SUBJECT REVIEW REPORT

DEPARTMENT OF MATHEMATICS

FACULTY OF SCIENCE

EASTERN UNIVERSITY OF SL

19th to 21st January 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 in universities 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 as well. 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

1. Dr. Prasad M. Jayaweera (Senior Lecturer, Department of Computer Science, University of Ruhuna)
2. Dr. T.S.G. Peiris (Senior Lecturer, Department of Mathematics, University of Moratuwa)
3. Dr. (Ms.) N.D.K. Dayawansa (Senior Lecturer, Department of Agricultural Engineering, University of Peradeniya)
4. 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 the Self Evaluation Report prepared by the Department to the review team in advance. The review team having studied the Self Evaluation Report carried out the review process on 19th, 20th and 21st of January, 2009.

On 18th morning, the review team met the Vice-Chancellor together with the Dean/ Faculty of Science and Head/ Department of Mathematics. The Head of the Department of Education and Childcare was also present at the meeting. The Vice-Chancellor at this meeting briefed the reviewers on the present situation at the University.

The review team together with the Head/ Mathematics had a brief meeting at the Head of Department's office to finalize the agenda for the review process. 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 the Faculty Board Room. At this meeting, the Head of the Department made a detailed presentation 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 Faculty, Student Counselors, Directors of CICT and Staff Development Centre, Coordinators of Career Guidance Centre & ELTU, the present undergraduate students following the B.Sc. General Degree Programme, Special Degree Programme in Mathematics and the External degree students. 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, parallel computing laboratory and other common computer facilities in CICT and in the old building block, library, Medical centre, new building complex, etc.

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

2. BRIEF HISTORY OF THE UNIVERSITY AND THE DEPARTMENT

The Eastern University, Sri Lanka (EUSL) is situated along the Colombo-Batticaloa A11 highway, 300 km from Colombo and 17 km from Batticaloa. The location is considered as peaceful and thinly populated area with easy access to the south through the Chenkalady-Badulla and Batticaloa-Colombo roads. EUSL has been the first higher educational institution established for the Eastern province and the 9th University of Sri Lanka. The main University at Vantharumoolai comprised of a land area of 119 acres which is separated by the Colombo main road into the old complex - 33 acres and the new complex - 86 acres.

The EUSL was established, initially as the Batticaloa University College (BUC), in October 1981 and had been affiliated to the University of Peradeniya. At the beginning BUC, functioned with two Faculties, namely, Science and Agriculture. In 1986, the BUC had been upgraded as a full-fledged university, as a result, learning opportunities were expanded by the addition of two Faculties of Commerce and Management and Arts and Culture. The inclusion

of Swami Vipulananda Institute of Aesthetic Studies and the establishment of the new Faculty of Healthcare Sciences broadened the scope of study programmes offered by the EUSL. The affiliated College at Trincomalee which was upgraded and became the Trincomalee Campus of EUSL with the Faculty of Communication and Business Studies and the Faculty of Applied Sciences. The main Campus at Vantharumoolai has service centers that include the English Language Teaching Unit (ELTU), Centre for Information and Communication Technology (CICT), Staff Development Centre (SDC) and Career Guidance Unit (CGU).

The steady growth of the EUSL has been impeded by a series of political disturbances that prevail over in the country for more than two decades. In spite of the disturbances and drawbacks, the EUSL has continued with its academic programmes. The Physical Science stream of the Faculty of Science comprises of Mathematics, Physics and Chemistry Departments which have limited infrastructure facilities at the old complex site. A new Science block with modern amenities is under construction in the new complex site (SER, 2008).

Vision of the Faculty

"Faculty of Science, Eastern University, Sri Lanka aims to be a national centre of excellence for higher learning and research with a competitive advantage, responsive to the dynamics of the regional, national and global conditions."
(Faculty of Science, Eastern University, Sri Lanka, Corporate Plan Vision Statement 2007)

Mission of the Faculty

"Faculty of Science, Eastern University, Sri Lanka is to pursue excellence in teaching, training and research in science and science based technology, to offer wide range of opportunities for education and training to enhance the socio-economic state of the region and the people by encouraging application of learning and research and to secure and administer resources to achieve these aims effectively."
(Faculty of Science, Eastern University, Sri Lanka, Corporate Plan Mission statement 2007)

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.

