SUBJECT REVIEW REPORT

DEPARTMENT OF BIOLOGICAL SCIENCES

FACULTY OF APPLIED SCIENCES
SOUTH EASTERN UNIVERSITY OF SL

29th to 31st December 2008

Review Team :

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1. SUBJECT REVIEW PROCESS

The subject review process of Sri Lankan Universities was initiated with the aim of evaluating the quality of education within a specific subject or discipline in the Higher Education Institutes of Sri Lanka. It is focused on the quality of student learning experience and student achievement. It is designed to evaluate the quality of both undergraduate and taught post graduate programs.

The main features of the subject review process as stated in the Quality assurance Handbook for Sri Lankan Universities by the CVCD and the UGC, in July 2002
are as follows.

- Peer review
- Production of an analytical self evaluation by the academic staff delivering the programs
- Review against the aims and intended student learning outcomes contained in the self evaluation
- A review visit of 3-4 days
- An overall judgment, contained in a short report

The subject review process of the Department of Biological Sciences, Faculty of Applied Sciences of the South Eastern University of Sri Lanka was conducted during 29th- -31st of December 2008 by a panel comprising Prof. S. P Samarakoon (University of Ruhuna), Prof Deepthi C. Bandara (University of Peradeniya) and Dr. P. Vinobaba (Eastern University, Sri Lanka).

The aspects of provision under review are as follows

1. Curriculum Design, Content and Review
2. Teaching, Learning and Assessment Methods
3. Quality of Students including student progress and achievements
4. Extent and Use of Student Feedback, Qualitative and Quantitative
5. Postgraduate Studies
6. Peer Observations
7. Skill Development
8. Academic Guidance and Counseling

The panel of 3 members visited the Department after reviewing the SER given to them earlier and conducted the review according to the schedule given in **Annex 1 – time table**

After completion of the review, the panel generated this report to be given to the QA specialist at the QAAC in Colombo.

2. BRIEF HISTORY OF THE UNIVERSITY AND THE DEPARTMENT

The establishment of the South Eastern University of Sri Lanka (SEUSL) and its predecessor the South Eastern University College of Sri Lanka (SEUCSL) in 1995 under the provision of section 24 A of the University act no 16 of 1978 as amended by act No 7 of 1985 no doubt fulfilled the long felt needs of the people of the South Eastern Region. It also coincided with more positive thinking and the policy of the government to broad base university education

by extending it to its periphery and less developed regions in the country (SEUSL Handbook 2002).

The South Eastern University of Sri Lanka commenced as a full-fledged university from 15th may 1996. In 1997 the Faculty of Applied Science was established at Sammanthurai. The Faculty of Applied Sciences (FAS) is one among the four faculties of the South Eastern University of Sri Lanka (SEUSL).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 consists of three departments namely Biological Sciences, Physical Sciences and Mathematical Sciences. The Department of Biology is of critical importance in fulfilling the major objectives of the university. Furthermore, being situated in an area blessed with forest and marine resources, the department has endeavored to excel in teaching and research in the ecological sciences.

The Department of Biology plays a central role in the University by providing fundamental lecture and laboratory courses introducing biological principles to students majoring in biology. The program under review is Biological Sciences stream of the Faculty of Applied Sciences. The current student number under the program is 72.

The Faculty of Applied Sciences (FAS) offers only the B. Sc general degree program. As more staff has joined the FAS after completing their postgraduate degree, a special degree program in biology and other subjects will commence from the academic year 2009/2010. At present biology is offered as a major subject along with either the other major subjects or optional subjects.

Dr Safeena Head/ Department of Biological Sciences explaining the SER to the review team

The Botany and Zoology Laboratories of the Department of Biological Sciences

3. AIMS, LEARNING OUTCOMES AND PROGRAM DETAILS

3.1 Aims

The following were stated in the SER of the Department of Biological Sciences

- Expansion of knowledge of biology through teaching and research.
- Providing students with knowledge and relevant skills that can be applied over a wide range of careers and postgraduate study options.
- Students will be made to appreciate the importance of Biology in the development of the country and will be stimulated to develop an enquiring and caring attitude to the natural environment in their everyday lives.
- Develop the student's competence at gathering information and its subsequent evaluation or analysis and transferable skills such as analytical, problem solving communication etc.
- Encouraging academic staff to undertake problem oriented research in biology in their field of specialization, which are of relevance and applicable to the regional, national, global requirements.

