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SUBJECT REVIEW REPORT

DEPARTMENT OF PHYSICAL SCIENCES



FACULTY OF APPLIED SCIENCES RAJARATA UNIVERSITY OF SL

12th to 14th October 2009

Review Team :

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1 safeguard public confidence in Sri Lankan 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 (HOD), members of the academic and non-academic staff, undergraduate students, postgraduate students, alumni, academic administrators, and students. 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.

- 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 observation
- 7. Skills development
- 8. Academic guidance and counseling

The Review Process

The review team consisted of,

- 1. Prof. S. Mohanadas, Former Vice Chancellor, University of Jaffna, (Team Chair),
- 2. Prof. Sudath R. D. Kalingamudali, Department of Physics, University of Kelaniya,
- 3. Dr. Prasad M. Jayaweera, Department of Computer Science, University of Ruhuna.

The Self Evaluation Report prepared by the Department was provided to the review team on 01st October 2009 by the Quality Assurance and Accreditation Council of the University Grants Commission. The review team carried out the review process on 12th, 13th, and 14th of October 2009. On 12th morning, the review team met the Vice-Chancellor together with the Dean/Faculty of Applied Science (FASc), Chairman/Internal QA Unit and Head/Department of Physical Sciences (DPSc). The Vice-Chancellor at this meeting briefed the reviewers on the present situation at the University.



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e agenda for the review process with Head of the ulty. The Agenda for the review visit is given in Annex eview team met the Head of the Department and other

members of the academic staff. The Head of the Department gave a presentation on the contents of the Self Evaluation Report which was followed by a discussion.

The review team during the course of the visit had discussions with the members of the academic staff, technical officers & non-academic staff, student counsellors, directors of career guidance centre & staff development centre and the present undergraduates following the B.Sc. programmes as well as past students. The list of persons met is given in the Annex 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, peer observation reports etc. The complete list of the documents examined is given in Annex 3.

The review team also examined the facilities available for teaching and learning. These included the lecture theatres, teaching laboratories, equipments, library, etc. The list of facilities observed is given in Annex 4. On the 14th October 2009, the review team gave a feedback of the findings to Head of the Department and other members of the academic staff.

Publications the review report

A report will be prepared after the review visit incorporating the findings of the review team. In the report, the strengths and good practices will be highlighted and the weaknesses will also be stated together with some recommendations. Each aspect will be given a judgement of good, satisfactory or unsatisfactory. The draft report will be sent to the Department and the feedback will be obtained. If there is disagreement with any judgement, it would be resolved by the Quality Assurance and Accreditation Council (OAAC) through discussion. The judgement will be submitted to the Standing Committee on Quality Assurance of the UGC for approval. After its approval, the report will be published in the QAAC website, www.qaacouncil.lk. The Department has to improve the quality of the aspects that receive a judgement of unsatisfactory within 6 months of approving the judgements by the Standing Committee on Quality Assurance of the UGC. The primary source of documented information for this review was the self-evaluation report prepared by the DPSc. The review team was also provided with supporting documents by the Department including the curriculum, detailed syllabi, teaching materials, student work records, question papers, marking schemes, answer scripts, marks, student feedbacks and peer observations. The team had useful discussions with the Vice Chancellor, Dean of the faculty and the Head/DPSc & senior and junior academic staff members, Co-ordinator of the English Language Teaching Unit, Career Guidance Coordinator, Director/Physical Education, Chief Student Counsellor & students counsellors, non-academic staff members and students from the first, second, third and final years. The team also visited laboratories (Chemistry lab, Physics lab and Computer labs), lecture rooms at department level, library, computer unit, English Learning Centre, Hostels, Playground and Guest House.

Human Resources of the Department

Head of the department submitted a list of names containing academic staff, non-academic staff and visiting staff at present of the DPSc. There is one Professor, five Senior Lecturers, nine Probationary Lectures, five Temporary Asst. Lecturers, seven Demonstrators, five



hree Technical Officers, one Programme cum System n Assistants, three Laboratory Attendants and two

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

The Faculty & its Departments

The Rajarata University of Sri Lanka (RUSL) was established in November 1995 under section 21 of the Universities Act No.16 of 1978, by amalgamating the Affiliated University Colleges in Central, North-central and North-Western provinces. The main campus located in the historical town of Mihintale which is at a distance of about 10 km from Anuradhapura, a city of rich heritage and cultural value in the North-central province, covers about 140 acres of land dedicated primarily to academic, administrative and student facilities including residential, recreational and medical use. The university comprises the faculties of; a) Agriculture b) Applied Sciences c) Management Studies d) Medicine and Allied Sciences e) Social Sciences and Humanities

