SUBJECT REVIEW REPORT

DEPARTMENT OF MATHEMATICAL SCIENCES

FACULTY OF APPLIED SCIENCES
SOUTH UNIVERSITY OF SRI LANKA

16th to 18th February 2009

Review Team :

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1. SUBJECT REVIEW PROCESS

A key factor required to promote and safeguard public confidence in Sri Lankan higher education university is accountability for quality and standards. As higher education is a public good, universities must conscientiously exercise their responsibility for quality and standards. The subject review is one of the components of the external quality assurance programme carried out in Sri Lankan universities It evaluates the quality of education within a specific discipline. It is focused on evaluating the student learning experience, student achievement and the teaching learning process at the subject level.

Key features of the subject review process include the critical analysis of the self evaluation report prepared by the academic department concerned, peer observation of teaching, observation of documents, observation of the facilities available, and gathering information on activities towards quality assurance through conducting discussions with as many stakeholders as possible. Subject reviews evaluate how the teaching-learning process helps in the achievement of intended learning outcomes.

Peer observation carried out during the review process includes observing teaching both in the theory and laboratory classes, and if possible in the field classes. The documents that are observed include, examples of student work, student handbooks, student handouts, lesson guides, statistics on student achievements and progress, samples of answer scripts, external examiners reports, peer evaluation reports, student evaluation reports, minutes of Departmental committees etc. The stakeholders with whom the discussions are carried out include the Head of the department, members of the academic and non-academic staff, undergraduate students, postgraduate students, alumni, academic administrators, and student counselors.

The subject review is carried out to evaluate the success of the processes employed to achieve the aims and intended learning outcomes stipulated in the self-evaluation report.
In the subject review process, the following eight aspects are evaluated.

- Curriculum design, content and review
- Teaching, learning and assessment methods
- Quality of students including student progress and achievements
- The extent and use of student feedback, qualitative and quantitative
- Postgraduate studies
- Peer observation
- Skills development
- Academic guidance and counseling

The review team consisted of the following members

- Dr. Prasad Jayaweera (Senior Lecturer, Department of Computer Science, University of Ruhuna)
- Dr. T.S.G. Peiris (Senior Lecturer, Department of Mathematics, University of Moratuwa)
- Dr. (Ms.) N.D.K. Dayawansa (Senior Lecturer, Department of Agricultural Engineering, University of Peradeniya)
- Professor Ranjith Premalal De Silva (Professor and Head, Department of Agricultural Engineering, University of Peradeniya)

Prof. Ranjith Premalal De Silva served as the Review Chair.

The Quality Assurance and Accreditation Council of the University Grants Commission provided three weeks in advance, the copies of the Self Evaluation Report prepared by the Department of Mathematical Sciences of the South Eastern University of Sri Lanka to the review team. The review team studied the self-evaluation report and carried out the complete review process during February 16-18, 2009.

On 16th morning, the review team met the Dean / Faculty of Applied Sciences and Head / Department of Mathematical Sciences. It was informed that the Vice-Chancellor is unable to attend the meeting due to another series of meetings held at the main campus. In addition to the review team, the meeting was attended by Prof. Kalyani Perera and Prof. Colin Peiris.
First, the review team finalized the agenda for the review process with Head of the Department and the Dean of the Faculty. The Agenda for the review visit is given in Annexure 1. After finalizing the agenda, the review team met the Head of the Department and other members of the academic staff. At this meeting, the Head of the Department explained the contents of the Self Evaluation Report which was followed by a discussion. The review team had discussions with the members of the academic staff, technical officers & non-academic staff, demonstrators who are the alumni of the Department, student counselors, directors of career guidance centre & staff development centre and the present undergraduates following the B.Sc. General Degree Programmes. The list of persons met is given in the Annexure 2.

Several documents were also perused. These included the Faculty handbooks, handouts given to students, minutes of the Departmental meetings, answer scripts, question papers, student feedback forms, etc. The complete list of the documents examined is given in Annexure 3.
The review team also examined the facilities available for teaching and learning. These included the lecture theatres, teaching laboratories, equipments etc. The team also visited the Oluvil campus and examined the facilities and the support from the main campus.

On the final day, the review team gave a feedback of the findings to the Dean of the Faculty of Applied Sciences, Head of the Department and other members of the academic staff.

2. BRIEF HISTORY OF THE UNIVERSITY AND THE DEPARTMENT

The Faculty of Applied Sciences (FAS) is one of the leading faculties of the South Eastern University of Sri Lanka (SEUSL).

The SEUSL was first established as the South Eastern University College of Sri Lanka and commenced its function on July 27, 1995. It was then upgraded to the status of a fully-fledged university, SEUSL from May 15, 1996. The other three faculties in the university are Faculty of Arts & Culture, Faculty of Management & Commerce and Faculty of Islamic Studies and Arabic which are located in the main site of the university at Oluvil.

The FAS of the SEUSL was established in 1997 at Sammanthurai. It consists of three departments namely Biological Sciences, Physical Sciences and Mathematical Sciences.

Vision of the University

To be a Centre of Excellence for creation, enhancement and dissemination of knowledge of national relevance and international recognition and to achieve social harmony among communities.

