentation (PHY)
3.15 - 4.30pm	Discussion with Student Representative (Level 1 to Level 4)

20th May 2009

9.00 – 10.00 am	Discussion with Student Counsellors
10.00 -10.30 am	Refreshment
10.30 – 11.30 am	Observation of Lecture (LH 4) – Numerical Computing -1
11.30 – 12.00 am	Discussion with Permanent Academic Staff
12.00 – 1.30 pm	Lunch
1.30 – 3.00 pm	Document Writing

Annex 2. CURRICULUM

(a) B.Sc. (Applied Mathematics and Computing)

LEVEL 1	For General Degree course			
Course Number		Title	Number of Credits	
Semester I	AMA 1113	Differential Equations	03	16
	PMA 1113	Foundation of Mathematics	03	
	STA 1113	Statistical Theory	03	
	COS 1112	Fundamental Concepts in Information Technology	02	
	COS 1122	Practical for Fundamental Concepts in Information Technology	02	
	COS 1132	Introduction to Programming Using C++	02	
	COS 1141	Practical for Introduction to Programming Using C++	01	
	*ACU 1110	English language I	00	
	*ACU 1120	General Biology	00	
Semester II	AMA1213	Mechanics	03	14
	PMA 1213	Analysis and Number Theory	03	
	COS 1212	Numerical Computing I	02	
	COS 1221	Practical for Numerical Computing I	01	
	COS 1233	Advanced Programming Using Java and C++	03	
	COS 1242	Practical for Advanced Programming Using Java and C++	02	
	*ACU 1210	Communication Skills	00	
	*ACU 1220	Sri Lankan studies, Social Harmony and Natural Resources of Sri Lanka	00	
* Auxiliary Course Units are treated as non-credit valued course units as they are not taken for the computation of the GPA. However all the auxiliary course units shall be evaluated and considered for the award of degrees .				

LEVEL 2	For General Degree course			
Course Number		Title	Number of Credits	
Semester I	PMA 2112	Liner Algebra with applications	02	15
	PMA 2121	Practical for Liner Algebra with applications	01	
	AMA 2113	Methods of Applied Mathematics	03	
	AMA 2123	Vector Calculus& Field Theory	03	
	STA 2113	Statistical Analysis	03	
	COS 2112	Data Structures and Algorithms	02	
	COS 2121	Practical for Data Structures and Algorithms	01	
	*ACU 2110	English language II	00	
Semester II	AMA 2212	Fundamentals of Optimization	02	15
	AMA 2223	Elementary Fluid Dynamics	03	
	AMA 2231	Practical for Fundamentals of Optimization	01	
	STA 2212	Design of Experiments	02	
	STA 2221	Practical in Statistical systems	01	
	COS 2212	Numerical Computing II	02	
	COS 2222	Data Base System	02	
	COS 2231	Practical for Data Base System	01	
	COS 2241	Practical for Numerical Computing II	01	
	*ACU 2210	Career Guidance	00	
* Auxiliary Course Units are treated as non-credit valued course units as they are not taken for the computation of the GPA. However all the auxiliary course units shall be evaluated and considered for the award of degrees.				

LEVEL 3	For General Degree course			
Course Number		Title	Number of Credits	
Semester I	AMA 3113	Modelling	03	15
	AMA 3123	Mathematical Programming	03	
	STA 3112	Regression Analysis & Time Series	02	
	STA 3121	Practical for Regression Analysis & Time Series	01	
	COS 3113	Software Engineering	03	
	COS 3122	Operating Systems	02	
	COS 3131	Practical for Operating Systems	01	
	*ACU 3110	Management and Entrepreneurial skills	00	
Semester II	PMA 3213	Algebraic Structures and Complex Variables	03	15
	AMA 3213	Analytical Dynamics	03	
	STA 3213	Applied Statistics	03	
	COS 3213	Internet Programming	03	
	COS 3222	Computer Systems	02	
	COS 3231	Practical for Computer Systems	01	
* Auxiliary Course Units are treated as non-credit valued course units as they are not taken for the computation of the GPA. However all the auxiliary course units shall be evaluated and considered for the award of degrees.				

LEVEL 3	For Special Degree in Computer Science			
Course Number		**Title**	**Number of Credits**	
Semester II	SCOS 3213	Knowledge Based System (KBS) and Logic Programming	03	**09**
	SCOS 3223	Parallel Computing	03	
	SCOS 3232	Practical for Knowledge Based System (KBS) and Logic Programming	02	
	SCOS 3241	Practical for Parallel Computing	01	
Those who are following special degree course in Computer Science should take all the Computer Science courses offered in general degree level 3 semester II and the special Computer Science courses offered in level 3 semester II (i.e should take - COS 3213, COS 3222, COS 3231, and SCOS 3213, SCOS 3223, SCOS 3232, SCOS 3241).				