Since the university was set up with makeshift arrangements, the faculties have been locationally dispersed the faculty of Medicine and Allied Sciences at Saliyapura, Faculty of Agriculture at Puliyankulama and the other three at Mihintale. At the inception of the Rajarata University, the Central Province Affiliated University College (CPAUC) in Polgolla, located at a distance of 140 km from the main campus at Mihintale, Anuradhapura was amalgamated to the RUSL as its FASc. The immediate task of the FASc at that time was to upgrade all the students of the CPAUC who had successfully completed their Diploma requirements, to the Graduate level. On this task the FASc was inaugurated on 10th January 1997 to commence the third year Degree Programme with a batch of 102 students, who subsequently graduated in 1998. The first batch of students who were directly sent by the UGC to follow the degree programme was enrolled in November 1997. After functioning for nearly 10 years at Polgolla, the Faculty was finally established in the premises of the main campus at Mihintale, on 16th January 2006 upon completion of Stage I of the building complex.

An Overview - Department of Physical Sciences

The FASc, Mihintale consists of two Departments *viz*: Biological Sciences and Physical Sciences. The Department of Biological Sciences offers course units in the fields of Botany/Zoology/Biology/Health Promotion while the Department of Physical Sciences offers course units in the fields of Chemistry, Physics, Mathematics, Computer Science (CS) and Information & Communication Technology (ICT). All the courses are offered in the English medium. As such, the Faculty conducts 18 weeks intensive course and an ongoing course in English Language, for students to be competent to follow lectures and comprehend the courses taught by the two Departments. From its inception, the Faculty follows the course unit system. The programmes are completed within 6 semesters in the case of 3 year degrees and 8 semesters in the case of 4 year degrees. The Department of Physical Sciences offers course units for the following degree programmes at present.

- a) B.Sc. (General) 3 year degree in Applied Sciences
- b) B.Sc. 4 year degree in Applied Sciences
- c) B.Sc. (Joint Major) 4 year degree in Biology & Physics
- d) B.Sc. (Joint Major) 4 year degree in Chemistry & Physics
- e) B.Sc. 4 year degree in Industrial Mathematics



At present the Department has 22 academic staff, several visiting staff members, 15 academic support staff and 07 non academic staff members. The Department serves a total student body of 313 including the students of the Biological Sciences stream.

3. AIMS AND LEARNING OUTCOMES

The Department of Physical Sciences offers a variety of course units, which enable the students to get a better understanding and to develop the necessary skills in the subject areas of Chemistry, Physics, Mathematics, CS and ICT.

<u>Chemistry</u>

Aims;

- To present chemistry as a coherent but developing body of knowledge, principles and theories.
- To develop an appreciation of the usefulness and limitations of the procedures used by chemists and a logical approach to problem solving in a wider context.
- To emphasize the practical nature of chemistry, encourage practical and investigative skills with correct and safe laboratory techniques, and to encourage students to be involved in research projects which would be beneficial to the surrounding community as well as the country.
- To develop self learning skills of students through co-curricular activities such as field trips, industrial visits to pursue various aspects of chemistry.

Learning outcomes; On successful completion of the programme, students

- Realize the importance of proper understanding of the fundamentals and the key concepts of chemistry when they are put into effect to address many global scientific issues.
- Acquire hands-on experience in using correct laboratory techniques and skills to complement the theoretical knowledge.
- Acquire a range of abilities to observe the factors critically, analytically and collectively.
- Gain experience in undertaking scientific investigations, data processing and analysis, writing reports, presentations and effective scientific communication.

Physics

Aims;

- To develop studentsø understanding of Physics as a continually developing body of knowledge.
- To bring students working individually and with others in various experiences that are related to the theoretical concepts considered in the course.
- To develop investigative and problem-solving skills.
- To provide knowledge and understanding about fundamental concepts related to natural phenomena and their causes, the historical development of these concepts and their application to personal, social, economic, technological and environmental situations.



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mpletion of the programme, students;

scientific understanding and technology have changed c thinking.

