SUBJECT REVIEW REPORT

DEPARTMENT OF PHYSICAL SCIENCES

FACULTY OF APPLIED SCIENCES
SOUTH UNIVERSITY OF SRI LANKA

29th to 31st December 2008

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.

Aspects of the subject review

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 Process

The review team consisted of the following members

1. Professor W.G.D. Dharmaratne, (Professor of Physics, University of Ruhuna, Matara)
2. Professor S Mohanadas (Formerly of University of Jaffna)
3. Professor R.P.De Silva (Professor and Head of the Department of Agricultural Engineering, University of Peradeniya)

Prof. Dharmaratne 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 29th, 30th and 31st of December, 2008.

On 29th morning, the review team met the Vice-Chancellor together with the Dean / Faculty of Applied Sciences and Head / Department of Physical Sciences. The Vice-Chancellor at this meeting briefed the reviewers on the present situation at the University.

The review team then 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 list of facilities observed is given in Annexure 4.

On the final day, the review team gave a feedback of the findings to the Dean of the Faculty of Science, 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 among the four 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 to function from 27th July 1995. It was then upgraded to the status of a fully-fledged university, SEUSL, from 15th May 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 calibre 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.

Overview Provision- Department of Physical Sciences
The Department of Physical Sciences consists of three academic units namely Chemistry, Earth Science and Physics, which offer the respective subjects as one of the three mains (core) subjects to the Bachelor of Science (B.Sc.) General Degree Programme. At present the undergraduate students from the department offer the following subject combinations to obtain the B.Sc. General Degree programme:

Biological Stream:
Biology, Chemistry, Computer Science
Biology, Chemistry, Earth Science
Biology, Computer Science, Earth Science

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

All students must select to follow one of the above subject combinations during the **first two academic years**. In the **third academic year**, a student has the option to drop **one subject** and select **optional courses** to cover the equivalent number of credits or proceed with the three core subjects.

Although the faculty is named as Applied Sciences, we realize the essence of a sound pure science background to propagate scholarship and intellect values. Hence, the hard sciences in the faculty and the department still inevitably cover the core of the hard sciences, and students are expected to cover a significant part of the applied aspects by choosing subjects such as Computer Science, Earth Science, Applied Statistics and Applied Mathematics. However, the Faculty and the Department is on constant exploration of how modifications to the system can be made to give an applied face to the degree programmes without significant dilution of the important pure sciences.

Mission of the Department
To provide learning experiences based on the best educational practices for all students served by the department. For physical science subjects, it is our intention to provide a comprehensive knowledge of the field of chemistry and/or physics and/or earth science while

taking their physical science courses. This comprehensive knowledge is defined as: a knowledge of course content, awareness of field specialties, awareness of work requirements, a respect for ethnic and gender diversity in the workplace, interaction with the scientific community through internships and invited interactions with professionals in the field, and competitive skills in computers, laboratory techniques, and literacy.

3. AIMS, LEARNING OUTCOMES AND PROGRAM DETAILS

As the department comprises of three academic units of independent disciplines, this section is subdivided and discussed.

3.1 Aims

Physics Unit:

- **Physics** is at the core of our intellectual understanding of nature and the foundation of many scientific disciplines. Physics is both a theoretical and practical discipline which continually evolves with profound scientific questioning, ranging from subatomic particles to the universe. Physics has been the core of many applied disciplines such as information and communication technology, instrumentation (including in medicine), space science, material science and all forms of engineering in general, and contributes immensely to scientific and technological advances. Therefore, Physics curricula and education in any type of institutional setup is demanding and challenging.

- In the Faculty of Applied Sciences at South Eastern University, teaching Physics has been a greater challenge given the scarcity in resources (both staff and equipment) which is mainly due to the problems emanating from unhealthy environments such as ethnic tension and war situation, remoteness from industries and poor infrastructure. In this backdrop, the **Physics Unit**, attached to the **Department of Physical Sciences** offers Physics as a major (core) subject for the B.Sc. (General) degree undergraduate students for the moment. In the B.Sc. (General) degree programme physics is one of the components where two more major disciplines are involved at least in the first two years.