3.2 Learning Outcomes

The following are some generalised learning outcomes. The specific and detailed learning outcomes of each course unit are given separately at the beginning of each course unit in 'Lecture Guides' or orally to achieve at undergraduate level.

Knowledge: The student should acquire knowledge of the biological terms, facts, principles, concepts, procedures and processes.
Expected learning outcomes:
The student:
1. recalls biological facts, concepts and principles.
2. recognises biological apparatus, specimens, facts, concepts, principles etc.

Understanding: The student develops understanding of the terms, concepts and principles of biology.
Expected learning outcomes:
The student:
1. translates biological terms, symbols, formulae, data etc. from one form to another,
2. illustrates biological principles, concepts and phenomena with the help of diagrams,
3. identifies relationships between various concepts, processes etc.,
4. compares biological terms, concepts, principles etc.,
5. classifies specimens, facts, concepts etc.,
6. interprets biological concepts, data, graphs etc. and
7. explains biological concepts, principles etc.

Application: The student develops the ability to apply knowledge and understanding of biology in unfamiliar situations.
Expected learning outcomes:
The student:
1. analyses given data or observed biological facts and phenomena to identify and solve problems.
2. formulates hypotheses on the basis of observed facts and phenomena and given data,
3. suggests appropriate and alternative experimental procedures for a given purpose,
4. gives reasons for certain causes and effects in biological phenomena,
5. draws inferences, conclusions and generalisations,
6. predicts biological phenomena from the observed facts or given data, and
7. judges the relevance, adequacy and consistency of biological concepts and principles in given data, experimental procedures and other biological phenomena.

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

The curriculum development and revision process at the Department of Biological Sciences has occurred at mainly 3 stages. According to the literature available, the first curriculum developed in the department was in1997. This was a combination of courses on Botany and Zoology and the Faculty staff themselves had developed the curriculum. Around 2001, the Faculty of Science of the Peradeniya University has helped the Department of Biological Sciences in developing the curriculum. In 2005, the department has made major changes in the curriculum where they have included courses on Environmental Science. Hence the first

batch of students in the academic year1997/98 consisting of 30 students had actually read for a program in biosciences.

The biology curriculum from the inception was mostly composed of pure biological science fields- Botany and Zoology. This was because the faculty was established and commenced its programs to cater to some displaced students and most of the staff at that time were only with their first degree which were mainly on pure sciences.

The biology curriculum underwent a major revision to incorporate new biological fields such as biotechnology, enzymology, molecular genetics and applied aspects such as parasitology, fauna and vegetation types of Sri Lanka, conservation biology, quantitative ecology etc. in 2005 (Faculty Hand Book, 2006).

The revision was mainly aimed at giving a basic foundation and for furthering in environmental biology and thus the first two years deal with certain broad based general biological aspects. The third year covers some foundation courses on environmental biological aspects. The 3rd and 4th year special course units give a wider coverage of the applied aspects of environmental science.

The biology curriculum of the general degree has been designed for majoring in Applied Environmental Science in the fourth year and at the same time enabling the general degree graduates to compete for a wider range of openings in the employment market and higher studies. The 16 credits of the first two years are mainly foundation courses of certain major areas of biology on environmental aspects as well as on modern developments and the credits of the third year are introductory courses on certain environmental biological aspects.

The major demand by students throughout has been for a special degree programme in biology. In keeping with their demand the department has already designed two different programmes considering various aspects i.e. available resources, UGC recommendations etc. However, the students are very particular that it should be a conventional special degree in biology i.e. Botany or Zoology which the department with available resources is not in a position to offer at present.

Although a Special Degree in Botany was drafted and finalized it could not commence due to the difficulties in finding resources. A four year degree in Applied Environmental Science with the collaboration of other departments, and a double major in Biology and Chemistry with the collaboration of the Chemistry Division of the Department of Physical Science were two programs developed by the Department of Biology. The degree on Applied Environmental Science was proposed to be introduced as a new degree programme and has been accepted by the UGC.

