SUBJECT REVIEW REPORT

DEPARTMENT OF SURVEYING AND GEODESY

FACULTY OF GEOMATICS

SABARAGAMUWA UNIVERSITY OF SRI LANKA

7th to 9th April 2008

Review Team :

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List of abbreviations

SUSL	Sabaragamuwa University of Sri Lanka
DSUGEO	Department of Survey and Geodesy
DCPRSG	Department of Cartography, Photogrammetry, Remote Sensing & GIS
GIS	Geographic Information Systems
GPS	Global Positioning Systems
ITU	Industrial Training Unit
GPA	Graded Point Average
GP	Grade Point
FGPA	Final Grade Point Average
CA	Continuous Assessment
RS	Remote Sensing

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1. SUBJECT REVIEW PROCESS

The purpose of the review of the academic programme of the Department of Surveying and Geodesy of the Sabaragamuwa University of Sri Lanka (SUSL) was to evaluate the quality of education including the facilities available, student learning experience, their achievements and the marketability of the students at undergraduate level.

In the process, the Review Team studied the Self-Evaluation Report (SER) submitted by the DSUGEO and all other relevant evidence made available. The SER and vital information on the general academic programme of the faculty tabled by the Dean of the Faculty at the commencement of the review provided a basis for the review. The Head of the DSUGEO presented the academic programme in greater detail at the commencement, and made available numerous documents during the course of the review process. Following the Head of Department's presentation, an agenda for the review visit was discussed and finalised.

The Review Team visited all the Departmental facilities like laboratories, computer rooms, drawing offices, and offices of the academic staff and related University facilities like the Main Library, Canteens and the Health Centre. Discussions were held with the academic and non-academic staff separately to obtain information required for the review.

Lecture sessions and practical sessions were observed by the Review Team, and a group of undergraduate students, drawn from each of the four years of the undergraduate programme, were interviewed. Presentations by students were observed.

The Review Team concentrated on the following aspects of the academic programme of the Department:

1. Curriculum Design, Content and Review.
2. Teaching, Learning and Assessment methods.
3. Quality of students, student progress and achievements.
4. Extent and use of student feedback.
5. Postgraduate studies.
6. Peer Observation.
7. Skills Development.
8. Academic Guidance and Counselling.

The Review Visit was made on 06th, 07th and 08th of April 2008. The members of the review team were: Prof. U.G.A. Puswewala, Department of Civil Engineering, (and Head, Department of Earth Resources Engineering) University of Moratuwa, Prof. Ranjith Premalal De Silva, Department of Agricultural Engineering, University of Peradeniya, and Dr. Jayalath Edirisinghe, Department of Civil Engineering, University of Peradeniya.

A large amount of documents related to the undergraduate programme were scrutinised closely, as listed below:

- Faculty Handbooks (Faculty of Geomatics).
- Minutes of the Senate.
- Minutes of the Faculty.
- Minutes of the Departmental meetings for curriculum revision, and on appointment of a consultant for curriculum revision.
- Examination criteria file.
- Records of a Tracer Study on graduates and their places of work.
- Final Year Project Reports (in soft form, CDs; 10 nos.).
- Project Proposals submitted by student groups.
- Geodetic Triangulation Reports (by individual students) (03 Nos. bound copies, 01 no. proposal).
- Field Visit reports (group-wise reports, 6-10 students in a group; 09 nos. hard copies).
- Task Cards (Instructions for Practical Work)
- Practical marks record for each student for all years; hard copy form and computer back-up.
- Examination answer scripts (05 packets).
- Survey Practical Reports (individual reports by students, including pencil-drawn maps and inked tracing paper maps).
- Flight plans for Photogrammetry (made by students, group-wise).
- Student feedback, in the form of evaluation of teachers.
- Self-evaluation forms by teachers.
- Subject Guide.
- File containing appointment details of examiners and moderators.
- Tutorial and handout files.
- Past examination papers from 2005 onwards, and papers with model answers, marking schemes.
- Files containing tutorial marks.
- Answer scripts of class tests (Geodesy II subject).
- Attendance records of students for each subject per semester.
- Sample lecture notes and assignments.
- Industrial Training Reports (02 nos.).
- Field books for survey practical work (directional method used).
- E-learning lecture notes and tutorials, as posted on the Web.