Mission of the University

To develop high caliber personnel of analytical and inquiring mind, leadership qualities, high ethical and moral values with ability to face challenges, in a changing environment addressing regional and national needs living harmoniously among diverse groups of people, in a conducive physical environment for creation and dissemination of knowledge, facilitating social interaction between the University and the community and achieve international repute with the support of committed and competent staff

Objectives of the Faculty

a) To offer undergraduate and postgraduate courses in Applied Sciences with particular emphasis on fields of technological importance.
b) To promote higher education and research to contribute towards national development.
c) To foster public understanding in science and technology.

The department of Mathematical Sciences is one of the three departments of the faculty of Applied Sciences. This department has three divisions: namely division of Applied Statistics, division of Computer Science and division of Mathematics. Division of applied statistics offers applied statistics as main subject, division of computer science offers computer science as main subject and division of mathematics offers applied mathematics and pure mathematics as main subjects to the Bachelor of Science (B.Sc.) general degree programme. The division of computer science also offers a special degree programme in computer science at the Academic Programme Center (APC), Mount Laviniya, Colombo with the service of the visiting lecturers from the UCSC, Colombo and other Universities. The department also offers some co-courses for all three year students.

At present the undergraduate students from the department offer the following subject combinations to obtain the B.Sc. general degree programme:

Physical Science Stream:
Applied Mathematics, Computer Science, Physics
Applied Mathematics, Computer Science, Pure Mathematics
Applied Mathematics, Pure Mathematics, Physics
Chemistry, Computer Science, Physics
Computer Science, Earth Science, Physics
Pure Mathematics, Computer Science, Applied Statistics

Biology Stream:
Biology, Chemistry, Computer Science
Biology, Chemistry, Earth Science
Biology, Computer Science, Earth Science
Biology, Computer Science, Applied Statistics

Students must select one of the above subject combinations during the first two academic years. In the third academic year, they have the option to drop one subject and select an optional course to cover the equivalent number of credits or proceed with the same subjects.

From the academic year 2007/2008, the following subject combinations have been introduced:

First Main Subject	Second Main Subject	Third Main Subject
Biology	Applied Statistics	Computer Science
Mathematics I	Chemistry	Earth Science
	Physics	Mathematics II

Students have to choose one subject from each column. There will be no optional courses at the third year of study. In other words, they have to follow their chosen subject combinations for all three academic years.

The special degree programme in Computer Science commences at the end of the third year general degree programme. The students are selected based on their performances in all three years of study. The special degree programme is consists of three semester, in which the first semester is called the interim semester. The courses taught in this interim semester are the special degree courses for the third year of study. Students must complete 48 credits for this special degree programme. So far two batches of students have completed and the third batch is now following this special degree programme at APC, Colombo.

There are eleven permanent academic staff, one permanent and six temporary academic supporting staff and two permanent and two temporary non-academic staff are in this department. Among the permanent academic staff, there are four senior lecturers of grade-II and seven probationary lectures.

Mission of the Department

To produce high quality science graduates with analytical thinking, research capabilities and leadership qualities to face challenges in the field of science and technology.

3. AIMS AND LEARNING OUTCOMES

3.1. Aims

The aims of the department are to provide an analytical thinking and wide knowledge in Pure and applied Science. Pure mathematics is the core of the analytical thinking and decision making. Theories in pure mathematics are very essential tools for the development of science and technology. The department encourages the students to follow pure mathematics as one of their main subjects and advise them the importance of this subject. The biology students are also allowed to follow the statistics and computer science as main subjects. Especially the computer science is the most demanding subject in this faculty. The department does not impose any barrier on their stream of study: weather they are biology or physical science students.

The department of Mathematical sciences is the key contributor in the faculty of applied sciences. Almost all students offer at least one subject from this department.
The aims of the department are:

1. Teaching theoretical science and explain the importance and application of pure science courses.

2. Encourage students for analytical and critical thinking, logical reasoning, independent learning and the development of their intelligence.
3. Improving their knowledge in applied science filed by teaching statistics and computer science subjects.
4. Providing IT knowledge for all science students.
5. Providing practical applications and knowledge in applied science by conducting practical in statistics and computer science.
6. Providing chances in postgraduate studies and academic section by offering computer science special degree course.
7. Provide a friendly and supportive learning environment. This will encourage them to work towards higher achievements of individual learning objectives.
8. Offer a range of learning opportunities and develop necessary skills to work in challenging environments.
9. Advising career developments and postgraduate opportunities in local and abroad.
10. Provide wide range of knowledge in use of software packages for the analysis of datas.
11. Encouraging and motivating for group work, mutual cooperation, punctuality, and hard work.
12. Encourage them to develop learning skills and problem solving techniques independently and in groups.

3.2. Learning Outcomes

The department is very clear of the learning outcomes of the students after completion of their degree programme. The department encourages the students to achieve these learning outcomes during the course of study.

On the completion of the degree programme, the students should have:
1. Wider knowledge in science and technology and its applications.
2. Qualified to follow postgraduate studies in the fields of mathematics, statistics, computer science and its related fields.
3. Gained knowledge in self learning, analytical thinking, and learn to get conclusions from data analysis.
4. Qualified the ability of teaching for school students and undergraduates.
5. Built self-confidence for independence, self-motivation for life-long-learning in the field of science and technology.
6. Able to use any software of computer science, statistics and mathematics.
7. Gained knowledge to work in groups and supporting members of the groups.

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

The Department of Mathematical Sciences is one of the three departments of the Faculty of Applied Sciences which was established in 1997. This department has three divisions: namely Division of Applied Statistics, Division of Computer Science and Division of Mathematics.