Overview Provision- Department of Mathematics

The Department of Mathematics aims to provide:

- degree programmes that offer high quality learning experience in an environment of internationally recognized research, keeping in line with the University policy, so as to expose students to recent advances in knowledge and techniques;
- a range of challenging learning opportunities within the modular teaching structure of the University to enable students to develop their academic interests and potential;
- encouragement to students to develop a knowledge base, intellectual abilities and transferable skills that will enable them to contribute effectively to research in the areas of Pure Mathematics, Applied Mathematics, Computer Science and Statistics and other careers and to be better positioned to meet the needs of potential employers.

- opportunities for students to develop the skills and foster the interest required for lifelong learning;
- a friendly, responsive and supportive departmental environment that is conducive to enthusiastic learning, high standards and good completion rates;
- support for our academic staff in their career development, including the provision of feedback and peer advice.

3. AIMS AND LEARNING OUTCOMES

3.1. Aims

1. to provide students with knowledge and understanding of the fundamental theory and also their modern development, applications and techniques in the areas of Pure Mathematics, Applied Mathematics, Computer Science and Statistics.
2. to develop the intellectual skills such as the understanding of the basic fundamental concepts, creativity, independent thinking, reasoning and analysis and of producing results and to solve real world problems.
3. to enable the students to effectively apply the knowledge, personal and transferable skills in a wide variety of areas such as research, industry, academia and management.
4. to provide strong knowledge base for promising graduates to pursue further studies in areas of academic interests.
5. to produce graduates who will enhance the public welfare and bring social and economic development to the people and country.
6. to transfer technologies to the rural areas of the region.

3.2. Learning Outcomes

On successful completion of the courses of study in Pure Mathematics, Applied Mathematics, Computer Science and Statistics, students in the Faculty of Science should have:

1. gained knowledge and understanding of areas of Pure Mathematics, Applied Mathematics, Computer Science and Statistics, based on programmes providing the initial broad frame works followed by successively increasing depth of study.
2. learnt how this knowledge and understanding can be utilized for research.
3. developed a range of personal and transferable skills, viz., critical ability, independence of thinking, problem solving, computer literacy, designs of algorithms and programming languages, database design and management, information management, oral and written communication, team work and had experience of applying them to varied situations.
4. learnt technical and intellectual skills necessary for obtaining, analysis and interpretation of data set and had direct experience of research based on the project work.
5. developed their ability for critical, self-motivated learning.
6. In addition to and specifically for all Pure Mathematics, Applied Mathematics, Computer Science and Statistics students should have:
7. obtained knowledge and understanding in the fundamental theory, its applications and techniques in selected areas of Pure Mathematics, Applied Mathematics, Computer Science and Statistics.
8. understood the abstract concepts, their utilities and further developments.

9. developed skills such as logical and analytical thinking, problem solving, algorithms designing and using programming languages, designing of databases and management and data analysis for useful results.
10. In addition to, for all the Pure Mathematic students should have:
11. gained a sound fundamental knowledge and understanding in the following areas of Pure Mathematics: abstract algebra and linear algebra, set theory, geometry, real and complex analysis, number theory and topology.
12. developed the skills of application of the concepts arising from these subjects to other areas of field of study, specially, Applied Mathematics, Computer Science and Statistics.
13. In addition to, for all the Applied Mathematics students should have:
14. learnt a range of mathematical methods and their utilities, specifically in Physical Science, and their applications in other areas as well.
15. gained sound knowledge and understanding in differential equations, matrices and classical mechanics, for example, rotating bodies, Hamiltonian system, Poisson brackets, oscillatory and particle systems and compressible and incompressible fluids and rotating fluid bodies in fluid dynamics.
16. developed the abilities of using computer package to solve computational mathematical problems.
17. In addition to, for all the Computer Science students should have:
18. gained sound knowledge and understanding in areas of Computer Science such as designing algorithms and programming languages, organization and architecture, operating systems, data structures, database designs, software engineering, graphics, artificial intelligence email and internet and computer network.
19. learnt skills such as designing algorithms and implementing programming languages database management and email and internet applications and computer networking.
20. developed the abilities to creatively solve real world problems.
21. In addition to, for all the Statistic students should have:
22. gained sound knowledge and understanding of the basic theoretical aspects of Statistics such as probability distributions.
23. learnt skills in Applied Statistics which are fundamentals to the design of experiments, sampling and data analysis and time series analysis and inference.
24. developed the abilities in analysing statistical and mathematical problems arising in the public, private, industrial, health and financial sectors etc., using statistical packages to obtain information.
25. In addition to, for all Mathematics Special students should have:
26. gained knowledge and understanding in the advanced abstract concepts and modern development of selected areas of Pure and Applied Mathematics.
27. developed a broad knowledge base for advanced studies and research.
28. learnt the skills to produce possible mathematical ideas and results using this knowledge and understanding, by way of independent research project work.