The Review Team made judgements as *good*, *satisfactory* or *unsatisfactory* on each of the eight aspects regarding the academic programme of the DSUGEO at the end of the 3-day review visit.

If any review aspect is found to be unsatisfactory, action is recommended to be taken by the Department within six months. If the Department wishes, it may request clarifications from the Review Team or make any comment on the Review Report

within a month of receiving the report. The Department is required to send a report on the action taken in response to review recommendations within one year. Finally, the Review Report will be published.

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

Sabaragamuwa University of Sri Lanka (SUSL) is one of the 15 universities in Sri Lanka. It was initially established as an Affiliated University College in 1991. In 1995, a committee was appointed by the Minister of Education and Higher Education to look into the possibilities of re-structuring the Affiliated University Colleges. The committee was headed by the Deputy Minister of Higher Education. In accordance with the recommendations made by the committee, the government decided to upgrade the Sabaragamuwa Affiliated University College to a National University, and amalgamate the two Affiliated University Colleges at Rahangala and Buttala, as the Uva Campus of the Sabaragamuwa University. Accordingly, the Sabaragamuwa University of Sri Lanka was established on 07th November 1995 by Gazette Notification, and the Uva Campus attached to the Sabaragamuwa University of Sri Lanka was established on 21st December 1995 by Gazette Notification.

The main campus of the University is situated off Pambahinna Junction near the town of Belihuloya. It is located in the southern foothills of the central mountain range, 160 kilometres from Colombo.

The SUSL comprises five faculties, one of which is the Faculty of Geomatics[1]. The Faculty of Geomatics was the successor to the Department of Surveying Sciences, which introduced the B. Sc. (Surveying Sciences) Degree Programme in 1997. The B.Sc. Surveying Science Degree Programme was unique as this was the first time in the history of the university system in Sri Lanka that such a degree programme was introduced by a university.

The Faculty of Geomatics comprises two Departments, the Department of Surveying and Geodesy (DSUGEO) and the Department of Cartography, Photogrammetry, Remote Sensing & GIS (DCPRSG). Both departments of the faculty were established in 2004, which makes them two of the youngest departments of the SUSL.

The first batch of students was admitted to the degree programme (of the previous Department of Surveying Sciences) in 1997 and graduated in 2002. Since then, a total of 227 students had graduated from the Department of Surveying Sciences/ Faculty of Geomatics. Presently the Faculty of Geomatics has a student population of about 210 with about 50 graduating annually.

[1] Geomatics is the discipline of gathering, storing, processing, and delivering of geographic information, or spatially referenced information. It is commonly defined to include the tools and techniques used in land surveying, remote sensing, Geographic Information Systems (GIS), Global Positioning System (GPS), and related forms of earth mapping.

The degree programme offered by the two Departments of the Faculty of Geomatics is a four-year (eight semesters) course leading to a special degree in Surveying Sciences (B.Sc. Surveying Science Degree), specialising in the following areas:

- Surveying & Geodesy,
- Photogrammetry & Remote Sensing, and
- Cartography & GIS.

The two Departments (DSUGEO and DCPRSG) jointly conduct the first five semesters of the B.Sc. Surveying Sciences Degree Programme as a Foundation Course, and the last three semesters are conducted by each individual Department as the Specialisation course. The specialisation offered by the DSUGEO is "Surveying & Geodesy".

The objective of the degree programme is to make the recipient graduate a person with academic qualifications and technical expertise to practice the sciences of Earth and Space measurements. The degree programme includes an industrial training component to enhance the practical skills to assemble and assess land and geographic related information, to use that information for the purpose of planning and implementation for the efficient management of the land, the sea and the structures thereon.