The first curriculum had been designed in 1998 with the expert advice from the respective departments of the University of Peradeniya. Since then the curriculum has been restructured and revised several times to meet the demand. For examples, Statistics has been renamed as Applied Statistics during 2005/2006. Computer science syllabus was revised during 2006/2007 with the consultation of UCSC staff. A major change has been done during 2007/2008.

According to last revision, Pure Mathematics and Applied Mathematics subjects were again regrouped and renamed as Mathematics I and Mathematics II. Mathematics I consists of fundamental courses from Applied and Pure Mathematics while Mathematics II consists more theoretical courses such as Topology, Complex Analysis, Metric Spaces. The main reason for this change is to make Mathematics I compulsory for all physical science students. Earlier, some of the Physical science students did not follow any mathematics courses. Under this system the students who followed the combination of (a) Chemistry, Computer Science and Physics and (b) Computer Science, Earth Science and Physics in the physical science stream did not have the opportunity to follow Mathematics as a subject.

In the new curriculum revision, the general degree students have the ability to select their three main subjects, one from each basket. The **basket I** consist of Mathematics I and Biology, **basket 2** consists of Applied Statistics, Physics and Chemistry and the **basket 3** consist of Computer Science, Earth Science and Mathematics II. Accordingly, more flexibility is provided for students in selection of main three subjects out of 2x3x3=18 combinations. However, the review team recognized that it is not practically possible to have such a number of combinations due to lack of student intake (40-50 students per year) and lack of staff.
Further, it was noted that in the process of curriculum revision the participation of other stakeholders such as experts from research organizations, government statuary bodies and past students had received a poor consideration.

The Applied Statistics and Computer Science course units are designed to improve the logical and analytical thinking abilities along with data analysis skills which provide the practical exposure. Both subjects have practical component in all the semesters. However, in these two subjects, courses on theory and relevant practical components are offered under different course titles and hence the team felt that the students find it difficult to relate the theory with practice. There is a good blend of course units both in Mathematics I and Mathematics II. However, the review team identified that no practical course units are included for both Mathematics I and Mathematics II.

All of the course units in Computer Scenic and majority of course units (10 out of 17) in Applied Science offered by the Department of Mathematical Science are of 1 credit. This could raise concerns regarding the depth of coverage of the topics. Thus the team feels that Department could offer courses having 2-3 credit units. It was noted that not a single 3 credits course unit for General Degree subjects.

It was found that the examinations are conducted and results are released according to a planned scheduled in spite of the fact that papers are sent for external reviewers.

In relation to the curriculum design, content and review, the judgment of the team is GOOD.

4.2. Teaching, Learning and Assessment Methods.

The main mode of delivery of teaching is through class room lecturing and tutorial classes. All lectures are done in English. The review team observed three teaching sessions and two practical classes. Also the team witnessed good interaction of teachers with students during lectures. Students are encouraged to ask questions. Also students are encouraged to meet their lecturers during office hours to clear doubts.

As the number of students is small, practical classes are also conducted for the entire students. The team noted that at least two instructors were assisting students during the observed two sessions. The computer laboratories provide sufficient number of computers for the students for their computing work, but the number of printers is not sufficient. The network facility was found to be not maintaining well. Some computers are not connected to the network. The support from the network administrator is found to be poor for both students and staff.

Multimedia was not used in all three observed lectures. However, the team noted that the hand writing on the chalk board was clear to all students. The observed lectures were well prepared, delivered well and met the stated learning outcomes.

Handouts are also distributed to the students well in advance as well as just before the lectures. However, it was noted that some notes were hand written.
Students were allowed to borrow books from the main library. The library has a good collection of books yet the students do not appear to be using the library regularly. The main reason is that it is kept open till 4.00 pm during working days. Very limited internet facilities are available to students in the library. The department does not maintain a library of its own.
Tutorial classes are held, but not regularly. The assignments are marked and returned to the students.

Department adopts a variety of assessment methods. The main component of the assessment procedure is the end-semester examination. Each question paper is set and moderated by an internal examiner. The continuous assessment component consisted of a Mid-Semester Examination, which is also generally an open-book examination. Some lecturers give quizzes and computer practical examinations. Marks are given for the attendance as well.

In relation to the teaching, learning and assessment methods the judgment of the team is GOOD.

4.3 Quality of Students including Student Progress and Achievements

The Department of Mathematical Sciences offers courses in Mathematics, Statistics and Computer Science for students both from Physical Sciences and Biological Sciences in the Faculty of Applied Sciences of the South Eastern University of Sri Lanka. However, University Grants Commission (UGC) handles the admission of all students to the University in considering the students' choice and other criteria in the selection process leaving a less-freedom for the department to decide on its intake to different study programs.

The review team noted that almost 45% out of the potential placements in department's academic programs was not filled from UGC list and further just over 50% out of the registered students got through the examinations and received degrees. Therefore, the

Department has a greater opportunity not only for working out promotional activities to attract quality in-take and but also for enhancing quality assurance programs in parallel to academic activities to ensure higher passing out rate.