- Analyze the ways in which models, theories and laws in physics have been tested and validated.
- Justify the appropriateness of a particular investigation plan.
- Assess the impacts of applications of physics on society and the environment.

Mathematics

Aims;

- To equip students with the technical appreciation, skills and knowledge appropriate to graduates in mathematics.
- To promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion and to develop studentsø capabilities to formulate and solve mathematical problems.
- To develop studentsø appreciation of recent developments in mathematics and the links between the theory of mathematics and its practical application.
- To provide students with opportunities to study advanced topics in mathematics, engage in research at some level and develop communication and personal skills.

Learning outcomes; On successful completion of the programme, students;

- Interpret and draw inferences from mathematical models such as formulae, graphs, tables and schematics.
- Employ quantitative methods such as arithmetic, algebra, geometry or statistics to solve problems.
- Estimate and check mathematical results for reasonableness.
- Recognize the limits of mathematical and statistical methods.

Computer Science

Aims;

- To gain experience in computational practice such as analysis, specification, design, implementation, and testing resulting in quality computer software solutions.
- To provide a sound background knowledge in theoretical CS and both the mathematical and analytical maturity necessary to allow them to follow and adapt to technological changes in their discipline.
- To demonstrate the knowledge and spiritual foundation necessary to make ethical and responsible choices. They will be prepared.
- To use their computing skills to make a positive impact on society.

Learning outcomes On successful completion of the programme, students;

- Acquire sound knowledge in CS fundamentals enabling them to understand CS as a problem solving tool.
- Apply fundamental principles and methods of CS to a wide range of problems.
- Understand design and performance requirements of software systems

Information & Communication Technology

Aims;

• To provide students with a broad knowledge in ICT that will equip them with the technical and personal skills necessary to play an effective role in education, industry, commerce and the public sectors.



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commerce, and the public sectors with professionally (IT) personnel who are capable of responding to the

To provide practical skills in project management.

Learning outcomes On successful completion of the programme, students;

- Show confidence in applying their skills and aptitudes to the planning, analysis, design and implementation of computer systems.
- Creatively tackle problems and effectively implement systems within an agreed time scale.
- Get more opportunities to pursue higher studies in IT.

The Structure of the Degree Programmes

At present, the following degree programmes are offered by the FASc.

- B.Sc. (General) 3 year degree in Applied Sciences
- B.Sc. 4 year degree in Applied Sciences
- B.Sc. 4 year degree in Industrial Mathematics
- B.Sc. (Special) 4 year degree in Applied Biology

(Specialization area I: Biodiversity & Conservation) (Specialization area II: Fisheries & Aquaculture Management)

- B.Sc. (Joint Major) 4 year degree in Biology & Physics
- B.Sc. (General) 3 year degree in Health Promotion
- B.Sc. (Special) 4 year degree in Health Promotion
- B.Sc. 3 year degree in ICT
- B.Sc. 4 year degree in ICT

The students admitted to the Degree Programmes of the FASc, are candidates who had offered combinations of the following subjects for the G.C.E. (A/L) Examination to gain entrance to the University *viz*: Biology, Chemistry, Physics, Combined Mathematics, Advanced Mathematics and Agriculture. It is the intention of the Faculty to ensure that a student entering the Faculty with any combination of such subjects could in the third and fourth years select a particular field or fields of Applied Sciences of his/her choice. The first and the second year courses are designed in such a way that a student may select a specific area/s in Applied Sciences in the third year/third and fourth years as depicted in Figure 1. However, this is not applicable to the students following the degrees of Health Promotion, who are selected by entry, through a separate window at the time of admission.



Figure 1. The Basic Plan of Action of the B.Sc. Degree Programme



EAM

nd Review

DPSc conducts courses for 3 year B.Sc. degree programmes in Applied Sciences and ICT; 4 year B.Sc. degree programmes in Applied Sciences, Industrial Mathematics and ICT; and B.Sc. (Joint Major) 4 year degree programmes in Biology & Physics and Chemistry & Physics. In order to keep the degree programmes up to date curriculum revisions in the DPSc are made regularly. The last revision was made in 2005, and the feedback from experts in relevant fields from other universities, institutions, industries, and participants from the community, parents, graduated and current students are considered in the revisions.