- In this context, we **aim** to provide:
  - a sound knowledge in physics concepts enabling students understand real world physics problems (nature, industry, etc.);
  - a foundation to construct logical arguments based on physics principles;
  - an ability to conduct experiments, analyze the results, and provide valid conclusions with a measure on uncertainties and knowledge on limitations and constrains;
  - a good knowledge on laboratory safety, technical skills on handling equipment and ethics in experimentation;
  - a knowledge in use of software packages for the analysis of data;
  - an ability to write scientific reports and communicate scientific information;
  - provide a decent teaching-learning environment with a stimulation for critical thinking, logical reasoning, self-directed (independent) learning and update physics knowledge;
  - a motivation for group work, mutual cooperation, punctuality, commitment, hard work, etc.

- a dedication to portray and appreciate qualities such as fairness and equality, responsibility, accountability, consistency, honesty, sensitivity for student's reasonable concerns, etc.

Chemistry Unit:

- Chemistry is one of the central sciences, because its basic knowledge is essential for students of biology, computer science, physics, material engineering, environmental protection and industry. Therefore understanding chemistry is important for students across a wide range of sciences. Discovery, design and production of materials necessary for our day-to-day life, ranging from medicinal compounds to polymers, synthetic fibers, dyes, cement, semiconductors for computer industry and other products are based on chemical transformations. Chemical sciences include biochemistry, environmental chemistry, and chemistry of the environment, energy, applied and industrial chemistry and the structure and properties of materials. These are classified simply as physical, organic, inorganic, analytical and biochemistry and their sub divisions for easy learning.

- The United Nations has published nine major divisions of economic activities in manufacturing industries. Out of these nine, six industries require a chemical background. Therefore, chemistry plays a major role in the world job market (Career Opportunity). Based on these ongoing developments in science, upgrading the chemistry curricula regularly and promoting the research activities in a higher educational level is important.

- In the Faculty of Applied Sciences at South Eastern University of Sri Lanka, the Chemistry unit attached to the Department of Physical Sciences has two main objectives:
  1. Development of highly skilled graduates, who will work as scientific personal in industry, private enterprise, the public sector and education, and will contribute significantly to the technological advancement of Sri Lanka.
  2. Creation and promotion of new scientific knowledge via research in chemistry.

Earth Science Unit:

- **Earth science** is the name for all the sciences that collectively seek to understand Earth and its neighbors in space. It includes **geology**, **oceanography**, **meteorology**, and **astronomy**. Geology is traditionally divided into two broad areas—physical and historical.

- The **Earth Science Unit** attached to the **Department of Physical Sciences** offers Earth Science as a major (core) subject for the B.Sc. (General) degree undergraduate students who are with no previous geological knowledge, for the moment. In the B.Sc. (General) degree programme earth science is one of the components where two more major disciplines are involved at least in the first two years.

- The Earth Science Unit of the Department of Physical Sciences aims to provide the main centre of geological scholarship, research and knowledge within the Eastern Province of Sri Lanka and to ensure that this knowledge yields the maximum possible economic and environmental benefits. More specifically, the unit aims to provide courses of excellence, vocation and application which will enable graduates of Earth Science, and Chemistry, Physics, Biology, Computer Science with Earth Science to take their place alongside the best in the Sri Lanka

- In fulfillment of its aims, the unit has developed curricula that enable students to learn, test and question scientific methods and theory during a comprehensive investigation of the earth and earth materials. The curricula introduce methods of data acquisition, presentation and analysis, and equip students with both geological and transferable vocational skills. They are excellent in scope, sound in depth, and are fully abreast with modern developments in the field of earth sciences.

3.2 Learning Outcomes

Physics Unit:

In successful completion of the programme, students should have:

- gained a sound knowledge in physics concepts and able to use them in understanding nature and in simple applications;
- learnt to perform valid experiments and draw conclusions from appropriate data analysis;
- learnt to record experimentation and communicate the findings;
- demonstrated a dedication for self learning, critical analysis and update of physics knowledge.

Chemistry Unit:

In this context, the Chemistry unit aims:

- To produce well-qualified, determined, conscious and productive citizens in science and technology.
- To create a self-sustained educational and research system that positively impacts on Sri Lanka.
- To utilize and maximize the talents of the faculty staff and students, as a resource for consultation and research for Sri Lanka with a focus on resonating with the needs of the surrounding community, industry, business and government.

Two sets of objectives are proposed, one for students and another for staff. In order to attain the above objectives, the lectures and laboratory works are so arranged that the students can acquire both the fundamental and current subjects of chemistry. Intensive and extensive research works are performed by the staff members of the chemistry unit.