LEVEL 4	For Special Degree in Computer Science			
Course Number		**Title**	**Number of Credits**	
Semester I	SCOS 4113	Advanced Numerical Analysis	03	**15**
	SCOS 4123	Combinatorial Mathematics and Graph Theory	03	
	SCOS 4133	Networking Basics	03	
	SCOS 4143	Object Oriented Analysis and Design	03	
	SCOS 4153	Computer Graphics and Image processing	03	
Semester II	SCOS 4213	Compiler Design	03	**15**
	SCOS 4223	Theory of Computation	03	
	SCOS 4232	Numerical Solution of Partial Differential Equations-Finite Element Method	02	
	SCOS 4241	Practical for Numerical Solution of Partial Differential Equations-Finite Element Method	01	
	RPRO4215	Project and Seminar	05	
	INTR 4211	Industrial Training (3 weeks)	01	

(b) B.Sc. (Information and Communication Technology)

LEVEL 1				
Course Number		Title	Number of Credits	
Semester I	ICT1113	Discrete Structures	03	15
	ICT1122	Fundamentals of Computer Systems	02	
	ICT1132	Introduction to Program Design and Programming	02	
	ICT1142	Object Oriented Program Design	02	
	ICT1152	Practical for Fundamentals of Computer Systems	02	
	ICT1162	Practical for Introduction to Program Design and Programming	02	
	ICT1172	Practical for Object Oriented Program Design	02	
	*ACU 1110	English language I	00	
Semester II	ICT1213	Data Structures	03	15
	ICT1223	Basic Electronics and Digital Logic Design	03	
	ICT1233	Operating Systems	03	
	ICT1242	Practical for Data Structures	02	
	ICT1252	Practical for Basic Electronics and Digital Logic Design	02	
	ICT1262	Practical for Operating Systems	02	
	*ACU 1210	Communication skills	00	
	*ACU 1220	Sri Lankan studies, Social Harmony and Natural Resources of Sri Lanka	00	
* Auxiliary Course Units are treated as non-credit valued course units as they are not taken for the computation of the GPA. However all the auxiliary course units shall be evaluated and considered for the award of degrees.				

LEVEL 2				
Course Number		**Title**	**Number of Credits**	
Semester I	ICT2113	Mathematics for Computing	03	**15**
	ICT2122	Design and Analysis of Algorithms	02	
	ICT2133	Software Engineering	03	
	ICT2142	Visual Computing (Rapid Application Development)	02	
	ICT2152	Practical for Design and Analysis of Algorithms	02	
	ICT2161	Practical for Software Engineering	01	
	ICT2172	Practical for Visual Computing (Rapid Application Development)	02	
	*ACU 2110	English language II	00	
Semester II	ICT2212	Operational Research	02	**15**
	ICT2222	Database Design	02	
	ICT2232	Computer Networks	02	
	ICT2243	Computer Graphics	03	
	ICT2252	Management Information Systems	02	
	ICT2262	Practical for Database Design	02	
	ICT2272	Practical for Computer Graphics	02	
	*ACU 2210	Career Guidance	00	
* Auxiliary Course Units are treated as non-credit valued course units as they are not taken for the computation of the GPA. However all the auxiliary course units shall be evaluated and considered for the award of degrees.				

LEVEL 3				
Course Number		**Title**	**Number of Credits**	
Semester I	ICT3113	Advanced Database Management Systems	03	**15**
	ICT3122	Project Management	02	
	ICT3133	Project	03	
	ICT3142	Human Computer Interaction	02	
	ICT3152	Server Management	02	
	ICT3162	Practical for Advanced Database Management Systems	02	
	ICT3171	Practical for Human Computer Interaction	01	
	*ACU 3110	Management and Entrepreneurial skills	00	
Semester II	ICT3213	Knowledge Based System (KBS) and Logic Programming	03	**15**
	ICT3222	Internet Security	02	
	ICT3232	Multimedia and Web development	02	
	ICT3242	Internet Computing	02	
	ICT3252	Practical for Knowledge Based System (KBS) and Logic Programming	02	
	ICT3262	Practical for Multimedia and Web development	02	
	ICT3272	Practical for Internet Computing	02	
* Auxiliary Course Units are treated as non-credit valued course units as they are not taken for the computation of the GPA. However all the auxiliary course units shall be evaluated and considered for the award of degrees.				

LEVEL 4				
Course Number		**Title**	**Number of Credits**	
Semester I	ICT4113	Computer Architecture and Assembly Language Programming	03	**15**
	ICT4122	Bio Informatics and Computational Biology	02	
	ICT4132	Mobile Computing	02	
	ICT4142	Advanced Computer Networks	02	
	ICT4152	E-Commerce	02	
	ICT4161	Practical for Computer Architecture and Assembly Language Programming	01	
	ICT4171	Practical for Bio Informatics and Computational Biology	01	
	ICT4181	Practical for Mobile Computing	01	
	ICT4191	Practical for E-Commerce	01	
Semester II	ICT4213	Parallel and Cluster Computing	03	**15**
	ICT4222	Advanced Networking Technologies I (Routing)	02	
	ICT4232	Advanced Networking Technologies II (Switching)	02	
	ICT4242	Agent Technology	02	
	ICT4252	Seminar/Presentation	02	
	ICT4261	Practical for Parallel and Cluster Computing	01	
	ICT4271	Practical for Advanced Networking Technologies I (Routing)	01	
	ICT4281	Practical for Advanced Networking Technologies II (Switching)	01	
	ICT4291	Practical for Agent Technology	01	