Chemistry

As far as the subject content of Chemistry is concerned it covers almost all the basic topics in university level chemistry curriculum. Number of hours for lecturers and practical sessions are comparable with the time period allocated for chemistry in Physical Sciences Departments in other Sri Lankan universities. The theory and practical course units of the curriculum have been designed to cover the basic understanding on the fundamental concepts of Chemistry and to develop necessary skills in understanding the working of the apparatus and scientific instruments. The review panel properly understood the nature of various problems being faced by the department by offering five subjects from the same Department of Physical Sciences at present. Under this condition, the panel understood that the chemistry section of the department has no sufficient physical and human resources to start a special degree course in Chemistry. The students who did well in the general degree programme have been penalized under this situation.

Physics

Physics component of the 3 year degree programme comprises twenty six course units amounting to 34 compulsory and 11 optional credits that spread over three years. The same for B.Sc. (Joint Major) 4 year degree programmes in Biology & Physics and Chemistry & Physics comprises an additional seven course units amounting to 17 compulsory and 2 optional credits.

The theory course units of first and second years of the curriculum have been designed to provide students the basic understanding on the fundamental concepts of Physics. During these courses, students will develop skills in relevant applications with the ability of solving problems and to follow the other Physics course units offered thereafter. The laboratory course units offered at first and second years have been designed to develop systematic foundation of experimental work to gain necessary skills in understanding the working and the capabilities of the apparatus, handling scientific instruments, the inherent limitations of measurements, the manipulation of experimental techniques, use of computer for experiments, experience in data analysis and technical report writing. Out of 14 course units offered in the third year, only 3 of them are traditional Physics units. All the other units are in the areas of more applied and general nature, and they provide important links between several fields of Physics. Similarly, most of the fourth year courses are also from the more applied areas. Reviewers are of the opinion that the Physics course units offered by the DPSc have been designed to provide a good conceptual understanding of fundamental principles, together with the associated theories, in core and applied areas of Physics. In general, the Review Team is of the opinion that the design and the content of the Physics curriculum offered by the DPSc are adequate to achieve its outcomes. However, the reviewers observed



Click Here to upgrade to Unlimited Pages and Expanded Features s done in first and second years are low and no practical years except for the project. The DPSc may consider ts for the first and second years as well as to introduce

practical units for third and fourth years. When carrying out certain research projects or laboratory experiments with modern instruments background knowledge in Electronics is always useful. As such the Review Team recommends that the Electronics course unit be revised to a minimum of 3 credit course units.

<u>Mathematics</u>

DPSc offers courses in mathematics covering pure, applied, financial and industrial mathematics for FASc degree programmes in addition to the four year degree programme in Industrial Mathematics. Besides following few comments they were found to be aligned with mathematics course requirements agreed in the Sri Lankan university system. Availability of generic mathematics course units for non-physical science students is one of the strengths of programmes at DPSc. However, some such course units carry less credit weight than the subject content covering, e.g. CMP 1202 with all basic mathematics plus statistics with only for 2 credits. DPSc may consider splitting such broader course units into more focused several course units. There should be a consistency between offered credit values among all courses of specific subject in relation to the subject content discussed in each. The review team specifically like to recommend DPSc to consider the subject benchmark statement in Mathematics and Statistics that has been published by QAA Council in forth coming subject revisions.

Another confusion noted by the review team was course unit codes. DPSc has been adopted MAT, MAA and MAP for mathematics subject. Further different course units also deliver subject content of specific area. For instance, statistics related contents could be found inside, MAA as well as MAT course unit codes. DPSc could consider making a distinction course unit content also to reflect on relevant codes.

Computer Science and Information & Communication Technology

The immediate observation of the review team is, in both CS and ICT disciplines, there are strong sections covering fundamentals of CSs in the content. With the available limited human resources at the department, DPSc may easily consider offering much of the overlapping subject areas as common course units for both CS and ICT programmes under the prevailing conditions. For instance three Database related units; COM 1302, ICT 2406 and ICT 3401 could at least be considered merging into two units. Further, the review team was unable to locate any clear motivation for the introduction of ICT stream in parallel to existing CS stream. In this regard, team recommends the consultation of IEEE and ACM subject recommendation at the next CS and ICT review. (Please http://www.acm.org/education/curricula-recommendations). Another proposal that the review team would like to highlight here is possibilities of introducing more course units from Information Systems and Business Computing related areas together with the Faculty of Management Studies.