Maintenance of the students' performances even at subject level with details and also in summarized form has been noted as a strength. However, the review team could not find any evidence on how this information has been used to improve students' achievements and to monitor students' progress during study programs. SER highlights that students attending department's study program have achieved different awards and scholarships. These examples are not only an indication of students' achievements but also show motivation of students to achieving the success. The review team found one of the best practices at the department that could be shared with others is the maintenance of individual Student Record Book (SRB) for computer science practical classes. This SRB could not only be used for student evaluation purposes but also as a mechanism to monitor students' progress.

Besides aforementioned constraints that the department is facing in the prevailing situation, the evidence provided in the SER indicates the higher employability of passing out students mainly in NGO, INGO, private sector and also majority in teaching at government schools. The review team also found a wide spectrum of activities organized by the university mainly through Career Guidance Unit, English Language Teaching Unit, etc to improve the employability of students. However, at the same time, it was noted that due to the lack of coordination between Oluvil Main Campus and Samanthurai Campus students lose several opportunities in taking part in activities organized by the university.

In relation to the quality of students, student progress and achievements the judgment of the team is SATISFACTORY

4.4. Extent and use of Student Feedback

The Department of Mathematical Sciences of the South Eastern University of Sri Lanka has set up a complete formal framework to get students feedback together with detailed objectives. The review team also noted that some evidence of collecting students' feedback for some lecturers and performance of complete analysis on the collected responses are explained in SER.

Further, utilization of supportive staff in the process of collecting students' feedbacks is interesting to note. The department is also to promote Open-door Policy for student-lecturer interactions as highlighted in SER. This is of course a good method to collect students feedbacks informally compared against structured questionnaires especially when closer student-teacher relationships are maintained. However, it was not complete visible how the department reacts on the received students' feedback, how students are informed about actions taken and any follow-up plans. In this context, utilization of a learning management system could minimize the need for manual processing work that otherwise adds to existing department work load.

One of the aspects that the review team identified and needs consideration is the participation from stakeholder-communities other than direct beneficiaries, students. It would have been more advantageous if the involvements of stakeholders like, alumni, potential employers were taken into consideration for the improvement of study programs, course contents and also in determining delivering methods.

The existing student feedback framework is mainly focused only to collect facts about academic programs and their delivery. During the meeting with students and the review team, the team is also informed about several of the relevant issues such as transportation difficulties, differences in rates of cafeteria services at Oluvil Main Campus and Samanthurai Campus, opening hours of other supportive services (library, etc). These issues in the context of supportive services for students to carry out academic program could have been captured through a broader feedback collecting mechanism and also necessary/feasible actions could have taken timely together with university administration.

In relation to the extent and use of student feedback the judgment of the team is GOOD.

4.5. Postgraduate Studies

As indicated in the self-evaluation report, the Department does not offer any Postgraduate study programme. However, collaboration with postgraduate institutes in other universities is seen by the review team. Further, keen interest of the staff members for postgraduate studies is noted. The non-availability of sufficient number of senior staff with postgraduate qualifications has been the main reason for not having a postgraduate programme at the Department. Since the Department does not have special degree programmes covering the three main subject areas, the task of initiating a strong postgraduate programme becomes even more difficult. However, the Department is planning to offer a postgraduate degree programmes (Computational Mathematics) with the collaboration of EUSL.

However, the review team noted that the staff members of the Department have initiated ca number of their own research programmes. Further, the staff of the Department possesses a very good collection of research publications in refereed journals. In view of these facts, review team wishes to recommend initiating a postgraduate programme by research with strong collaboration with an established postgraduate institute.

In relation to the postgraduate studies the judgment of the team is UNSATISFACTORY.

4.6. Peer Observations

According to the self-evaluation report the peer evaluation has not been a practice in the department. However, the review committee noticed from the minutes of the Departmental/Faculty meetings that some discussions on the peer observation have been made yet a formal questionnaire has not been prepared. Evidence was seen by the review team that an informal peer evaluation takes place in the Department. Furthermore, the review committee noted at the discussions with the members of the department that there is positive approach in the department for peer observation. Review committee recommended to initiate a peer evaluation with a structured questionnaire.

In relation to peer observations the judgment of the review team is SATISFACTORY.

4.7. Skills Development

The review team has noted that the Department has provided ample opportunities for the students to improve various skills. These include scientific writing skills, research skills, ability to work in groups, independent learning, computer and other IT skills, presentation

and communication skills, etc.. In addition, the language skills, team work practices and entrepreneurship skills are developed during the study programme. The review team recommends that the required resources to strengthen the above transfer of skills should be made available.

The ELTU staff seems to be overloaded with work and a coordinated English language progarmme is not available. The review team wishes to draw the attention of the university to take actions to stregnthen the ELTU and its programmes.

In relation to the skills development the judgment of the team is GOOD.

4.8. Academic Guidance and Counseling

SDC director, Director/ Career Guidance, Student Counselors make an attempt to offer their services. However, due to the distance between the campus and the main campus in Oluvil, coordination has been a serious constraint. The team noted that sufficient resources have been allocated for the activities by the university authorities. The programmes target both students and the staff and it is seen as a positive move. When new students arrive, they are provided with the support of a mentor. In addition, an orientation programme is conducted during the first few weeks of their entry. Subject coordinators are also appointed to facilitate the coordination.

Whenever students encounter personal problems the students can meet the faculty student counselors or any staff member. However, no staff member has received formal training on counseling. . In addition there is a Chief Student Counselor for the university is at Oluvil. For medical matters, students need to obtain services from the University Health Centre at the main campus.