The course strives to provide qualified professionals to the public sector, private sector and foreign employment as well as to provide personnel to handle such land related aspects as Land Development, Land Settlement, Land Reclamation, Irrigation, Hydrography, Town and Country Planning, Forestry, Environment and all phases connected to the establishment of the Cadastre. There is greater emphasis on practical work using up-to-date equipment, computers and latest software. The course utilises the most modern technologies in the field of Geomatics.

The Department, being a young entity of less than four years of age, has a mostly young academic staff. They work with enthusiasm to produce graduates of the highest quality, but are also faced with problems in developing and furthering their academic and research careers. Opportunities must be availed for the young staff to obtain post-graduate qualifications, enhance their knowledge with short-term training, and establish a research culture at the Department, all of which are essential to develop the DSUGEO into a strong and sustainable academic department.

3. AIMS AND LEARNING OUTCOMES

3.1 Aims

Due to the strong interrelationship between the disciplines offered by the two Departments of the Faculty, common aims can be identified for the degree programme.

The broad objective of the programme of studies is to make the recipient graduate a person with academic qualifications and technical expertise to practice the sciences of Earth and Space measurements.

The aims of DSUGEO can be summarised as follows:

1. Expose students to the contemporary knowledge and recent advances in the technology, and to develop qualitative and quantitative aspects of research to international standards, so that it serves to further enhance the Degree programme.

2. Prepare students to be professionals through a well arranged practical programme which imparts confidence, skills and experience in working as a team, which qualities will remain with them throughout their professional careers.

3. Offer a friendly, responsive and supportive environment conducive to enthusiastic learning, high standards, and good completion rates.

4. Act as a scientific hub to share knowledge and experience at the international, national and industrial issues relevant to the profession.

5. Motivate academics and students in other departments of the University and outside to utilise and share human and physical resources available with the Department.

6. Commitment to develop the careers of academic staff in teaching and research so they could render their maximum service back to Department and thus create a solid academic environment.

3.2 Learning Outcomes

Geomatics is the modern scientific term referring to the integrated approach of measurement, analysis, and management of the descriptions and locations of Earth-based data, often termed spatial data. These data come from many sources, including earth based measurements, earth-orbiting satellites, air and sea-borne sensors and ground based instruments. Once these spatial data are acquired, they can be processed and manipulated with state-of-the-art information technology.

Thus, the recipient graduates should be able to:

- use terrestrial, marine, airborne, and satellite-based sensors to acquire spatial and other data, based on the scientific framework of geodesy.
- process these spatially referenced data from different sources into a common information systems with well-defined accuracy characteristics.

On successful completion of the study programme, the learning outcomes of recipient graduates can be summarised as follows:

1. Have knowledge and conceptual understanding of land surveying, from the fundamental to advanced topics, and the ability to apply these attributes comprehensively as a professional in the field.

2. Have personal and transferable skills in such areas as positive and independent thinking, critical ability, effective oral and written communication, computer literacy, and handling and analysing bulks of data.

3. Competence to carry out professional and research work under hard physical conditions, while optimising the resources.

4. Motivation for critical, self-directed learning and adherence to professional ethics.

5. For the graduates following the specialisation in Surveying and Geodesy, knowledge and understanding in Mathematics and Physics for Surveying, deep and conceptual understanding of physical Geodesy, and on different aspects and methods of surveying, hydrography and remote acquisition of data.

6. Complementary knowledge on land law, environment science, economics, and planning and management strategies.

7. Become creative and innovative citizens, have team-work capabilities, and have confidence in themselves to apply recent technological developments in the field.

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

The Faculty of Geomatics comprises two Departments, the Department of Cartography, Photogrammetry, Remote Sensing & GIS (DCPRSG) and the Department of Surveying and Geodesy (DSUGEO). Both departments of the faculty were established in 2004. Prior to 2004, the Department of Surveying Sciences existed in place of the Faculty of Geomatics.