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



nent Methods

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ectus for students as booklet at the registration to follow degree programmes offered by the faculty. The Prospectus for students provides details of all degree programmes offered by FASc under two departments together with the academic plan for the whole programme, List of academic and other staff at FASc, List of all available courses together with pre-requisites to follow course units and other conditions, evaluation method and degree awarding criteria. The review team noted that availability of above information at the commencement of degree programmes of the DPSc in the Prospectus for students is a positive thing. Another noteworthy point is, being the centre for excellence in higher education, research, and dissemination of knowledge in north central province of Sri Lanka, FASc attracts students from all ethnic groups by conducting its study programmes in English at all levels. Besides the Prospectus for students, FASc also organizes orientation programme at the commencement of their degree programmes for enrolled students. The main focus of the orientation programme is to prepare students get the maximum benefits out of available academic and extracurricular services during their stay at Rajarata University. As all study programmes of DPSc are taught in English medium at all levels, a big fraction in the orientation programme is devoted to develop students English language skills to follow course units at FASc. This orientation programme is also one of the good practices found to the review team.

DPSc utilizes conventional lectures, practical classes, assignments and tutorials as the main mode of delivery content in the curriculum. During the meeting with academic staff, it was found that different staff members adapt different evaluation criteria by informing students at the beginning of the course units that they are responsible. This is source of confusion mainly for students who may join at the middle of a course and it was with the view of the review team that it is good to have generally agreed policy on student evaluation. For instance for which course units, studentsø attendance are to be counted and the percentage of its contribution to the final evaluation. During the reviewing process, team noted lecturersø motivation to interact with students although the students øresponses kept very low. It was also revealed that the availability of a Learning Management System (LMS) to get assistance for teaching and learning activities. However except few CS and ICT courses, LMS is not much utilized for courses. Faculty may consider arranging more staff development activities specially targeting junior staff members to develop their teaching skills as well as technologies such as LMS. In this context, the peer-observation that DPSc has already started could be one the very useful method to be continued regular basis. Most of the deficiencies that review team also noted such as legibility of presentation slides & writings on board, loudness of lecturer talk could be rectified immediately through peer-observations. It is also recommended to distribute handouts for the relevant lecture of course unit or at least could make them available for students through departmental web-server or through the LMS. However, during observations of lectures the review team could find adaptation of these above best practices at an acceptable scale.

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



ogress and Achievements

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of the RUSL on the basis of their achievements at the G.C.E. (A/L) Examination. Due to the high demand and the attraction for professionally oriented degree programmes such as Medicine and Engineering, usually students who secure low Z-scores at the G.C.E. (A/L) Examination will be selected for Science and Applied Sciences Faculties of the Sri Lankan Universities. Several meetings were conducted both with the students and their leaders of DPSc by the Review Team. In these meetings they have indicated their satisfaction with the programmes conducted by the DPSc. Also, they appreciated the support and the relationship provided by the DPSc staff. It has been observed that the majority of students are having good interpersonal, communication and leadership skills. Studentsø progress very much depends on the extent of their participation in the academic programmes. It was noted that although the attendance at practical classes, and first and second year lectures are high, the third year lecture attendance is very poor. The DPSc should come up with a mechanism to improve the third year lecture attendance too. However, according to the statistics provided by the DPSc for the last three academic years, there has been a continuous progress in the studentsøperformance at examinations except for one batch which they believe probably due to the re-location of the faculty at Mihintale. There is a good distribution of achievement levels (variation of classes and ordinary passes) at final examinations testifying the validity and fairness of the evaluation process. The failure rate of the recently graduated batch was around 12%.

Students expressed interest in following single subject 4 year degree programmes in Chemistry, Physics and Mathematics. As such the DPSc shall initiate actions towards this by designing suitable curriculum and commencement of such programmes as early as possible with at least few students to begin with. The department shall also motivate more students to follow already available 4 year degree programmes. These actions bring students to progress and achieve in-depth knowledge and skill including research in these subject disciplines. It was informed that the FASc has carried out a survey to ascertain the job profile of the past students and their unemployment rate is low. It is pleased to note that around 2/3 of the present academic support staff members of the DPSc are alumni of RUSL, However, detailed statistics regarding their performance and progress are not available.