For successful completion of the degree program the Chemistry unit expects the following from students and the staff members to achieve the following.

A. From students,

1. To master general and advanced chemistry covering the accepted sub-disciplines,
   a) Learning the language and conceptual underpinnings of modern chemistry.
   b) Developing three-dimensional thinking: looking at molecules and estimating their properties.
2. To develop learning skills and problem solving techniques,
   a) How to read, understand the question and process the information. How to carry out independent learning
   b) How to approach problems and tasks: organizing information, defining goals, laying out strategies to reach goals and implementing the strategies.
3. To develop ‘holistic skills’,
   a) Developing the knowledge in the four main branches of Chemistry viz. Analytical, Inorganic, Organic and Physical Chemistry as part of an integral whole
4. To develop practical skills,

a) To develop good laboratory technique and make accurate measurements and observation, and to have a knowledge of chemical laboratory safety, chemical disposal and potentially harmful effects of chemicals on the environment.

b) To be able to use modern computer interfaced instrumentation and to have computer skills in order to be able to analyze data reliably, solve chemical problems and to enhance communication.

B. From staff

1) Teaching,

a) To conduct the teaching of all chemistry courses in the University at an internationally competitive level. The academic staff provides lectures and supervises laboratory courses. The technical staff ensures the smooth operation of the laboratory courses and assists during the assessment and examination time.

b) To develop quality degree programs with a balance between basic and applied chemistry. Emphasis shall be put on an interdisciplinary approach, always considering the specific needs of the community and the country.

c) To continuously update and improve teaching-learning methodologies by evaluating and implementing novel didactical concepts and/or electronic teaching aids.

2) Research and interfacial activities

All academic and technical staff conducts research with either a basic or applied orientation in order to:

a) Follow international developments in the staff members' field of expertise and improve the staff members' knowledge and experience to ensure quality teaching in the future.
b) Introduce graduate students via contemporary research to the scientific demands of their future professional career.
c) Present solutions for scientific problems of our country or international interest.
d) Academic staff offer consultancy to industry and government organizations in order to provide his/her special expertise for the further development of the country.
e) For every staff member, an individual balance between teaching, research and administrative engagement is sought and appropriately acknowledged. This balance might vary considerably between different individuals according to their aptitudes and interests and to the requirements of the department.

Earth Science Unit:

- Students will acquire the Earth Science content knowledge to fulfill requirements with the National and International Standards.

- Students will increase their ability to use critical thinking and use that ability to develop inquiry-based classroom activities.

- Students will become geologists with their field experiences and to help communities by continuing to build their knowledge of Earth Science content and pedagogy or by continuing to share their expertise with colleagues.

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

The faculty, and hence the department, has revised the structure of the degree programme annually for the last three batches of students. The self evaluation report for the subject review has presented the programme at the time of writing the report as described in Chapter 2, which is relevant only for second year students at present. A new structure is in place for the first year students as described by the Head of the Department at the meeting with the review team. The new structure is included in the handbook, which is distributed among the first year students. The review team focused on the new system.
Following table summarizes the new structure.

1st Main Subject	2nd Main Subject	3rd Main Subject
Biology	Applied Statistics	Computer Science
Mathematics I	Chemistry	Earth Science
	Physics	Mathematics II

The students in the faculty are supposed to select one subject from each of the above three baskets (1st, 2nd and 3rd main subjects) of subjects for the degree and to continue the same three subjects for the three-year period. The Department of Physical Sciences offers the subjects Physics, Chemistry and Earth Science. Students have some options in the 2nd and the 3rd baskets, however, they have no options in the 1st basket, because Biology and Mathematics I are compulsory for students following Biological Sciences and Physical Sciences streams respectively. The aim in the new system is to give the basic Biology knowledge to all students following Biological science and Mathematics knowledge Physical Science students, so that the students could follow the relevant Applied Science subjects. Three main subjects offer only 72 credits and the other 18 credits are from various disciplines which are compulsory and selected by the faculty with no choice given for students.
In the previous system, Sec. 2.5, Mathematics is not compulsory. Furthermore, the students could drop any one subject after second year and select some optional course modules during the third year. The review team finds that the new structure is more restricted than the previous structure, which has more optional course modules offered during the third year, that has been more attractive to students as reflected at the discussion with the students. The review team suggested merging the 1st and 2nd baskets with fundamental subjects to one basket and to have the second basket with applied science subjects. For example, Biology, Mathematics I, Chemistry, Physics, and Statistics could be in the basket I and Applied Science subjects could be in the basket II. Then the students could select two subjects from basket I and one subject from basket II with some options in each basket. However, the subjects in the second basket may have some prerequisites from the first basket. As an example, for Industrial Chemistry in basket II would require Chemistry in basket I. Furthermore, the review team suggested to give some freedom in selecting 18 multidisciplinary credits. Members of the department, who were very keen on the curriculum development, were in agreement with the suggestions made by the review team.