Programme Details:

In the light of a major restructuring of the degree programme by the Faculty of Science in 2000, there had been an initial change of curriculum from term system to semester system. Presently, the first, second and third year Physical Science students follow the modularized curriculum designed in 2000. Further revision of the curriculum has been done by a subject review committee of the Faculty Board during 2003/2004. New revision of the curriculum has been done as recently as in 2008 and implemented from the first year of 2007/2008 batch of Physical Science students. The curriculum reflects the sufficient academic standard set in the degree programmes in delivering the intended student learning outcomes identified in the

Self Evaluation Report. The course units that are offered at different levels enable the students to develop their subject knowledge and understanding, personal and technical skills.

Presently the Faculty of Science offers General Degree in Physical Science of three year duration and B.Sc. Special Degree in Mathematics of four year duration.

Each course unit has a credit value with each 15 hours of lectures and 30 hours of laboratory work are equivalent to one credit. For the General and Special Degrees, each student has to complete 90 and 120 credit course units, respectively (SER, 2008).

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

The Department has made attempts to revise the curriculum regularly. Further, the Department together with the Faculty has adopted the semester based course unit system in 2000. The curriculum has last been reviewed in 2008 and has been made effective for the present first year of the Mathematics, Computer Science and Statistics students (2007/2008). In addition to the subject specific courses, a choice has been made available for the students to follow other interested courses and obtain credit. The credit limit is maintained at 90 and at 120 for general and special degree programmes, respectively. This is in line with the existing norm. The specialization programme is available for mathematics only. The proposal for computer science special degree program is very much appreciated by the students as well. The provision for certificate and diploma for proficiency after the first and second years respectively is a very good practice which is not commonly observed in other universities. The external degree program is an achievement of the faculty that is strongly supported by the department.

However, the process of curriculum revision has received limited consultation and participation of main stakeholders. The participation of stakeholders outside the university especially, alumni of the Faculty has received very poor consideration. In the curriculum, theory and relevant practical components are offered under different course titles and hence the students find it difficult to relate the theory with practice. Some of the course numbers are confusing and need improvements in line with the current standard course/ subject coding adopted by the university system in Sri Lanka. Some of the course titles/ names do not reflect the content. Some of the course titles are generic and it is difficult to get an understanding from the course title about the subject covered in the course. The course list of the statistics curriculum does not reflect any practical courses. Further, deviation from the standard norms in allocating hours for theory and practical classes are also found.

It was found that the external degree program is generally extended for several years, examinations are conducted and results are released late. Currently, there are no lending facilities for external students and they are in need of borrowing books from the library for their studies. Noteworthy practice adopted by the Faculty of Science of EUSL is the provision of access to the faculty laboratories even for external students.

In relation to the curriculum design, content and review, the judgment of the team is "SATISFACTORY"

4.2. Teaching, Learning and Assessment Methods.

Teaching and learning methods

Teaching and learning methods are aimed at equipping the students with necessary subject knowledge and skills. The review team noted that a variety of teaching and learning strategies are used. These include lectures, practical classes, tutorial, laboratory sessions, self-learning, group work and project work.

The library has a good collection of books yet the students do not appear to be using the library regularly. The library is kept open for extended hours during the examination period but found to be closed by 5.00 p.m. during normal working days.

The computer laboratories provide sufficient facilities for the students for their computing work. These laboratories were found to be maintaining well. The students are given unlimited access to these facilities in their teaching/learning processes. The laboratory sessions conducted even for non-computer science students are found to be satisfactory. These practical classes are designed to acquire a range of subject specific skills including programming, software development, statistical analysis, etc. The students' work observed by the review team indicates that the students acquire necessary subject specific skills and other useful skills. This was clearly evident during the student group presentation made for the review team where the students displayed their talents, skills and capabilities in sharing a task and achieving it successfully.