In relation to academic guidance and counseling the judgment of the team is SATISFACTORY.

Based on the observations made during the visit by the Review Team and as per the facts discussed above the judgments given to those eight aspects under review are as follows:

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

Strength/Good practices

- Revision of the curriculum of Mathematics (Pure & Applied), Applied Statistics and Computer Science time to time in consultation with the experts from the University of Peradeniya and other universities.
- Making Mathematics I as a subject compulsory in all three levels for all Physical Science students.
- Introduction of MMC 1011 (Basic Mathematics I) and MMC 1021 (Basic Mathematics II) as compulsory subjects for Biology Students to bridge the knowledge gap.
- Expansion of Operation Research (AMM 3032) in the old system into two subjects Operational Research I (MTM 2022) and Operational Research II (MTM 2052). Consequently Operational Research I will be compulsory to all Physical Science Students as it is under Mathematics I.
- Offer of a research project of two credits for general degree students as well to be carried out in Level 3/Semester I.
- Conducting special degree at the end of the third year with three semesters in the fourth year in spite of the problems of lack of qualified senior staff.
- Introduction of practical as one credit course for Applied Statistics and Computer Science in each level and each year except Level 3/Semester 2.
- Making MMC 1011 (Basic Mathematics I) and MMC 1021 (Basic Mathematics II) compulsory for Biological Students.
- Introduction of new system to select three subject combination out of 18 combinations. As a result Biology student can choose Applied Statistics and Computer Science as their main subject in addition to Biology.
- Offering a pre intensive course on IT.

Weaknesses

- Maintaining 45 hours of laboratory work for one credit in practical courses, which is higher than standard norm (30 hours) suggested by the UGC.
- Though the Faculty is "Applied Sciences", the subjects offered by the department of Mathematical Science appear to be related to pure sciences.
- The participation from various stake holders other than university experts to circular revisions has not been seen. There are no sufficient documentary evidences to show the curriculum review process.
- No Statistics courses were included in Mathematics I. As a result students who follow some physical science courses will have no chance to learn statistics.
- No separate syllabus for Computer Science for the students in physical and biological science streams.
- The present limits of the number of credits as 84 for general degree and 112 for special degree are lower than the standard requirement of 90 and 120 credits, respectively adopted by other universities in Sri Lanka.
- All courses offered for General Degree under Computer Science in both semesters in each year have only one credit. However, in special degree, almost all courses are 3 credits.

All the courses offered for General Degree under Mathematics I and Mathematics II in both semesters in each year have only two credits. Not a single three credits course is offered in any of the subjects for the General Degree. All of these suggests that course contents and credit limits need to revisited.

- Basic Statistics course has not been made compulsory for some Biology students (eg. Biology, Chemistry and Earth Science) and this leads to problems in the future due to lack of knowledge in statistics.
- Statistics courses are not included for the students who do not select Applied Statistics as a main subject even for Physical Science students. (eg. Mathematics I, Physics and Computer Science).
- Theory and practical are conducted as separate courses and students find it difficult to relate theory in practice.
- Introduction of 18 three subject combinations is practically not feasible as the total number of intake is 40-50 and also sufficient staff is not available if the students ask all combinations.
- Selection of the three subjects (one from each basket) prevents students in selecting good practically oriented courses such as (i) Mathematics I, Earth Science and Computer Science, (ii) Mathematics I, Computer Science and Mathematics II, etc (The review team feels that making Mathematics I compulsory is a good start to applied sciences).
- There are no common IT courses (Orientation courses for IT).
- Students are not informed at the university admission level about the unavailability of the specialization programme.
- Some courses are dropped due to unavailability of lecturers.
- Naming titles of the courses in Applied Statistics (Practical I – V) and in Computer Science (Practical I – V) with a single credit load is not appropriate. The names of the courses do not reflect the content.
- As for Applied Statistics and Computer Science there are no practical modulus for Mathematics I and Mathematics II.
- Some courses in Mathematics I and II are out of sequence.
- Theory and practical components are arranged in separate courses.

Judgment: GOOD

2. Teaching, Learning and Assessment Methods

Strengths/Good Practices

- Teaching and learning environment is highly interactive.
- Teaching materials are distributed during lectures and also sometimes in advance.
- Tutorials sessions are conducted regularly.
- Maintenance of practical record books for each student/each group is also a good practice.
- Administrative head also conducts lectures (Eg. Dean) and gives a good example for others.
- Guest lecturers are organized.
- Moderation of examination papers using external moderators and internal academic staff is a strength.
- Continuous assessment process using record books, practical examination and tutorials is encouraging. The assessment scheme is very clear and students are made of the scheme well in advance.
- Returning of corrected tutorials to the students is also seen.

- Maintaining a good collection of past handouts, tutorials, exam papers by subjects is a strength.
- Even though this is a new university, most of the staff possess postgraduate qualifications.
- Each permanent staff member has a separate room with a computer.