The contents of the course modules offered are adequate and comprehensive and in par with the similar courses offered in other Universities. The department has implemented the credit value system suggested by the Science Standing Committee of UGC.

The handbook of this year has mentioned the possibility of continuing four-year Joint Major and Special Degrees for first year students. The students are not certain about the possibilities yet. However, the curriculum has to be carefully developed depending on the available resources, the teaching load of the staff and the demand in fulfilling the mission of a Faculty of Applied Sciences.

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 knowledge and skills. The review team noted that a variety of teaching and learning strategies are used. These include lectures, practical classes, tutorial, field classes, self-learning, group work and computer based learning.

The Faculty library has a good collection of books and the students appear to be using the library regularly. The library is kept open for extended hours during the examination period but closed at 4.00 p.m. during normal working days.

The computer lab also provides sufficient facilities. The students use these facilities well for the teaching/learning process.

The laboratory facilities available for students are satisfactory. The practical classes are designed to acquire a range of subject specific skills. The students' work observed by the review team indicates that the students acquire necessary subject specific skills.

However, the review team noted that the learning outcomes of each course unit are not given in the student guidebook. Most of the students were unaware of the learning outcomes of the course units they follow.

Students expressed that in the subject area such as Biology, the memory part of the workload appears to be too heavy. The students have to spend many hours outside the normal allocated time to complete some of the Biology practical classes. Biology stream students told the Review Team that the latest revision of the curriculum design introduced in 2007/2008 made them to offer Biology as a compulsory subject throughout the three years, which made them difficult, compared to previous curricular design. Students also expressed that they did not participate any curriculum revision meetings.

The workload of teachers is too high because one department does the work done by 3 departments in other universities with limited number of teachers. Therefore the senior teachers do not have much time for research and postgraduate supervision.

Assessment strategies

The Assessment strategies are both formative and summative. These have been designed to assess the knowledge and skills of the students. The varieties of assessment methods such as continuous assessments and mid semester examinations are used by the Department to assess the students. In addition, field reports, tutorials and presentation skills are also assessed.

The students are aware of the methods of assessment at the beginning of the course unit.

All question papers are moderated and second marking is being done for end semester examinations externally by a senior member of the academic staff. The use of marking schemes is in practice when marking answer scripts.
Certain % of the continuous assessments and other assessments contribute to the final mark. This amounts to 30% for theory papers and 50% for practical papers.

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

Quality of admitted students.
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 has not much of a choice in admitting students.

The students are admitted to the faculty of science and the report has produced some collection of data relevant to the students who have taken one or more subjects from the department. From the students entry profiles of 2003/2004 batch to 2007/2008 batch it is evident that the number of students taking Chemistry, Physics or Earth Science has increased through out the period considered which is a good sign. Majority of students are from Ampara district. It is difficult to make any conclusions on the quality of admitted students from the Z-Score of the students, which remains almost the same during the last few years, due to low statistics. However, the total number of students has been increased in consecutive years.

Students progress and achievement
The students' performance at the final examination was also presented for students who have taken at least one subject offered by the department. It is a good sign that the success rate in completing the degree in three years has been increased during the last three-year (2005-2007) period. However, a significant fraction of students are making two to three attempts to complete the degree.

Employment record of graduates, who graduated in the academic years 2002/2003 and 2003/2004, was presented for two batches of students based on the statistics collected over the telephone. More than 50% of the graduates are employed as schoolteachers, some are in private sector and a couple of them are in foreign countries. However, a few graduates are still unemployed.

Review team had the opportunity to meet with some graduates and some of them are very much concern about difficulties in finding jobs due to some of the subject combinations they have followed. Therefore the review committee is in the view that the academic counseling should be given in selecting the subject combinations in the first year.

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. Students expressed happiness about their interaction with teachers and higher authorities.