The facilities available at the old building complex are rather limited and the overall space allocated for the department is not sufficient. However, the review team noted that new Science block, CICT new building and some other proposed buildings would provide the necessary space for class rooms and laboratories in the near future. The strong collaboration between the department and the CICT makes the teaching programme very strong. Although some administrative decisions are to be made for the housing and joint management of computer units of the Department with CICT, informal arrangements are in place to conduct a strong academic programme. In addition, the review team appreciated the use of intra-net for teaching, which is a good practice that can be shared by other universities.

The workload of teachers is too high because one department does the work done by three separate departments (mathematics, computer science and statistics) in other universities with a limited number of teachers. In spite of heavy work load, availability of the lecturer responsible for the course at practical classes together with instructors is a good sign. The approximate 10 to 1 ratio for the student to instructor shows the commitment of the staff. The review team noted that limited postgraduate qualified staff is available in the Department and inadequate academic cadre positions to appoint more staff members. The cadre positions for supporting teaching staff are also very limited. Therefore, the senior teachers do not have much time for their research work and postgraduate student supervision.

The review team observed that there is a urgent need for further improvements of delivery modes of lectures (provision of complete references, avoid dictating notes, use of multi-media, time saving measures such and printed tutorials, etc.).

Lecture room facilities are not up to an acceptable standard (only OHP, poor seating, low quality furniture, poor ventilation). Distribution of handouts and other teaching materials are found to be very limited although some members provide printed lecture notes well in

advance. The learning outcomes of each course unit are not properly communicated to the students. It was also found that the use of teaching aids is very much limited. Transport facilities available for the exposure visits and field visits are very primitive.

Assessment strategies

The Assessment strategies are found to be both formative and summative. These have been designed to assess the knowledge and skills of the students. The students are aware of the methods of assessment at the beginning of the course unit. The variety of assessment methods such as continuous assessments and mid semester examinations is used by the Department to assess the students. In addition, assignments, tutorials, quizzes and presentation skills are also assessed. It was also noted by the review team as a good practice that even the general degree examinations papers are sent for external correction. All question papers are moderated/ scrutinized and second marking is done for the specialization students by overseas examiners. Answer scripts are marked by two examiners for the General Degree. Certain percentage of the continuous assessments and other assessments contribute to the final mark. These amounts can vary depending on the nature of the subject.

In relation to the teaching, learning and assessment methods the judgment of the team is "SATISFACTORY"

4.3 Quality of Students including Student Progress and Achievements

University Grants Commission handles the admission of all students to the University in considering the students' choice and other criteria in the selection process. Therefore, the university, Faculty and the Department have no much of a choice in selecting students for different study programs.

It was found that only around 50% of the vacancies are filled for degree programmes. However, strict adaptation of 80% students' attendance for lectures is a good practice. It is also noted as a good practice that an aptitude test is conducted for selecting students to follow computer science. This also allows department to control the intake for computer science study programme. However, the team did not find evidence that students' progresses are being monitored continuously by the department.

It was found that the passing rate of the students in mathematics courses is good. The students also show good team work skills. However, the team could not find a proper focus of the study programmes for employability in diverse sectors.

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

4.4. Extent and use of Student Feedback

The Department obtains qualitative student feedback about the academic programme and the requirement of infrastructural facilities at various forums such as Faculty Board meeting, practical session and lecture & tutorial classes. This is possible as the student number of a batch is less than 50. It was conveyed that every lecturer obtains feedback from at least one of his/her classes. Students expressed happiness about their interaction with teachers and higher authorities. However, it is noted that although structured questionnaire is adopted for feedback, the process has not been formalized. No records were found from the lecturers who

have taken a summary of feedbacks that he/she gets with a list of follow-up actions. Some students are getting very high credit load from a single lecturer. Although collecting students feedbacks have started from Jan 2009, interpretation, summarization and how important feedbacks are adopted in study programmes are not found in the documentation provided for the review team.