In relation to the quality of students including 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 practical sessions, lecture & tutorial classes and at Faculty Board meetings where student representatives attend the meetings. The Department has perceived the importance of quantitative student feedback. The teaching process is evaluated by student feedback using a questionnaire since late 2008. The questionnaire includes feedback on several aspects of teaching & learning processes 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 yet not been analyzed to identify the strengths and weaknesses of each staff of the department. The outcome of the quantitative student feedback have also not been brought to the notice of all academic staff at departmental meetings.



trial visits. The Review Team recommends that the ck may be extended to all staff, visiting staff as well as ve collected for a lecturer to compare his/her scores over

the years on a particular course to evaluate the progress.

In relation to the extent and use of student feedback, qualitative and quantitative, the judgment of the team is SATISFACTORY

4.5. Postgraduate Studies

The DPSc has modest facilities for research leading to an MPhil degree although no one has registered yet. However, the student registered for the MPhil degree when the faculty was at Polgolla quit from the programme without completing. Discussions are in progress at RUSL for initiating a collaborative research programme with Charmers University, Sweden, and University of Peradeniya in Polymer Electrolytes. Already one of the Swedish students has completed the research component of her MSc programme at RUSL. Also, PGIS students following MSc in Material Physics programme are carrying out their research components at RUSL. Therefore, Reviewers believe that DPSc has the resources and the capability to start postgraduate studies. The Review Team also noted that the DPSc is about to start a Postgraduate Diploma programme in ICT.

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

4.6. Peer Observation

The DPSc has perceived the importance of peer evaluation and the review team was pleased to find evidence of peer evaluation of teaching by colleagues in their own department also has begun this year. As per the materials provided to the review team, many permanent staff members have been subjected to peer observation while teaching, by other members of the Department. The team also noted that the Senior Academic staff members are also being peer-evaluated. In addition, the temporary staff members are being monitored by senior academics. The peer observation is found to be a workable tool in the DPSc. It can be recommended that the peer observation data may be collected for few years to analyze the data collected and be correlated with the student feedback responses for further improving teaching, learning and assessment of lecturers concerned.

In relation to the peer observation, the judgment of the team is SATISFACTORY.

4.7. Skills Development

DPSc is conducting several activities for studentsø skill developments. Among them, priority has been given to studentsø English language requirement. Besides conducting all course units in English medium, DPSc together with FASc is conducting three months compulsory intensive course at the start of academic programmes for level I students. There is an on-going English language courses for students from all levels to improve their language and communication skills. FASc conducts an examination in order to group students according to their language proficiency for the compulsory English intensive course at the start. FASc has also recruited two instructors in English for language skill development programmes. There is a Career Guidance unit at the University with a director and coordinators for all faculties. In addition, evidences are found through document observation that DPSc and FASc conduct



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ogrammes covering wide spectrum of areas including Life, and Computer applications. Also the review team s to take part in different inter-university competitions.

Also the team noted availability of following units and centres at the Rajarata University of Sri Lanka providing different studentsøskill development services.

- Physical Education Unit
- Cultural Centre
- Medical Centre
- Computer Centre

Another positive aspect in studentsø skill development is industrial placement and studentsø mini projects that have been included in the curriculum. This is further to the compulsory non-credit course units such as Ethnic and Social Harmony, Management and Economics, Environment & Natural Resources of Sri Lanka, etc for developing inter-personal as well as transferable skills.

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

4.8. Academic Guidance and Counseling

The students entered to the FASc are well-guided with regard to academic matters by the academic staff of the DPSc. Students are provided with the Prospectus when they enrol at the FASc, which contains information about the course structures of various degree programs and their requirements to be fulfilled including detail syllabi of the course units. All academic related issues are handled by the HOD and the respective lecturers of the DPSc. In addition there are separate subject coordinators for subjects of ICT and Mathematics. The FASc has four Student Counsellors including the Senior Student Counsellor to guide students in academic and other counselling matters. The FASc also has a Career Guidance Coordinator under the Career Guidance Unit of the RUSL. The Career Guidance Unit organises workshops annually to develop the skills of their graduates for successful future careers.

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

Based on the observations made during the study visit by the review team, the eight aspects were judged as follows:

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



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weaknesses of each of the eight aspects considered in

the subject review process are summarized as follows.