The Department has perceived the importance of quantitative student feedback. The teaching process is evaluated by student feedback using a questionnaire since 2007. The questionnaire includes feedback on several aspects of teaching & learning such as student awareness of learning outcomes, organization & clarity of the lecture, motivation & interaction of the lecturer, speed & audibility of the lecture, etc. Student feedback data obtained by the lecturer have been analyzed to identify the strengths and weaknesses of each staff of the department. The Review Team recommends that the same practice may be extended to visiting staff as well as for practical classes. The outcomes of the quantitative student feedback have been brought to the notice of all academic staff by a comparative histogram in 2008. However no data is available for a lecturer to compare his/her progress over the years.

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. Also the Postgraduate Diploma programme in Environmental Management initiated with the support of ADB was offered only for one batch. 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 offer any special degree programmes, the task of initiating a strong postgraduate programme becomes even more difficult.

However, the review team noted that the Department has initiated collaborative research programmes with several institutions. Further, the staff of the Department possesses 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 and a formal questionnaire has been prepared. When the review committee inquired about the progress the Head of the Department could provide the copy of the questionnaire. Furthermore, 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 a fault finding mission and members of the department are in agreement.

In relation to peer observations the judgment of the review team is 'UNSATISFACTORY'

4.7. Skills Development

The review team has noted that the Department has provided opportunities to improve the skills of the students. These include ability to work in groups, analytical and creative thinking, independent learning, scientific writing, computer skills, and presentation and communication skills. In addition, 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.

There are provisions to improve generic skills of language proficiency in English and Computing. The inputs for the former are inadequate while the access to support services provided for improving computer skills is good. The staff of the ELTU does not seem to offer a coordinated progarmme. The review team recommends the Dean to take actions to have a better coordination between ELTU and the Department.

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

4.8. Academic Guidance and Counseling

When new students are recruited, they are provided with the faculty handbook and an orientation programme is being conducted during the first week of their entry. The handbook provides information about University, Faculty, Departments, subjects offered, subject combinations, academic programmes and details of course titles. On the first day of the orientation programme, the Vice-Chancellor, Dean of the Faculty, Heads of Department, Career Guidance Officer and Senior Student Counselor address the students. 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.

On discussion with students, they expressed that they were not clear about the applied nature of the courses until they entered the faculty. They also mentioned that they were not aware that only a limited number of students are permitted to follow the computer science as a subject; 15 physical sciences and 10 biological sciences students. The Review Team noted that this could be achieved by mentioning more details in the handbook and guidebook. Students were unable to understand why 4 years special degrees cannot be awarded and some special degrees in pure sciences. They should be properly and clearly enlightened at the beginning of the career at the faculty by academic counselors or personal tutors appointed by the department.

Whenever students encounter personal problems it has been found that the students can meet the faculty student counselors or any staff member to this effect. In addition there is a Chief Student Counselor for the university at main site, Oluvil to attend to the student welfares. However there is nobody to function as a professional counselor. For health related problems students can approach University Health Centre at the main campus.

There is a Career Guidance Officer who visits from main campus to facilitate students by giving trainings/seminars on job related matters. However he admit that such trainings have not been fruitful due to various reasons. Third year students expressed that they urgently require career guidance and awareness seminars with prospective employers and other stakeholders.

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	Satisfactory
Teaching, Learning and Assessment Methods	Good
Quality of Students including Student Progress and Achievements	Good
Extent and Use of Student feedback, Qualitative and Quantitative	Good
Postgraduate Studies	Unsatisfactory
Peer Observation	Unsatisfactory
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

1. The department is very concern on the curriculum and going through frequent revisions.
2. Has maintained the balance between the fundamental subjects and applied science subjects.
3. Some options for students in selecting two main subjects, 2nd main subject and 3rd main subject.
4. Some multidisciplinary course modules are introduced.
5. Course contents are adequate and comprehensive.

Weaknesses

1. Students have no choice in selecting 1st main subject and the department has no subjects offered in the first block.
2. No options for students in selecting multidisciplinary course units.
3. More restrictions in the new system in compared with the previous system.
4. No consultation with students in curriculum review.

5. Four-year degree is not in place yet.
6. Contents of course units are not given on the student guide.

The judgment assigned to this aspect is 'SATISFACTORY'

2. Teaching, Learning and Assessment Methods

Strengths/Good Practices
1. Use of variety of teaching and learning methods
2. Use of hand-outs
3. Use of Visual aids
4. Use of variety of assessment methods
5. Use of continuous assessment methods
6. Assessment of skills as well as knowledge
7. Informing the students at the beginning of the course the methods of assessment
8. Moderation of question papers and second marking of answer scripts externally.