In relation to the extent and use of student feedback the judgment of the team is "SATISFACTORY"

4.5. Postgraduate Studies

As indicated in the self-evaluation report, the Department does not offer any Postgraduate study programme. However, it is noted that a proper postgraduate framework has been developed by the faculty. 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 offers only a single special degree programmes, the task of initiating a strong postgraduate programme becomes even more difficult. However, the review team appreciates the efforts of the Department to start two post graduate degree programs namely M Sc in Science Education and M Sc in Computation and Applied Mathematics.

However, the review team noted that academic staff of department is involved in postgraduate supervision at other universities/institutes. Further, some of the staff of the Department possesses good collection of research publications in refereed journals both locally and internationally. In view of these facts, the review team wishes to recommend initiating a proposed postgraduate programme with strong collaboration with an established postgraduate institute.

In relation to the postgraduate studies the judgment of the team is "UNSATISFACTOR"

4.6. Peer Observations

According to the self-evaluation report the peer evaluation has not been a formal practice in the department. However, the review committee noticed that the Department is making use of a questionnaire on peer observation which has been formulated with the suggestions from the staff members who have completed certificate course in teaching methodology conducted by the Staff Development Centre (SDC) of Universities of Colombo, Peradeniya and Kelaniya. The team found evidences to believe that this practice has been adopted in 2008. Further, the review committee noticed at the discussions with the members of the department that there is positive approach in the department for peer observation. Review committee recommended going ahead with a formal procedure in considering this process as a mutual help for colleagues rather than it to be considered as a fault finding mission of members of the department by the senior staff.

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

4.7. Skills Development

There were evidences that the Department has provided opportunities for the students to improve the skills. These include ability to work in groups, creative thinking, independent

learning, scientific writing, computer skills, presentation, communication and language skills. Further, the essential qualities such as leadership, punctuality, commitment and integrity are developed during the study programme. The review team recommends that the resources required to facilitate the above should be secured and continued.

The contribution of the ELTU is very noteworthy. ELTU is equipped with a number of language learning facilities including multi-media and other resources. Even though dedicated and resourceful staff is available at ELTU, the number is not sufficient to cater for the entire student community. The students are not grouped based on the level of competence at the beginning of the course avoiding discrimination among students based on English language skills and it has been noted a good practice by the review team. There are general assessments during the English language training to get the feedback of the students and the ELTU staff customizes the course on the fly. New teaching methods based on the students background and the discipline of study are adopted by ELTU. ELTU also supports students during the preparation of project reports and the coordination of ELTU with the academic activities and the staff is very promising. However, ELTU has got limited allocations for hiring resources persons from outside (British Council, etc). It is also noted that the ELTU staff is motivated to obtain higher academic qualifications even though the resources for staff development at ELTU are limited. ELTU also assists in publishing a Newsletter, establishing and running the English club, organizing study tours. ELTU also conducts separate training for presentation skills.

In addition to language skills, the overall skill development efforts under resource constraint environment are appreciated by the review team.

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

4.8. Academic Guidance and Counseling

When new students are enrolled, faculty handbooks are made available for them to obtain necessary information. The handbook provides information about University, Faculty, Departments, subjects offered, subject combinations, academic programmes and details of course titles. An orientation programme is conducted during the first few week of their entry. At the orientation programme, students are given the opportunity of meeting the Vice-Chancellor, Dean of the Faculty, Heads of Department, Career Guidance Officer and Senior Student Counselors. At this programme an introduction is given to the students on various departments in the faculty, the courses offered by the department, and the selection criteria to offer the subject concerned for the general degree programmes and special degree programme in Mathematics.

The counseling service has linked with the professional counseling service in Batticaloa. This is a good practice since the university has no professionally qualified counselors. Whenever students encounter personal problems it has been found that the students can meet the faculty student counselors or any staff member. For health related problems students can approach University Health Centre where there is a doctor who is regularly available.

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

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	SATISFACTORY
Teaching, Learning and Assessment Methods	SATISFACTORY
Quality of Students including Student Progress and Achievements	GOOD
Extent and Use of Student Feedback	SATISFACTORY
Postgraduate Studies	UNSATISFACTORY
Peer Observation	SATISFACTORY
Skills Development	GOOD
Academic Guidance and Counseling	GOOD

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

- For general and special degrees in computer science, complete and standard curricula covering all major areas have been developed.
- Inclusion of 1/3 marks from continuous assessments for the final grade is a positive development.
- A 15 week project work designed for CS students is found to be very useful for the students.
- Introduction of Mathematical software like “Mathematica” for the first year students (MT 151 – 1 Credit course) is found to be a good initiative.
- The Department serves students belonging to all other disciplines by conducting Mathematics courses.
- Even with a limited staff, offering a special degree in Mathematics is a positive development.
- The Department has a strong team for teaching Pure Mathematics.