The degree programme offered by the two Departments of the Faculty of Geomatics is a four-year (eight semesters) course leading to a special degree in Surveying Sciences (B.Sc. Surveying Science Degree), specialising in the following areas:

- Surveying & Geodesy,
- Photogrammetry & Remote Sensing, and
- Cartography & GIS.

The two Departments (DSUGEO and DCPRSG) jointly conduct the first five semesters of the B.Sc. Surveying Sciences Degree Programme as a Foundation Course, and the last three semesters are conducted by each individual Department as the Specialisation Course (with the last semester utilised entirely for industrial training). The specialisation offered by the DSUGEO is "Surveying and Geodesy".

The objective of the degree programme is to make the recipient graduate a person with academic qualifications and technical expertise to practice the sciences of Earth and Space measurements.

The first five semesters are common for all the students entering the Faculty and they follow a core programme termed as the "Foundation programme". The aim of the Foundation Programme is to cover the core subject matter and thus increase the overall knowledge of the student. Courses in the Foundation Programme are divided among the two Departments depending on the relevance. It includes subjects like Land Surveying, Geodesy, Remote Sensing, Photogrammetry, Cartography, Hydrography, Cadastre, Mathematics, Physics and Computer Programming, which carry a credit rating. In addition there are supplementary courses like English, Sinhala/Tamil, Management, Economics, Quantity Surveying and Architecture, which do not carry a credit rating. The practical work is arranged, especially in the case of Land Surveying and Geodesy, so that it is done continuously over a period of two weeks or one week at a time. This arrangement for practical work is quite suitable, given the type of skill and training the undergraduates require in specific subject areas.

At the end of the Foundation Programme, the students are selected for the Specialization Programme based on their preference and merit. The Specialization Programmes are conducted by the respective Departments over a duration of two semesters. In these two semesters, the DSUGEO offers subjects like Cadastral Surveying, Construction Surveying, Geodesy (advanced module), Land Management, Land Law & Land Valuation, Professional Practice, and Urban Planning for the specialisation in Surveying and Geodesy; in addition, the Surveying and Geodesy Research Project is conducted over both semesters. The final (eighth) semester is allocated to Industrial Training. The industrial training component is coordinated by the Industrial Training Unit (ITU) of the Faculty and aims at enhancing the practical skills of the students and also exposing them to the real working conditions and environment.

A GPA system is used to evaluate the student performance and a student may acquire in excess of 130 credits from the programme. All the courses in Foundation Programme are compulsory to all the students. The courses specified under a specialization stream are compulsory to the students who are specialising in that particular stream and they may select at least two other courses from the other streams as electives. The credit ratings have been allocated such that 15 hours of lectures per semester, 30 hours of laboratory practical work per semester or 60 hours

of field practical work (or project) per semester is equivalent to 1.0 credit. The Research Project has 5 credits, and Industrial Training 8 credits.

The curriculum design is good, given the fact that this is a young department still in the process of evolving; however, it can be suggested that titles of subjects to be more indicative of their specific contents, rather than being somewhat generic terms such as, for example, Mathematics I, II, III and IV. Given the nature of work the graduates will be involved in, it is recommended to enhance the statistics component under mathematics with one or two modules. Theory of errors needs to be treated comprehensively. It is commendable that the Department is actively pursuing a curriculum review process with input from experts in the subject areas, and from the profession. This process can be used to streamline and improve the flow of the undergraduate programme in the future. It is recommended that the specialisation as currently done in the Faculty of Geomatics to be treated as a major agenda item during the proposed curriculum revision.

The Curriculum Design, Content and Review methodology of the DSUGEO is adjudged **SATISFACTORY**.

4.2 Teaching, Learning and Assessment Methods

The knowledge on surveying sciences, with specialisations in Surveying and Geodesy, are transferred to the students through lectures, laboratory/office practical classes, field practical classes and field camps. Being a young faculty, the DSUGEO has seven Lecturers (Probationary) and five instructors. However, the human resources of the other Department in the Faculty, DCPRSG, are also available for the students, especially during the Foundation Course spanning the first five semesters, and thereafter when necessary. There are three classrooms available for the lectures, able to accommodate 50, 50 and 70 students, respectively. The DSUGEO maintains the Survey Laboratory where a range of surveying instruments, including modern equipment, is available; this is kept under a store-keeper, and facilitates various different field work in surveying sciences. The Department also employs eight Survey Assistants (retired personnel from the Survey Department) on contract basis, to provide logistics and support for field work. The Faculty has two clerks to serve both departments.