Weaknesses

- No choice of questions for students even when the subject covers two or more credits.
- All computers are not connected to the network and poor network administration.
- Practical questions are not given as a hard copy or a softcopy stored in the server. As a result students have to type the questions before the practical sessions are started wasting their time and resources.
- Students have not been given the options of saving their output from practical in the server and as a result tutor has to copy these one by one.
- Contribution from the program cum system analyst is not encouraging and efficient and comprehensive service to the students needs to be arranged.
- In some lectures, hand written notes are given to the students.
- No Learning Management System is in operation.
- No qualified senior staff especially for Computer Science is available.
- Inconsistent special degree programme is a weakness.
- No computing facilities are provided for the temporary staff.
- No sufficient supporting staff (only one typist and temporary labourer) is available.
- There are no career prospects even for existing supporting staff.
- Though there is sufficient number of computers most of the machines are not usable.
- Lack of printing facilities to the students is a common problem.
- No certificate is given for the students by the ELTU for the competency in English..
- Closure of library at 4.00 pm prevents students using the library.

Judgment: GOOD

3. Quality of Students, including Student Progress and Achievement

Strengths/Good Practices

- Maintenance of records of students' performance subject wise.
- Maintenance of individual Students' Record Book for practical classes in computing.
- Higher employability of passing out students mainly in NGO, INGO, private sector.
- Students have won a number of different awards.
- Wide spectrum of student's quality enhancing activities organized by the university mainly through Career Guidance Unit and English Language Teaching Unit.

Weaknesses

- No evidence of how students' performance information has been used in improving academic programs
- Difficulties in the coordination process of student's quality enhancing activities organized by the Career Guidance Unit, English Language Teaching Unit between Oluvil main Campus and Samanthurai Campus.
- Constraints in access time at Samanthurai campus for academic as well as welfare services

- Transportation difficulties and time constraints in transportations that university has arranged for students in Samanthurai.

Judgment: SATISFACTORY

4. Extent and Use of Student Feedback

Strengths/Good Practices
- Response to student feedback is communicated to students.
- Student feedback are discussed at the Faculty Board and the actions taken are displayed in the Notice Boards.
- Formal questionnaire has been introduced this year for student feedback.

Weaknesses
- The student feedback questionnaire is not very comprehensive.

Judgment: GOOD

5. Postgraduate Studies

Strengths/Good Practices
- Realizing the constraints in qualified staff, postgraduate programmes have not been initiated. But collaboration with postgraduate institutes in other universities is seen.
- Keen interest of the staff members for postgraduate studies.
- The Department is planning to offer postgraduate degree programmes (Computational Mathematics) with the collaboration of EUSL.
- A joint M.Sc. programme has been started and the first batch has completed the course.
- Some lecturers have published their research in reputed journals showing their interest on research activities

Weaknesses
- No plans are developed to offer a comprehensive postgraduate programme even in the near future.

Judgment: UNSATISFACTORY

6. Peer Observation

Strengths/Good Practices
- Peer observation has been initiated and an evaluation form has been prepared.
- Staff is interested to embark on this peer evaluation process.

Weaknesses
- Strengthening the peer observation process and making it a formal event is required.

Judgment: SATISFACTORY

7. Skills Development

Strengths/Good Practices

- Practical handouts show evidence of practical skill development.
- Writing skills are developed through practical reports.
- Research methodology course has been introduced recently and made compulsory for all the students.
- Attending workshops and training for academic and non academic staff is very encouraging.
- The students have produced a CD for AL students who do not have laboratory facilities – CD was available for inspection and review.
- Computer Society organizes workshops and seminars and encourages students to participate.
- English is taught in the first year as a one credit course.

Weaknesses

- Computer laboratories are not very well organized to offer practical classes.
- Some of the computers have not been kept ready for the practical making the students to share the machines.
- Individual workspace has not been provided to the students.
- Practical class orientation and table arrangement make it difficult for the instructors to reach the students.
- More input should be provided by the system analyst to conduct the practical classes
- Not sufficient staff in ELTU
- Lack of formal coordination between ELTU and the academic staff
- No language laboratory and facilities for the students at the ELTU.
- No provisional certificate is given to the students after following the English course.
- No English courses for the third year students.

Judgment: GOOD

8. Academic Guidance and Counseling

Strengths/Good Practices

- SDC director, Director/ Career Guidance, Student Counselors provide good service to students.
- Sufficient resources have been allocated for the activities.
- Activities are conducted targeting students and the staff.
- Appointment of a Mentor at the beginning for all students.
- Subject coordinators are appointed.

Weaknesses

- Most of the programmes target the three faculties in Oluvil.
- No formal training for student counselors

Judgment: SATISFACTORY

6. RECOMMENDATIONS

Based on the findings of the review, the review team wishes that the Department may consider the following recommendation in order to improve the quality of the study programmes further.