Weaknesses

- No evidence of proper/regular revisions of curriculum with stakeholder participation.
- Offering theory and relevant practical separately in separate courses makes it difficult for students to link the theory with practice.
- Titles of some subjects do not reflect the actual course content (Eg: MT 308 - Statistics)
- Use of the same subject name at two different levels is confusing (Eg: MT 217 - Mathematical Modeling and MT 409 Mathematical Modeling).
- Progressive numbering with same course names is also confusing (Analysis I: Real Analysis, Analysis II: Metric Spaces, Analysis III: Reimann Integrals and Analysis IV: Complex Analysis).
- No evidence was found for the use of statistical software to teach statistical computations.
- Theory and practical are done separately in most of the subjects.
- Department has limited staff for statistics and applied mathematics.

- Unavailability of qualified senior staff especially in Computer Science to deliver lecturers.

The judgment assigned to this aspect is **"Satisfactory"**

2. Teaching, Learning and Assessment Methods

Strength/Good practices

- Availability of Learning Management System can be considered as a positive development.
- Availability of the course responsible lecturer together with instructors at practical classes is a good sign.
- An approximately 10 to 1 is a healthy ratio of students and instructors in practical.
- Printed lecture notes are provided well in advance to the students by some lecturers.
- Some lecturers use multimedia equipment during lectures.
- Standard assessment methods such as assignments and quizzes, mid semester examination are carried out.
- Even the answer scripts of general degree examination are sent for external correction.

Weaknesses

- In some lectures, hand written notes are given to the students.
- Limited persuasion from the staff to encourage students to ask questions is noticed.
- Basic facilities provided for lecture halls are poor.
- Students do not have proper printing facilities.
- Though a Learning Management System is up and running, the full potential use and students involvements have not been ensured up to an acceptable standard.
- Unavailability of separate resources (labs, equipments, staff, etc.) for the Department is a serious concern and the Department always shares resources with ICT center.

Judgment assigned to this aspect is **"Satisfactory"**

3. Quality of Students, including Student Progress and Achievement

Strength/Good practices

- Strict maintenance of 80% students' attendance for study programs is a good practice.
- Having an aptitude test for selecting students to follow computer science allows department to control the intake for Computer Science study programme.
- Very good pass rate of students for mathematics courses has been achieved.
- Students show good team work skills.

Weaknesses

- Students are not aware of national competitions and programmes for undergraduates conducted by other universities.
- The review team did not find any reliable evidence to believe that students' progress is being monitored.
- Number of students is less than the allocated number of students by the UGC in all levels.
- Less number of students (two) for special degree in Mathematics.
- No special degree is offered in computer science though there is demand from the students.

Judgment assigned to this aspect is **"Good"**

4. Extent and Use of Student Feedback

Strength/Good practices
- It is noted that collecting students' feedbacks has started in January 2009.
- A formal feedback process exists.
- Every lecturer obtains feedback from at least one of his/her classes.

Weaknesses
- Individual lecturer has not taken a summary of feedbacks that he/she gets with a list of follow-up actions.
- The review team did not find any follow up action taken after students' feedback.
- Students get higher weights for their GPA from the same lecturer.

Judgment assigned to this aspect is **"Satisfactory"**

5. Postgraduate Studies

Strength/Good practices
- Staff involvement in publishing their research work in nation and international fora is good practice.
- Department is planning to start two post graduate degree programs namely M Sc in Science Education and M Sc in Computation and Applied Mathematics.
- Some lectures have publications in refereed international and local journals.
- Some senior staff members are supervising post graduate research projects of students registered at the PGIS.

Weaknesses
- No ongoing research work leading to postgraduate qualification within the department.
- Most of the lecturers have poor involvement in research publications.
- No full time research students under any staff members in the Department.
- No attempts have been made to get external grants from outside bodies such as NRC, NSF, CARP, etc.

Judgment assigned to this aspect is **"Unsatisfactory"**

6. Peer Observation

Strength/Good practices
- A formal feedback process has been started.
- Some of lectures have participated in the process in the peer observation process.