The physical facilities of the DCPRSG are also available to students. These facilities include two computer rooms, each able to accommodate 25 students, which have necessary RS/GIS software such as Arcview and ERDAS, and the Cartography Laboratory (drawing office) which can accommodate 40 students. The Photogrammetry laboratory of the DCPRSG has state-of-the-art equipment for three-dimensional visualisation.

Lectures are conducted using multimedia, white-board, black-board and overhead projector. In some lectures, handouts (lecture notes) are provided, and in some modules e-learning concepts are incorporated. Tutorials, practical assignment sheets,

and drawing/tracing papers for plotting work are also provided. Field Books are issued to students, for a sum of money, one at a time; they have to return the previous book to obtain a new one. The Triangulation Camp, conducted by the DSUGEO in the nearby mountains over several days, impart knowledge and skills essential for a surveying science graduate; this is done in groups, each group having 8-10 members. The proposal for the Triangulation Project is submitted by the group, but the final reports are submitted individually in bound form. Land surveying practical are conducted group-wise over a continuous period of two weeks, from 7.30am to 6.30pm daily. The availability of student accommodation in the close vicinity of the SUSL, and location of staff either close to the SUSL or within it, enables the successful conduction of the practical and field camps in the above manner. Instructions for practical, especially in surveying, are given in Task Cards. Visits are conducted to various establishments/places which practice surveying, calibration bases, and for the purpose of ground truth observations. Group or individual reports on the visits are submitted by the students. Participation of students at field and laboratory/office classes is compulsory.

During the specialisation programmes, students undertake a research project of one year duration. This is currently done group-wise. Each student group submits a research proposal, and upon its acceptance, conducts the research programme and presents the results by means of a report and an oral presentation. The research projects are conducted under the guidance of academic staff.

The Industrial Training component is conducted during the last semester, aimed at enhancing the practical skills and exposing the students to working environments. The Industrial Training Unit (ITU) of the Faculty coordinates this. This is evaluated by visits to the institutions where the students undergo training, and by oral and written presentations.

The students are encouraged to use the library and internet to broaden their knowledge. The SUSL Library possesses about 85000 books, and is officially open from 8.00a.m. to 6.00p.m. on Monday-Saturday during normal semester time, and from 8.00a.m. to 8.00p.m. on all days during examination time. However, there is a lack of textbooks on Surveying Sciences.

A GPA system is used to evaluate the student performances, and a student may acquire in excess of 130 credits to graduate. Almost all courses are evaluated using a combination of end-of-semester written examinations, continuous assessments (CA), and practical work (if relevant). Continuous assessment methods may consist of tutorials, quizzes, presentations, viva and short reports. Usually, the CA component and practical work (if relevant) amounts to a maximum of 40% of the total marks, but, depending on the course, this criterion may be varied; variations are informed to the students prior to the commencement of the course. For modules having a practical component, the students must obtain a minimum of 40% of total practical marks in order to pass the module. The pass mark for a course unit is 50% (C grade).

According to the grades obtained by the student, a grade point is assigned for each course unit, and a GPA is calculated for the semester. The Final GPA (FGPA) is the simple average of all semester GPA's obtained by the student. A First Class is awarded when the FGPA is equal to or more than 3.7. A student must obtain a minimum of D grade (GPA = 1.0) for all courses in each semester (including all supplementary course units, all project dissertations and for the Industrial Training component), and a FGPA of ≥ 2.0, in order to graduate. The evaluation criteria is in par with the criteria adopted by the other faculties of the Sabaragamuwa University.