During the revisions of the curriculum the Department has made attempts to make changes in the structure of the program and currently their curriculum is implemented as a course unit system in semesters where a biological science stream student has to choose biology as a main subject together with two other subjects

From the literature available and our observations at the review it is apparent that one of the weaknesses of the department where the curriculum is concerned is that from the beginning they have not been able to offer programs of a true applied science nature. The department however had taken much effort to launch a program at the inception and to fulfill the need at

the time and they cannot be held accountable for doing so considering the circumstances prevailing at the time. However it is very important for the Department to now come to terms with the program outcomes they are expected to deliver in the University system.

For this they should clearly consider the goals, needs and values of the Department, Faculty and University and its place in the University system. It is essential that stakeholders of such program outcomes are considered in redesigning their curriculum content. For this a major curriculum revision process would be essential .This would have to be undertaken as early as possible and some training on curriculum design would be worthwhile for the members of the Department of Biological Sciences. The strategic geometric positioning of the department in the University system gives them an advantage in designing their curriculum. One fact that they would have to keep in mind is that the programs must be of an applied science nature and that they should strive to achieve this as soon as possible. Even though the staffs are trained and possess pure science degrees it would not be a set back for such designing and would in fact be a blessing because all foundation courses start with a pure science background. Stakeholders, benchmarks, level descriptors and the corporate plan of the university must be taken in to account during the curriculum development and revision procedure.

Even though the curriculum would need some major revisions currently considering the situation in which it was designed the review team is of the view that the aspects of Curriculum Design, Content and Review could be judged as SATISFACTORY.

4.2. Teaching, Learning and Assessment Methods.

From the observation of teaching of classes in theory and practical for first, second and third year students it was apparent that the teachers were very committed to their teaching. In all classes we observed, the teachers were well prepared with the subject matter scheduled for the day. Since there were only a small number of students in each class, teaching was not a problem for the teacher. However it would be good if the teachers can use some student centered teaching/learning methods. What was observed was teacher centered didactic style of teaching. The teachers were well heard and the classroom environment was conducive. The teachers also used the Overhead projector and in some classes handouts were given to students. Some training for teachers on student centered teaching methods would be useful for this department. Use of questions in teaching, problem based teaching, use of discussions; case studies and role play are some methods that could be used for classroom teaching. Since the number of students is low, more assignments could be given to improve students writing skills and reading skills. The available computers would be adequately used for these purposes. When a class was conducted in a lecture room with multimedia facility the teacher used it for the lesson. Depending upon the intended learning outcomes of the lesson and course, teachers could be encouraged to use different teaching styles and teaching methods. Also they could be trained in the production and use of several teaching aids that would be appropriate for the courses.

The laboratories are arranged and maintained well and the technical and support staff are committed and give the necessary support for the conduct of the practical. Good teaching guides have been produced and used by the academic staff which is commendable. Each student is given the opportunity to gain hands on experience during the practical which will prepare them well for the future.

Assessments are conducted in a formative and summative manner which is acceptable. Continuous assessments are done and a percentage from the in course assessments is added to the final grade. The setting of papers, moderation and scrutiny was in order.

First year lectures by Ms Santhanam on cell aging and death

The review team is of the view that the Teaching, Learning and Assessment aspects are SATISFACTORY.

4.3 Quality of Students including Student Progress and Achievements

As with other Universities, the entry criterion of the Faculty is determined by the regulations of the UGC. However, it was noticed that the Z score range of the students who enter the Faculty is very wide. It is possible that even a single entry with a low Z score from an affected area would give this wide variation in entry Z score. Hence it would be best if the Faculty removes outlier Z scores when presenting data to give a better idea about the quality of students.

The GPA of students and the progress in improving the GPA was marginal. Also many of the students obtain employment in school teaching after graduation. A significant feature was that there were no failures in the practical component of subject. There were several failures in the theory component of subjects however.