Weaknesses
- Some lecturers have not participated in peer observation process yet.
- The review team did not find a formal process of moderating question papers

Judgment assigned to this aspect is **"Satisfactory"**

7. Skills Development

Strength/Good practices

- In addition to supporting students, ELTU provides facilities to language exams such as TOEFL, IELTS for junior staff.
- Students' need analysis conducted by ELTU at the beginning of courses and course customization accordingly is interesting good practice.
- Existence of Career Guidance Unit and the services it offers to students could be appreciated.
- Several external seminars (with few external and internal resource personnel) have been conducted in consultation with carrier guidance unit (CGU).
- Department has identified the significance of including practical skills of using mathematical software tools and has included them in the curriculum.

Weaknesses

- The students felt that there is a need for better coordination for searching for national and international student competitions and making students aware about such events.
- Existence of Career Guidance Unit (CGU) and the services it offers to students could be appreciated but improvements in coordination between CGU and academic departments and ELTU is needed also for curriculum review to get increased employability of passed out students (skills and subject knowledge).

Judgment assigned to this aspect is **"Good"**

8. Academic Guidance and Counseling

Strength/Good practices

- Availability of academic guidance and counseling is good.
- It was observed that both senior and junior staff members of the department actively engaged in counseling programs.
- There is a good cordial relationship and better understanding among academic staff and nonacademic staff.
- External students are happy with the services provided by both academic and the non-academic staff of the department.

Weaknesses

- There was no evidence of follow-up of the progress of the students who come for advice and counseling.
- Due to the lack of staff, same staff member play many different roles including academic counseling.

Judgment assigned to this aspect is **"Good"**

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.

A project work designed for computer science students could be extended to other streams as well (maths and statistics).
Two new degree programmes BSc (Computer Science) and Bachelor of Information Technology] and special degree in Computer Science (Ref. Information Guide for Students 2008-2012).

1. M.Sc in Science education and M.Sc in Computational and Applied Mathematics to be introduced.
2. 15 weeks projects only for Computer Science students is good and could be extended to other streams as well (maths and statistics).
3. Improving the Q&R in external degree programs to attract more participants.
4. Exploring possibilities of introducing business related IT course units both for postgraduate and undergraduate programmes in collaboration with departments (business, management, commerce, etc) in other faculties as well.
5. Establishing inter-university collaborations to deliver subject related courses also through eLearning technologies (by extending IntraNet to a ExtraNet)
6. Increasing the number of credits of MT 151 from 1 to 2
7. Introducing advance practical using Mathematica for year 2 as well.
8. Introducing Minitab statistical software to all levels. This software is readily available and has been recognized as the best teaching software for Statistics.
9. Although usage of whiteboard as main method of delivering lectures often, addition of presentations techniques (OHP, multimedia) could increase students attraction
10. Adding at least one printer to all computer labs.
11. Establishing a separate computer laboratory for department of mathematics.
12. Usage of continuous assignments and other assessments methods as means of students' progress monitoring
13. Students could be encouraged to participate in different competitions.
14. At least for special students, providing more interaction with similar students in other universities.
15. Available LMS could be used to streamline collection and processing students' feedbacks
16. In spite of practical difficulties and shortage of academic staff, it would be better if the department can offer few tailor made courses on Statistics and Mathematics for the students in other department where a good background in mathematics/statistics is required.
17. M.Sc. in Science education and M.Sc. in Computational and Applied Mathematics could be introduced.
18. Availability of many junior staff is a good opportunity to start research projects leading to postgraduate qualifications resulting both in getting qualified staff and research activities at the department.
19. As the demand has been noticed in other local universities, the department could start one year M.Sc. by research degree or M.Phil. degree in Mathematics.
20. The department could try to get external funding for research projects and also to finance research students through such grants (e.g. NSF, NRC and foreign grants).
21. Peer observations could be carried out on a regular basis in future covering all subject streams and all academic staff.
22. Discussions to formalize peer observation procedures to be adopted could be taken at the department staff meetings
23. A mechanism to monitor the fallow up actions taken as a result of observation is important

24. Students could be encouraged to form subject societies (e.g. Mathematical society).
25. Providing facilities for the students to participate national competitions/ activities.
    a. Department could develop a mechanism to have a better coordination between academic counselors and Head of the Department.
    b. Department could encourage students to get, available guidance and counseling services when seeking advice.