The computation of FGPA as the simple mean of the semester GPA's gives more weight to the specialisation component (which has a lesser credit load per semester as compared to the credit load per semester of the Foundation Course); it is recommended to reduce the impact of the Industrial Training Component on the FGPA as its evaluation may not be uniform.

The students feel that projects like the Triangulation Project are very valuable in terms of their gain of knowledge, development of skills and field experience. They also feel that specialisation in their profession is important. Currently, the Faculty is experiencing difficulties in recruitment for instructor grades; this has forced one instructor to supervise more than one student group simultaneously. Latter practice is not encouraged, but the remedy requires certain changes in the current level of recognition accorded to the work of an Instructor by the profession.

The Teaching, Learning and Assessment Methodology practiced by the DCPRSG is adjudged **GOOD**.

4.3 Quality of Students including Student Progress and Achievements

Students entering the Faculty have a Z-score cut-off that is above that for Physical Sciences and Applied Sciences. The total intake to the Faculty is about 50 students per year. At present, there is a double batch in the programme. Through statistics for the past years, it appears that the pass rate of the students is quite good. The Faculty has produced 242 graduates up to the year 2007, with 08 First Classes and 71 Second Upper Classes.

Almost 100% of the past graduates are employed, with more than half of them in the government sector. The main employer in the government sector is the Survey Department, which recruits these graduates as Government Surveyors (Grade III/II). Other government sector employers are NARA, Land Use and Policy Planning Division, RDA, Ports Authority, Defence Forces, and the Central Bank. The Faculty also recruits some graduates. One third of the graduates are employed in the private sector and overseas. They work mostly on contract basis, usually for higher salaries as compared to government sector jobs. There is a great demand for these graduates in the Middle East. Because of the in-depth knowledge about surveying sciences of these graduates, they are able to perform very efficiently in employment.

It is a common problem in the University system that the students are not well exposed to the industry when they are asked to select their specialisations. It is recommended that a career guidance mechanism be introduced in the Faculty, to guide and advise the students.

The academic staff of the DSUGEO have noticed a certain lack of enthusiasm in attending lectures by the students. This is attributed to the fact that they can anyway find a good job with a simple pass. The students' reasoning is that due to the quality of lectures, they are not motivated to attend some lectures. The students point out that some lecturers have to conduct 03 courses and practical in one semester, which is a large work-load. They say that subjects like Land Surveying, Cadastre, RS etc. need to be taught by lecturers with specialisations; and question why subjects like Pascal Programming are taught to them. They also say that the time allocated for practical work is insufficient, and suggest that methods such as Theodolite Survey, Total Station and GPS be given more time. There are instances when one instructor handles three groups at the same time.

The view of the Review Team is that the Quality of Students including Student Progress and Achievements is **GOOD**.

4.4 The Extent and Use of Student Feedback, Qualitative and Quantitative

The Department had practiced obtaining student feedback through structured and/or open ended questions designed by different staff members on their own. Student feedback is obtained on feedback forms during lectures, and informally at meetings with staff, such as Faculty Board Meetings. Due to the difficulty in analysing such sporadic feedback qualitatively and quantitatively, the DSUGEO is now considering to implement a formal method to obtain student feedback using a structured questionnaire. The students say that feedback opportunities are very good.

During the discussions with the students, several ideas were suggested, which the Review Team would recommend for consideration by the Faculty. These are:

(i). Whether an industrial training could be arranged for 1-2 months at the end of the Foundation Course, which would help them to select their specialisation, and to know the field practices.
(ii). Increase the time allocated for survey methods like Theodolite, Total Station and GPS (Global Positioning System), perhaps by reducing the time allocated for survey methods like chain, compass and plane-table.
(ii). Develop collaboration with relevant Professional bodies and institutes like other Universities, Survey Department and ISM, Diyatalawa; this will help to update the Faculty and students of revisions of government regulations, etc.
(iii). Take remedial action to reduce large work loads of some lecturers and instructors; this of course means the increase of present staff numbers/ recruiting to fill the existing cadre.