Weaknesses
1. Learning outcomes of each module not clearly indicated in the prospectus
2. Theory courses taught sometime after field work
3. Library and computer laboratory not available to students after 4.00 p.m.

Judgment assigned to this aspect is 'GOOD'

3. Quality of Students, including Student Progress and Achievement

Strength/Good practices
1. Collection and tabulation of student information, Z-score, district, gender etc. of the new students.
2. Collection and tabulation of students' performance at the final examination.
3. Collection and tabulation of employment records on past graduates.
4. Performance of the students at the final examination has been improved during the last three years.
5. The faculty is producing some science graduates for schools in Ampara district.

Weaknesses
1. Analysis of collected data is poor.
2. The failure rate at the final examination in first time is significant.
3. Very few graduates are employed in the private sector.

Judgment assigned to this aspect is 'GOOD'

4. Extent and Use of Student Feedback

Strength/Good practices
1. Obtaining qualitative student feedback is in practice.
2. Obtaining quantitative student feedback procedure has begun two years ago.
3. Availability of comparative data (histogram) on the quantitative student feedback responses for the academic staff.

Weaknesses

1. Obtaining quantitative student feedback practice not extended to practical sessions as well to visiting academics.

Judgment assigned to this aspect is 'GOOD'

5. Postgraduate Studies

Strength/Good practices

1. Several research collaboration programmes have been initiated and maintained successfully.
2. The staff has a good understanding about the resources required for a postgraduate programme.

Weaknesses

1. Inability to continue the Diploma programme initiated with external support and funding.

Judgment assigned to this aspect is 'UNSATISFACTORY'

6. Peer Observation

Strength/Good practices

1. The members of the department are very positive on implementing a formal peer observation procedure.
2. A questionnaire is prepared.

Weaknesses

1. Peer observation practice has not jet been commenced in the department.

Judgment assigned to this aspect is 'UNSATISFACTORY'

7. Skills Development

Strength/Good practices

1. Adopted a series of measures for skills development of students.
- English language is the medium of instruction.
- Availability of sufficient computers with internet facilities
- Availability of sufficient books and periodicals

Weaknesses

1. English language training programmes are poorly coordinated.

Judgment assigned to this aspect is 'GOOD'

8. Academic Guidance and Counseling

Strength/Good practices

1. Availability of student handbook/guide.
2. Availability of an orientation programme.
3. Availability of Student Counselors for counseling.

Weaknesses

1. Non-availability of academic advisors or personal tutors.
2. Non-availability of well organized orientation programme

Judgment assigned to this aspect is '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. Merge the 1st and 2nd main subject blocks (in the present system) with fundamental subjects and let students to select two subjects from this block. Make the second subject block with applied science subjects, similar to the 3rd main subject block in the present system and the third subject can be selected from this block.
2. Give some options in selecting 18 credit hours on multidisciplinary course units.
3. Have a stable structure for the degree programme but subjects and course units can be added or reviewed frequently.
4. Formulate a four-year programme suitable to an Applied Science Faculty knowing the resources available and demand.
5. Publish the course content on the student guide and on the web page.
6. Academic advisers could help first year students in selecting subject combinations.
7. indicating in writing the learning outcomes, suggested reading material, methods of teaching and learning, and the assessment methods together with the course contents in the prospectus.
8. extending the working hours of library and computer laboratory up to 5.30 p.m. to those who can find their own transport.
9. Analysis could be done to quantify the progress on relevant parameters.
10. Reasons for some students not completing the degree in three-year period could be studied. Academic councilors assigned to each student could follow up the students' progress.
11. Obtaining quantitative student feedback procedure may be extended to practical sessions as well to visiting academics.
12. Findings of the student feedback practice may be carried out regularly to see the change over the years for each staff.
13. Initiating a postgraduate programme by research with strong collaboration with
    - an established postgraduate institute.
    - Set up a formal peer observation procedure.
14. Dean to take actions to have a better coordination between ELTU and the Department.
15. Continue English language support for the needy students even after the second year
16. Academic advisors or personal tutors may be appointed by the department.
17. A post of Senior Student Counselor may be created to the Sammanturai Centre and a suitable person may be appointed to coordinate the work at the faculty between the three departments.
18. Under the leadership of the Dean of the Faculty of Applied Sciences there shall be established committee for (i) career guidance unit and (ii) staff development unit with Director/Career Guidance Centre and Director/Staff Development Centre respectively and

department heads and one representative of the department in each committee; for example the Sammanturai Centre Committee for Career Guidance shall comprise Dean (Chaiman), Director/Career Guidance Centre from Oluvil main campus, three Heads of Departments, three departmental representatives (one from each department) and Asst. Registrar (function as Secretary).