7. ANNEXES

Annex 1. AGENDA FOR THE REVIEW VISIT

Day 1-19th January 2009 (Monday)

08.30 - 09.00 am	Arrival of Team and Brief Discussion
09.00 – 09.30 am	Meeting with the Vice Chancellor, Dean/Science, Chairman and Members of the Internal QA
09.30 – 10.00 am	Discuss the Agenda with Head/Mathematics
10.00 - 10.30 am	Meeting with Head/Mathematics and Academic Staff at the Department with Tea
10.30 – 12.30 pm	Department Presentation on the Self Evaluation Report
12.30 – 13.30 pm	*Lunch*
13.30 – 14.30 pm	Observing Department facilities (Laboratory of Parallel Computing)
14.30 – 15.30 pm	Observing other Facilities (ELTU, CICT, Library, Agro Area, Medical Centre, Sports Center, New Science Block, etc.)
15.30 – 16.00 pm	Meeting with all Staff of Department of Mathematics with Tea
16.00 – 17.30 pm	Observing Documents

Day 2 - 20th January 2009 (Tuesday)

09.00 – 09.30 am	Observing Teaching - First Year (Computer Science)
09.30 – 10.00 am	Observing Teaching - Second Year (Statistics)
10.00 - 11.00 am	Observing Documents
11.00 – 11.30 pm	Meeting with Student Counselors, Academic Advisers, Director/CICT, Career Guidance, SDC and Librarian and Coordinators/ELTU and Physical Education
11.30 – 12.00 pm	Meeting with Special Degree Students (Mathematics)
12.00 – 12.30 pm	Observing Students' Presentations – Third Year Observing Documents
12.30 – 13.30 pm	*Lunch*
13.30 – 14.00 pm	Observing Teaching – Third Year (Mathematics)
14.00 – 14.30 pm	Observing Teaching – Fourth Year (Mathematics)
14.30 – 15.30 pm	Observing Documents with Tea
15.30 – 17.00 pm	Meeting with Technical and Non-Academic Staff

Day 3 – 21st January 2009 (Wednesday)

09.00 – 09.30 am	Observing Teaching – Practical Class (Mathematics)
09.30 – 10.00 am	Observing Teaching - Practical Class (Computer Science)
10.00 - 10.30 am	Tea
10.30 – 11.00 pm	Meeting with Senior Student Counselors
11.00 – 12.00 pm	Meeting with Head/Mathematics and staff
12.00 – 12.30 pm	*Lunch*
12.30 – 16.30 pm	Report Writing

Annex 2 .LIST OF STAFF AND OTHER PERSONS MET DURING THE REVIEW VISIT

Name	**Post**
Prof. N. Pathmanathan	Vice Chancellor
Prof. Selvarajah	Head/ Department of Education and Healthcare
Dr. A.G. Johnpullai	Head of the Department
Miss. S. Jeyanthiny	Temp. Tutor
Mrs. L. Prashanthan	Temp. Instructor
Mrs. Pratheepa	Temp. Statistics
Miss. N. Sulaxanadevi	Temp. Tutor
Mr. T. Ealasukanthan	Temp. Asst. Lecturer in Mathematics
Mr. T. Vinothraj	Instructor in Computer technology
Mr. Y. Nisanthan	Temp. Tutor
Mr. S. Hariharan	Temp. Instructor
Mr. A.L.S. Saabith	Lecturer (Prob)
Dr. T. Sritharan	Senior Lecturer Gr. I in Mathematics
Mr. P. Paramadevan	Lecturer in Mathematics
Mr. S. Thilaganathan	Temp. Asst. Lecturer
Mr. N. Tharshana	Temp. Asst. Lecturer
Mr. T Thagmakesthy	Temp. Asst. Lecturer (Maths Dept.)
Mr. S. Kajanthan	Temp. Asst. Lecturer in Mathematics
Librarian	
Medical Doctor at Medical Centre	
C. Sattrukalsinghe	Computer Application Asst.
A. Niroshan	Technical Officer (CICT)
R Jayasekera	Technical Officer (CICT)
Sudaran	
Dinesh	
Wijedaran	
Myuran	