The students are not happy about water supply at the SUSL, health facilities, recreational facilities, their contacts with university administrative staff (for example, examinations division) and to some extent service times of the Library. However, the students are quite happy about the accessibility of the academic staff, and about many components of the degree course like the Traingulation Camp. They are happy about the corporation extended by non-academic staff of the Department to them.

The view of the Review Team is that the Use of Student Feedback, Qualitative and Quantitative, is **SATISFACTORY**.

4.5 Postgraduate Studies

The DSUGEO does not offer any post-graduate studies currently. The Department is only two years old, and there is a lack of Senior Staff in the Faculty. Thus the DSUGEO lacks the infrastructure to commence any post-graduate programmes. It will naturally take some time for the DSUGEO to develop its postgraduate study capability.

The junior academic staff of the DSUGEO are interested in pursuing post-graduate studies. However, they face some difficulties in finding suitable post-graduate opportunities (they need a two-year research degree for promotion and confirmation), especially abroad. Local research degrees are one solution for this problem, but foreign exposure is preferable for the development of the faculty. Also, Probationary Lecturers encounter difficulties in updating their knowledge by attending workshops, seminars and conferences, as they are often not given leave for these purposes; it seems that their leave applications are turned down by the university administration even after being recommended by the Head of Department and the Dean. The Review Team is of the opinion that Probationary Lecturers can be allowed leave for these purposes according to the regulations in the university system.

The view of the Review Team is that the Postgraduate Studies component is currently **UNSATISFACTORY**.

4.6 Peer Observation

There has been no formal method of peer observation on lecturing up to the year 2007, and the DSUGEO has very recently started this practice. The department obtains the services of senior staff members or external examiners for the moderation and second marking of examination papers. There is a practice of self evaluation by academic staff (which had been commenced recently), and discussion of academic matters at Departmental meetings. Also, practical programmes are conducted by Instructors under the supervision of an academic staff member.

The view of the Review Team is that Peer Observation is **SATISFACTORY**.

4.7 Skills Development

The Faculty of Geomatics and DSUGEO has devoted much attention to development of the essential skills of the students. The extensive practical work in land surveying enables the students to conduct all types of land surveys, and trains them on proper handling and care for the instruments. The availability of sufficient numbers of modern surveying equipment, as well as older equipment to show the evolution of the profession, is a very significant advantage. Students develop the ability to handle highly sensitive instruments efficiently. The Triangulation Task develops such skills as field experience (such as camping and cooking) essential for a surveying science graduate, team-work, management of resources, and preparation and execution of work schedules, in addition to the academic component. The Research Project on Surveying and Geodesy is conducted over two semesters (sixth and seventh) to improve research capabilities, scientific thinking and analytical skills.

The series of presentations and reports done by each student during the course is intended to improve his/her communication skills. Submission of individual reports is practiced at several instances during the programme. The computer programming subjects are taught to improve the IT skills, and English and Sinhala/Tamil are taught to improve their language skills. Subjects like Physics and Mathematics impart knowledge on principles behind modern equipment/techniques and improve the mathematical skills.

The Industrial Training component (during the eighth semester) is intended to give students practical experience and skills and to improve their competence. It serves as a transition stage for the student to move from the university to the working environment.

The Review Team finds that Skills Development is **GOOD.**

4.8 Academic Guidance and Counseling

At the SUSL, there is a Senior Student Counsellor. Each Faculty has three student counsellors, who are academic staff members who attend to student counselling as a secondary job. Academic guidance is done by all staff members unofficially, whenever a need arises. The evaluation criteria of the Faculty are given in the Faculty Handbook, which is issued to the students.

For other problems, like social issues, the students can contact the student counsellors of the Faculty, and may be directed to the Senior Student Counsellor and/or the Medical Centre. Medical Centre handles healthcare and psychological issues. Wardens and sub-wardens are available at the hostels, who handle any issues related to the residency in hostels; the student counsellors seldom visit the hostels. The problems encountered by students are mainly on examination phobia, English medium, and socio-economic matters (such as having to work while studying, conducting tuition classes, etc.).