1. Department of Mathematical Science can be considered as the backbone of the Faculty of Applied Sciences or the proposed Faculty of Technology. It is generally accepted that without mathematical background of students, Applied Sciences or Technology can not be developed. Thus Department of Mathematics could play a major role to both the Faculties.
2. For the future students and staff of the Faculty of Applied Sciences and the proposed Faculty of Technology could be amalgamated and more combinations of practical orientated subjects could then be offered.
3. A Basic Statistics Module and Statistical Data Analysis Module are recommended to be included for all students who do not follow Applied Statistics as a subject, irrespective of Physical or Biological students. .
4. The subjects offered in computer science need to have variety of credit levels in the courses. It may not necessarily be one credit for all subjects throughout the entire three year duration.
5. Introduction of practically feasible subject combinations based on resources, the number of students intake, etc. is recommended in place of offering a large number of combinations to select for the students.
6. The number of credits requirements for General and Special Degree is recommended to be increased in par with the norms adopted by other universities in Sri Lanka.
7. The duration for a one credit for practical is recommended to be reduced from 45 hours to 30 hours.
8. Consider replacing Statistical Practical I – V (45 x 5 = 225 hours) with Statistical Data Analysis I (level II), and Statistical Data Analysis II (level III), having two credits each so that duration can also be reduced from 225 hours to 60 x 2=120 hours. The balance duration can be used to increase the number of credits from one to two.
9. Consider introducing Matlab or Mathematica software for practical under Mathematics I and Mathematics II. These software are used in many universities as teaching tool for demonstrate Numerical Analysis, Calculus, etc. can be demonstrated using those software.
10. Consider improving Computer facilities (Number of computers, quality of machines and networking)
11. Consider allocating at least one more printer to each computer laboratory.
12. Developing a mechanism to connect all computers to the server.
13. It is recommended that students be allocated some storage space in the server.
14. The attitudes of the program cum system analyst staff needs to be improved for the department to offer a better computing environment.
15. Unlike other universities as there are no private printing, photocopy, internet facilities around the university, some system could be implemented to have such facilities to the students even at a cost.
16. Recommend to allocate a permanent labourer to the department
17. Students should be given more opportunity to take part in English language teaching, career governance, and counseling activities organized at main campus at Oluvil.
18. Recommend finding a feasible solution to the limited time availability for academic and nonacademic services available at Samanthurai campus. Due to transportation

difficulties arrangement of students' accommodation close-by or transportation facility even late hours can be suggested.

19. Suggest organizing more inter university students' academic programs to interact with students following similar courses and share the knowledge while get strengthening relationships.
20. The department can introduce more promotional activities such as open-days to attract high caliber students and also to accommodate full number to academic programs at the department
21. It is also good to maintain the balance between qualified academic staff (with Ph.D. and M.Phil.) in all three respective divisions within the department by attracting qualified staff and giving opportunity to junior staff.
22. Learning Management System could also be used to collect and process students' feedback.
23. In addition to existing feedback mechanism to collect information about academic programs, department may consider introducing a feedback system to get students responses about the quality of academic supportive and extra-curricular services provided by the university.
24. University's service offering centers such as Library, English Language Teaching Unit, Career Guidance Unit, Students Counseling Center, etc can also be improved with students' feedback customizing their services according to students needs.
25. Suggest developing a postgraduate programme by research with a strong collaboration from a well established postgraduate institute.
26. Recommend introducing a formal, comprehensive peer observation procedure with the participation of all academic staff members.
27. Suggest taking necessary steps to improve the computer network and networking environment.
28. Recommend giving more attention to the ELTU and the programmes conducted by ELTU
29. Academic advisors or personal tutors need to be appointed by the department in addition to the mentors.
30. A post of Senior Student Counselor can be created to the Sammanturai Campus.

7. ANNEXES

Annex 1. AGENDA FOR THE REVIEW VISIT

Day 1 - 16th February 2009 (Monday)

08.30 - 09.00 am	Arrival of Team and Brief Discussion of the Review Team
09.00 – 09.30 am	Meeting with the Dean/ Applied Sciences, Head of the Department and Members of the Internal QA
09.30 – 10.00 am	Discuss the Agenda with Head/ Mathematical Sciences
10.00 - 10.30 am	Meeting with Head/Mathematics and Academic Staff at the Department and *Tea with academic staff of the Department*
10.30 – 12.30 pm	Department Presentation on the Self Evaluation Report
12.30 – 13.30 pm	*Lunch with academic staff of the Department*
13.30 – 14.30 pm	Observing Department facilities (Computer Laboratories, Classrooms)
14.30 – 15.00 pm	Observation of Teaching (1st year Applied Statistics)
15.00 – 15.30 pm	*Meeting with Staff of Department of Mathematical Sciences with Tea*
15.30 – 17.30 pm	Observing Documents

Day 2 - 17th February 2009 (Tuesday)

09.00 – 10.00 am	Meeting with Director/ SDC, Director Career Guidance, Student Counselors, Temporary Tutors and Temporary Demonstrators
09.30 – 10.00 am	Visit to ELTU and Library.
10.00 - 10.30 am	Observing Teaching – Third Year (Applied Statistics)
10.30 – 12.30 pm	Observing Documents
12.30 – 13.30 pm	*Lunch*
13.30 – 14.00 pm	Observing Teaching – Practical - Third Year (Computer Science)
14.00 – 15.30 pm	Observing Documents with Tea
15.30 – 17.30 pm	Observation of Other facilities (Staff Quarters, Student Hostel)

Day 3 – 18th February 2009 (Wednesday)

09.00 – 09.30 am	Observing Teaching – First Year Lecture (Computer Science)
09.30 – 10.30 am	Meeting with undergraduate students
10.30 - 11.30 am	Reviewers Discussion with Tea
11.30 – 12.30 pm	Meeting with Head and Staff of the Department for reporting
12.30 – 13.30 pm	*Lunch*
13.30 – 17.30 pm	Report Writing

Annex 2. LIST OF MEMBERS PARTICIPATED FOR EACH MEETING ALONG WITH THE FOUR MEMBERS OF THE EVALUATION COMMITTEE

During the visit, the Review Team held discussions with the followings officers/students.