The number of dropouts from the Department of Biology is of concern since many students tend to take other subjects in the 3rd year. When asked for reasons the students response was that there was much to study and much writing to do in Biology. Measures would have to be taken to improve the reading and writing skills of students. According to the staff, the region is not conducive for obtaining industrial training skills since it does not have many industries. The department should attempt to make some linkages even with industries in other regions

so that student placement is possible in the future as this would lead to greater employment opportunities also.

The review team judges the Quality of Students, Students Progress and Achievements are SATISFACTORY.

4.4. Extent and use of Student Feedback

A system of obtaining feedback from students regarding teacher and course evaluation was in place. A written questionnaire was used for this purpose. Since the class sizes are small teachers also obtain informal feedback. Teachers and department administration had taken the feedback seriously and had taken action to include revisions.

The review team is of the view that the Extent and Use of Student Feedback as SATISFACTORY.

4.5. Postgraduate Studies

There has been only one postgraduate program conducted by the department with assistance from the ADB. Other than this the department does not undertake postgraduate teaching. Qualified staff however could try to obtain research grants and attract research students and thereby build up a postgraduate program.

The Review team is of the opinion that Postgraduate Studies is UNSATISFACTORY.

4.6. Peer Observations

Currently there is no peer observation program at the department. The department members however have been exposed to some training on peer observation and hope to have a formal peer observation program in the future.

The Review team is of the opinion that Peer Observation is UNSATISFACTORY

4.7. Skills Development

Skills which were subjected specific were taken care of by individual teachers of the subjects and students were able to learn these skills during the practical classes.
It was observed that due to the unavailability of adequate space the laboratory equipment is shifted around depending upon the necessity. While this is a cumbersome process it is also not good for the equipment. Hopefully the Faculty would be able to make some space available to ease out the problem. This is especially necessary because taking the students to Peradeniya University as done at present poses many difficulties to staff and students.

English language skills were imparted in a 2 credit compulsory course in the 1st year (English for Biology). Another non credit course " English for Communication" was offered in the 2nd year which was a non credit, non compulsory course. The students English language skills appeared to be fair although much improvement is possible. It is recommended that the Instructor for the English program discuss with the department staff regarding the latter's requirement when drawing up the program and exercises so that the students improve their language skills as required for the departmental program.

It is recommended that teacher and course evaluation in the English program is undertaken. Also having the 2nd year English course as a compulsory Pass/Fail course would improve the English program. The Faculty should be able to set up an ELTU subcommittee and recruit contractual staff for a better service. Also it would be worthwhile to issue a certificate for successful completion of the English program.

The computer unit of the Faculty had satisfactory infrastructure available to conduct computer courses. The teachers could include some activities which would need computer applications in their courses in order to improve the students' capabilities in computer applications. The students showed concern about the inability to use the computer unit after 4 pm. Opening it for a couple more hours would be useful for such activities.
Including an industrial placement in the curriculum would greatly enhance soft skills as well as leadership qualities, team spirit and goal oriented, time bound training. The department should make all efforts to include such a placement in their degree program.
More exposure through field visits and industrial placements would enhance the graduate profile.

The Review Team Judged Skills Development to be UNSATISFACTORY

4.8. Academic Guidance and Counseling

From the discussion with students it was apparent that students did not have a good knowledge about the degree programs available at the department and faculty. According to them this information was not available in the website. Timely academic counseling during the orientation program would be helpful in advising the students regarding the selection of subjects and degree programs. The services from the Career Guidance counseling Unit was not forthcoming. Since the department is away from the main campus at Oluvil this needs attention. Students should be given awareness about the programs as well as career opportunities early so that they can make fair selections.

Hostel facilities were unsatisfactory. Health services, physical education facilities and canteen facilities also should be improved. The conducive environments are to be provided for learning at Faculty level for which the support from the administration from Oluvil is vital. Failure to do so would not motivate students as more than 95% students indicated that they would go to another University if given the opportunity.

In relation to Academic Guidance and Counseling the Judgment of the Review Team is SATISFACTORY.