7. ANNEXES

Annex 1. AGENDA FOR THE REVIEW VISIT

Day 1: 29th December 2008 (Monday)

08.30 am - 09.00 am	Arrival of Team
09.00 am - 09.30 am	Meeting with Vice Chancellor and Internal QA Team
09.30 am - 10.00 am	Discuss the Agenda with the Head / Physical Sciences
10.00 am - 10.30 am	Meeting with Head / Physical Sciences & Academic Staff at the Department with Tea
10.30 am - 12.30 pm	Department Presentation on the Self Evaluation Report.
12.30 pm - 01.30 pm	Lunch with all permanent academic staff
01.30 pm - 02.30 pm	Observing Department Facilities (laboratories, lecture hall etc.)
02.30 pm - 03.00 pm	Observing Other Facilities (Library, Computer Centre, ELTU, Staff Quarters, Student Hostel Facilities etc.)
03.00 pm – 03.30 pm	*Observing Teaching - Chemistry Practical for 1st Year* *Observing Teaching - Physics Practical for 1st Year* *Observing Teaching - Earth Science Practical for 3rd Year*
03.30 pm - 04.00 pm	Meeting with all Staff of Department of Phy. Sci. and Tea
04.00 pm – 05.00 pm	Observing Documents

Day 2: 30th December 2008 (Tuesday)

09.00 am – 11.00 am	Meeting with Director/Staff development Center, Director/Career Guidance Unit, Counselors, Academic Advisors and Demonstrators
09.00 am	*Observing Teaching - Chemistry Lecture for 1st Year* *Observing Teaching - Physics Lecture for 2nd Year*
09.30 am	*Observing Teaching – Earth Science Lecture for 3rdYear*
10.30 am	Tea.
11.00 am – 11.30 am	Meeting with non-academic Staff
11.30 am	*Observing Teaching - Chemistry Lecture for 3rd Year*
11.30 am – 12.30 am	Observing Documents
12.30 pm – 01.30 pm	Lunch
01.30 pm – 05.00 pm	Observing Documents with Tea
01.30 pm	*Observing Teaching – Earth Science Practical for 2nd Year*

Day 3: 31st December 2008 (Wednesday)

09.00 am – 10.00 am	Meeting with Undergraduate Students (General Degree)
09.00 am	Observing Teaching - Physics Lecture for 3rdYear
10.00 am – 11.00 am	Reviewers Discussion with Tea
11.00 am – 12.00 pm	Meeting with Head & Staff for Reporting
12.00 pm – 01.00 pm	Lunch
01.00 pm – 05.00 pm	Report Writing with Tea

Annex 2. THE LIST OF PERSONS MET

Vice Chancellor and Internal QA Team
Head / Physical Sciences & Academic Staff of the Department
Director/Staff development Center
Director/Career Guidance Unit
Counselors
Academic Advisors
Students (all three batches)
Demonstrators/Passed out students
Non-academic Staff members
Some students in hostels
Some staff in staff quarters

Annex 2. THE COMPLETE LIST OF DOCUMENTS EXAMINED

Documents were arranged systematically on tables and the Review Team could find all relevant documents conveniently. Following documents were examined.

Handbook, Syllabi of course units offered by each unit (Physics, Chemistry and Earth Science) in the department, Teaching materials, Examination question papers, marking schemes, Tutorials, Laboratory Handouts, Teaching material used by English Unit, The data collected for the analysis of student feedback on teaching and results of the analysis, Data collected to analyze students performance, employment etc. and the analysis of results, Some minutes of departmental and faculty meetings and documents on peer evaluations. Documental evidence for research publications.

Annex 4. THE LIST OF FACILITIES OBSERVED.

Department Facilities in Physics, Chemistry and Earth Science Units
- Laboratories
- Lecture halls
- Lectures conducted

Other Facilities
- Library
- Computer Center
- ELTU
- Staff Quarters
- Student Hostel Facilities
- Canteen
- Auditorium