An orientation programme is conducted for the students entering the University, which familiarises the students to the environment in the University and helps the students to cope with being away from home.

The Review Team finds that Academic Guidance and Counselling is **GOOD.**

5. CONCLUSIONS

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

Aspect	Judgement
Curriculum Design, Content and Design	Satisfactory
Teaching, Learning and Assessment Methods	Good
Quality of Students, Student Progress, and Achievements	Good
Extent of use of Student Feedback	Satisfactory
Postgraduate Studies	Unsatisfactory
Peer Observation	Satisfactory
Skills Development	Good
Academic Guidance and Student Counselling	Good

The overall judgment is suspended

6. RECOMMENDATIONS

1. It is recommended that the DSUGEO and the Faculty of Geomatics vigorously pursue the process of Curriculum Revision, which has already been initiated.

2. It is recommended that the academic staff of the DSUGEO and DCPRSG, after revising the curriculum, refine it by obtaining views of the eminent persons in the profession, academics from other universities and other related persons, through a series of workshops; questionnaires sent to alumni and others related to the profession can also be used.

3. It is recommended that allocation of specialisations to students as currently practiced by the Faculty of Geomatics be re-scrutinised during the curriculum revision process. It is worthwhile to study the current idea among the staff to offer a core programme on surveying sciences to the students, and offer

specialisations only to a lesser number of students filtered out from the general body of students.

4. It is recommended to avoid somewhat generic names in the revised curriculum as much as possible (such as, for example, Mathematics I, II, III and IV), and to rearrange modules to reflect a greater depth of the course. Increase of the contents on statistics and error theory are also suggested.

5. It is recommended to enhance the carrier guidance mechanism for the students; it can also help them in their selection of specialisations.

6. It is recommended to extend assistance to Probationary Lecturers in the Faculty to obtain post-graduate qualifications, and to remove current administrative obstacles faced by them when they apply for leave to attend conferences, work-shops, etc. to update their knowledge. Some of the probationary staff are already following local post-graduate research programmes; however, foreign exposure for probationary staff is also preferred, and some link programmes with foreign Faculties of Geomatics may be explored.

7. It is recommended to set up a formal Leave and Awards Committee for the SUSL, consisting of the Vice Chancellor, Deans, Heads of Departments, and the Senior Assistant Registrar of Establishments (Academic) to approve leave requests from the academic and academic support staff, based on the Establishment Code. This committee can also grant special leave requests by other categories of senior staff.

8. It is recommended to find a way to remove current difficulties faced by Instructors; they are required to use the finger print machine to work from 7.30am to 4.00pm, whereas the practical work may go on until 5.30pm; they have to attend to field work such as Triangulation Task, over a number of days and nights. Perhaps, their working hours may be made flexible, in order to add up to a specified number of hours per week/ semester.

9. It is recommended to take an effort to get the service of Instructors at the SUSL be recognised professionally, as work experience. They have limited opportunities for career progress, as their surveying field work practice is not currently recognised by other organisations, for example, Survey Department. Under these circumstances, the Faculty has difficulties in retaining/ recruiting Instructors.

10. It is recommended to make more material on surveying sciences be made available at the Library.

11. It is recommended to strive to avoid using one Instructor to supervise and guide more than one student practical group at a given time; this of course requires the filling of the Instructor cadre, which is found to be a difficult task currently.

12. It is recommended that the Survey Laboratory be placed under a Technical Officer trained in the handling and operation of the various types of equipment available there, along with a laboratory attendant. A more spacious room is also essential for the laboratory.

13. It is recommended that the Department plan to have an appropriate annual allocation of funds for recurrent and capital expenditure, to cover the faster rate of replacement of modern electronic survey equipment and their batteries.

14. The Survey Attendants (who are on contract basis) work for long hours during various tasks, and request that their rates of payments be revised, and some form of housing be provided close-by or inside the premises. These requests may be considered.