5. CONCLUSIONS

1. Curriculum Design, Content and Review

Strengths / Good practices

- Slight in co-operation of the needs of the area into the course contents
- Acceptance for the need for curriculum revision
- Provision of an optional subject to the non biology students
- Curriculum review takes place where the experts are not from biology therefore a progress as expected has not yet been reached. However, the academics are ready to change with the assistances from the experts.

Weaknesses

- More easy optional courses available to students therefore they try to complete the degree with the easily scored subjects
- The academic staff are with the lower service in the specified grade
- They need training on curriculum design to revise the syllabi to meet the demands and service to the adjacent area
- Inadequate involvement of alumni and other stake holders participation in the curriculum review process

2. Teaching, Learning and Assessment Methods

Strengths / Good practices

- Moderation of General Degree question papers by external examiners/ expert out side the South Eastern University.
- Over the years the question papers seems to be changed with the improvement in getting the outcomes assessed
- Well maintained herbarium and museum specimen with the available specimen with the given space
- Academic and non academic staff in the department are committed and dedicated to students learning outcomes

Weaknesses

- Less opportunities to develop self learning abilities
- Comparatively less field studies to students in all years
- No indication on student centred learning
- Feed back questionnaires at the end of the course than in the middle, to improve the system in half way
- Problems in releasing the results early
- Teaching style should be improved

3. Quality of Students, Including Student Progress and Achievements

Strengths / Good practices

- Action taken in respect to external examiners reports
- Students are motivated
- Students are aware about the job market
- Students try to do courses on IT related subjects to improve the job opportunities
- Biological science teaching economics to enable them to go for entrepreneur development with the learnt Biotechnology, Microbiology etc.

Weaknesses

- Current increased length of study due to prevailing situation, and delay in external marking
- Low number of students in the third year biological science stream
- Disparity in the level of performances is very high

4. Extent and Use of Student Feedback

Strengths / Good practices

- Use of evaluation for questionnaire to obtain the students' feedback
- Statistical analysis of students feedback

- Discussion of findings of the student feedback with the head and staff at the departmental meetings

Weaknesses

- Not obvious

5. Postgraduate Studies

Strengths / Good practices

- Trying to assist the MSc Environmental Sciences taught course via ADB assistance
- One staff member is doing research for her PhD programme while others are doing considerable research with publications

Weaknesses

- Not available in the department alone

6. Peer Observation

Strengths / Good practices

- None

Weaknesses

- Not yet started since only few to share the burden of lectures to students
- Staff is occupied with lectures and practical

7. Skill Development

Strengths / Good practices

- Staff is committed and they take the students to University of Peradeniya to train them in biotechnology related skills
- Designing the curriculum for development of subject specific skills
- Opportunities for the improvement in IT and English language skills
-

Weaknesses

- Labs not provided with adequate facilities
- Limited interaction with other stakeholders regarding the required skill development
- Limited opportunities for skill development

8. Academic Guidance and Counseling

Strengths / Good practices

- Academic staff is committed and do their best
- Availability of updated Students' Faculty Hand Book

Weaknesses

- Unorganised academic, Career Guidance and Students' counselling system
- Professional counsellor service is not available from Oluvil to students at the Biological Sciences Faculty at Sammanthurai

Based on the observation made during the visit by the Review Team, the eight aspects were judged as follows:

Aspects Reviewed	Judgement
Curriculum Design, Content and Review	Satisfactory
Teaching, Learning and Assessment Methods	Satisfactory
Quality of Students, Including Student Progress and Achievements	Satisfactory
Extent and Use of Student Feedback, Qualitative and Quantitative	Satisfactory
Postgraduate studies	Unsatisfactory
Peer Observation	Unsatisfactory
Skills Development	Satisfactory
Academic Guidance and Counseling	Satisfactory

Meeting of the Review team at the end of the review for the Department of Biological Sciences

Acknowledgements
The Review team appreciates the excellent arrangements made by the department during the review visit. The staff members understand about the review process and displayed all necessary documents to assist the review. When ever the Review Team needed more information or documents the Head of the Department and the academic staffs provided the same with smiling faces. The non academic staff too facilitated the process with the common objective towards the development of the department to serve the students better in future years to come. The Review Team is grateful to all the categories of staff of the Department of Biological Sciences for the support rendered during the visit.