Day 1 – 16/02/2009

1st Meeting with Vice Chancellor

Name	Position
Mr. A M. Razmy	Dean, Faculty of Applied Science
Dr. P. Elango	Head, Dept. of Mathematical Science
Prof. Collin N Peiris	Quality Assurance Specialist
Dr. A. G. Husain Ismail	Vice Chancellor

2nd Meeting with Academic Staff

Name	Position (Field)
Dr. P. Elango	Head of the Department, Senior Lecturer Gr. II (Mathematics)
Mr. A. Jahufer	Senior Lecturer - Gr. II (Statistics) Subject Coordinator – Statistics
Mr. H. M. M. Naleer	Senior Lecturer - Gr. II Subject Coordinator - Computer Science
Dr. K. Komathiraj	Senior Lecturer- Gr. II (Mathematics)
Mr. M. A. A. M. Faham	Lecturer (Prob.) (Mathematics)
Mr. M. Abdul Raheem	Educational Assistant/Mathematics
Mr. A. L. Hanees	Lecturer (Prob.) / Computer Science
Mr. I. M. Kalith	Instructor in Computer Technology
Mrs. Fahmiya Noordeen	Lecturer (Prob.) /Mathematics
Mrs. Yogeswary Raviraj	Educational Assistant /Mathematics
Mr. M. A. C. M. Raafi	Instructor in Computer Technology

3rd Meeting with Support Staff

Name	Position
Mrs. Katheeja Ameer Ali	Typist
Mr. K. Raisudeen	Lab Attendant

Day 2 – 17/02/2009

4th Meeting with Temporary Staff (Academic)

Name	Position
Mr. S. H. Nizath	Tutor (Mathematics)
Miss. M. M. Zathiha	Tutor (Mathematics)
Miss. M. Y. Thasneem	Demonstrator (Computer Science)
Miss. A. M. Farsana	Demonstrator (Computer Science)
Mr. A. Rafeek	Tutor (Applied Statistics)
Mr. M. M. Aboobucker	Tutor (Applied Statistics

5th Meeting with ELTU Staff

Name	Position
Mr. M. M. Abdul Rahuman	Instructor in English

6th Meeting with Library Staff

Name	Position
Mrs. M. M. Mashroofa	Assistant Librarian

7th Meeting with Staff at Oluvil

Name	Position
Dr. A. Jabfer	Director, Staff Development Centre
Mr. M. B. M. Amjath	Senior Student Councellor
Mr. A. L. Hanees	Students Councellor
Mr. A. Jamaldeen	Director, Career Guidance Unit

Day 3 – 18/02/2009

8th Meeting with Undergraduates

Seventy five (75) students attended to the meeting which last long about 1.5 hours. The majority of students are from Bio Science students irrespective of the level. The distribution of 75 students by levels x streams is shown below.

Table: Distribution of students

Level	Stream		Total
	Physical science	Bio Science	
1	15 (37.5%)	25 (62.5%)	**40**
2	9 (47.4%)	10 (52.6%)	**19**
3	6 (37.5%)	10 (62.5%)	**16**
Total	**30**	**45**	**75**

Parenthesis represents the raw percentages.

9th Meeting with Head & Staff for Reporting

Name	Position
Mr. A. M. Razmy	Dean, Faculty of Applied Science
Dr. P. Elango	Head, Dept. of Mathematical Science
Mr. M. A. C. M. Raafi	Instructor in Computer Technology
Mrs. Fahmiya Noordeen	Lecturer (Prob.) /Mathematics
Mrs. Yogeswary Raviraj	Educational Assistant /Mathematics
Mr. I. M. Kalith	Instructor in Computer Technology
Mr. M. Abdul Raheem	Educational Assistant/Mathematics
Mr. M. A. A. M. Faham	Lecturer (Prob.) (Mathematics)
Dr. K. Komathiraj	Senior Lecturer (Mathematics)
Mr. A. Jahufer	Senior Lecturer (Statistics)

Annex 3. DOCUMENTS OBSERVED

1. **Curriculum Design, Content and Review**
   Faculty Handbooks – 2002, 2005, 2007, 2007/2008
   Detailed Course Outline (Syllabus)
   Senate document
2. **Teaching, Learning and Assessment Methods**
   Handouts
   Tutorials
   Lecture notes (Mainly hand written)
   Student practical record books
   Project reports
   Model answers and marking schemes
   Student performances at the examinations
3. **Quality of Students including Student Progress and Achievements**
   Students' Z Scores
   Students' GPA records (No evaluation has carried out to review the progress of students with time based on their GPA)
4. **Extent and Use of Student Feedback (Qualitatively and Quantitatively)**
   Student feedback forms
5. **Postgraduate Studies**
   No postgraduate studies conducted by the Department
6. **Peer Observations**
   One peer observation document is available
7. **Skills Development**
   Practical handouts to show evidence of practical skill development
   Writing skills – Practical reports
   Research methodology course has been introduced recently – compulsory for all the students
   Attending workshops, training for academic and non academic staff Entrepreneurship workshop at British Council – 3 students have participated
   The students have produced a CD for the AL students who do not have laboratory facilities – CD was available
   Computer Society – organize workshops and seminars, encourage students to participate in the above)
8. **Academic Guidance and Counseling**
   Appointment of student counselors

General Documents

Student details including their Z scores
CVs of academic, non academic and visiting staff
Documents to show allocation of lectures
List of examiners of all subjects
Requirements of visiting lecturers, appointment letters
Department, Faculty board and Senate minutes
Research publications of some academic staff members