The Group photo with all staff of the Department of Biological Sciences and the review team at the dawn of the year 2009

6. RECOMMENDATIONS

The Review Team would like to make the following recommendations in order to improve the quality of education at the department of Biological Sciences and also give some importance to make the staff healthy in the laboratories to sustain them for longer years to assist in the Learning Teaching Environment.

- The Department of Biological Sciences may consider in revising the curriculum to adopt a student centred learning with the objective to assist the region.

- It is recommended that the next curriculum revision be held with the participation of all stakeholders as soon as possible so that you could implement it by year 2010.

- Increasing the components in fields' studies is recommended for Environment and Conservation with Wild Life's.

- The Department of Biological Sciences may explore the possibility of modifying teaching sessions from teacher centered to student centred learning in all years of study.

- The comments, suggestions and other feed back obtained from the moderators of the question papers and second examiners shall be considered at the curriculum review committee meetings.

- The Department of Biological Science may consider attracting more students to opt for biology in third year of study. With the available senior staffs you could consider attracting more of the postgraduate students by research. In parallel you could improve research culture among different grades so that the same recognition would create a

conducive environment to start the research degrees at the Department of Biological Sciences.

- Appointment of Professional counsellors is recommended to both Carrier Guidance or to Student counsellor and is recommended to have one person as coordinator for Sammanthurai. Then only the effective service could be provided to needy.

- The academic staff showed their willingness for change in curriculum so any opening will assist them to involve in this task soon to accomplish it soon.

- The non academics also expect local training for their longer service at the department where the possibilities could be explored to train them in local situation where ever possible.

- The faculty has to take the optional subject seriously and monitor the same evaluation process implemented uniformly for all subjects to make all are equal. Otherwise the drop out in Biology will lead to the problem in developing the department. The staff in biology are competent however the differences in the students mind like the easy subject option to fill their bag with the credit to earn high GPA could lead to the dropping the subject so careful approach is essential needed here. To some extent improvement in language proficiency is a hidden agenda. The biological science expectations, physical science expectations have to be blended in the ELTU course at Biological Science. Preferable suggestion would be to appoint one person from Physical Sciences and one person from biological sciences has to work closely in delivering the language to respective first year students and later on.

7. ANNEXES

Annex 1. AGENDA OF THE REVIEW VISIT

Department of Biological Sciences
Faculty of Applied Sciences
South Eastern University of Sri Lanka

Agenda for the Subject Review Visit - Biology

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, Dean and Internal QA Team
09.30 am - 10.00 am	Discuss the Agenda with the Head / Biological Sciences
10.00 am - 10.30 am	Meeting with Head / Biological 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 permanent academic staff of the department
01.30 pm - 02.30 pm	Observing Department Facilities (laboratories, lecture hall etc.)
02.30 pm - 03.30 pm	Observing Other Facilities (Library, Computer Centre, ELTU, Staff Quarters, Student Hostel Facilities etc.)
03.30 pm - 04.00 pm	Meeting with non academic staff of the Department of Biol. Sci. with Tea
04.00 pm – 05.00 pm	Observing Documents

Day 2: 30th December 2008 (Tuesday)

08.30 am – 09.00 am	Observing documents
09.00 am – 10.00 am	Meeting with undergraduate students
10.00 am – 10.30 am	Director/ SDC, Director/Career Guidance Director, student counselors
10.30 am – 11.00 am	Meeting with the Temp. Demonstrators with Tea
11.00 am – 11.30 am	Observing Teaching - Lectures (Lecture for 1st Year)
11.00 am – 12.30 pm	Observing Documents
12.30 pm – 01.30 pm	Lunch
01.30 pm – 02.00 pm	Observing Teaching - Practical Classes (Practical for 1st Year)
02.00 pm – 02.30 pm	Observing Documents with Tea
02.30pm – 03.00pm	Observing teaching – Lecture (3rd year students)
03.00 pm – 03.30 pm	Observing Teaching – Lectures (Lecture for 2nd Year)
3.30 pm – 4.30 pm	Observing Documents
4.30 pm – 5.30 pm	Meeting with Head and staff for reporting