1. Curriculum Design, Content and Review

Strengths/Good Practices:

- Curriculum revisions are carried out in regular basis. Last revision was done in 2005
- Availability of CS courses for all physical science students
- Availability of Mathematics courses for biological science students
- Availability of Physics courses for biological science students
- Availability of Physics courses in more applied and general nature
- Availability of basic courses on physical sciences
- Availability of three-months intensive course in English Language

Weaknesses:

- Course units covering wide spectrum of subjects topics for less credit value
- No pathway to single subject special degree in either chemistry, mathematics or physics
- Practical sessions mismatched with theory courses (eg. titration practical sessions conducted during first year are being dealt theory-wise during the second year)
- Absence of Industrial Training for all programmes
- Number of Physics practical exercises done in first and second years are low
- No Physics practical exercises in third and fourth years
- Contents of the Electronics course unit is not adequate

2. Teaching, Learning and Assessment Methods

Good Practices/ Strengths:

- Availability of Prospectus for students containing all information about academic programmes
- Industrial Trainings and Students Projects included within the curriculum
- Student attendance is counted for all practical and some theory course unit evaluation
- Lecture hall and laboratory facilities are adequate for the present programmes
- Adequate computer facilities are available
- Adequate library books and periodicals are available
- Question paper moderation and second marking of the answer script are in practice

Weaknesses:

- Continuous assessment evaluation criteria not consistent and changed by lecturer frequently
- Adaptation of varied evaluation methods for different course units
- Human and physical resources (Lecture hall, laboratory and equipment) are not adequate to commence single subject special degree in either chemistry, mathematics or physics
- Unavailability of handouts for some course units
- Majority of subject contents are delivered by junior academic staff with heavy workload
- Less staff development activities and peer-observations



ogress and Achievement

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Good passing rate of DPSc degree programmes

Weaknesses:

- Poor attendance in third year lectures
- Students have not shown interest in the available 4 year degree programmes
- No pathway for students to progress on single subject special degree in chemistry, mathematics or physics

4. Extent and Use of Student Feedback

Strengths/Good Practices:

- Practice of obtaining quantitative student feedback has commenced
- Practice of obtaining qualitative student feedback is in practice

Weaknesses:

- Quantitative student feedback data have not been properly analyzed
- Obtaining quantitative student feedback data not extended to practical sessions
- Obtaining quantitative student feedback data not extended to visiting academics

5. Postgraduate Studies

Strengths/Good Practices:

- Motivation of staff members to initiate postgraduate programmes
- Availability modest facilities for research leading to an MPhil degree
- Collaboration with other universities both local and foreign

Weaknesses:

- Postgraduate research programmes are not available
- No M.Sc. or postgraduate diploma programmes

6. Peer Observation

Strengths/Good Practices:

Practice of obtaining peer observation has just commenced

<u>Weaknesses</u>

• Obtaining peer observation has not yet extended to visiting academics

7. Skills Development

Strengths/Good Practices:

- Availability of wide spectrum of academic and extracurricular services
- The curriculum contains Industrial Training placements and Students Projects
- Compulsory/Optional course units that develop studentsø inter-personal and transferable skills.



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egion for industry collaborations

tsø subject societies

• Limited resources for extracurricular activities at the university (for instance for physical education activities)

8. Academic Guidance and Counseling

Strengths/Good Practices:

- Providing Prospectus to students at the beginning of their first year
- Availability subject coordinators for the subjects of ICT and Mathematics
- Availability of four Student Counsellors
- Organising workshops annually to develop the skills for a successful future career

Weaknesses:

- Non-availability of mechanism to assign Personal Tutor for each student
- Non-availability of an office for Student Counsellors and properly designed counselling hours
- Non-availability of Academic Advisors for each subject stream

6. RECOMMENDATIONS

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

- 1. Department may consider offering more focused mathematics course units for nonphysical science students
- 2. Consider consultation of IEEE and ACM recommendations at the next CS and ICT revisions (for instance, http://www.acm.org/education/curric_vols/CC2005-March06Final.pdf)
- 3. Design curriculum to commence single subject special degree in chemistry, mathematics or physics with at least few number of students at the beginning
- 4. Curriculum revision is required incorporating new applied areas of Chemistry
- 5. Increase the number of Physics experiments for the first and second years
- 6. Introduce Physics practical units for third and fourth years
- 7. Electronics course unit to be revised to a minimum of 3 credit course
- 8. Introduce a Case Study to the Research Project of the Industrial Mathematics programme
- 9. DPSc may consider more staff development activities and regular peer-observations targeting mainly junior academic staff
- 10. Technologies such as Learning Management System could be utilized within teaching and learning processes
- 11. Continuous assessment evaluation criteria shall be made more consistent
- 12. Senior academics shall be engaged to deliver important section of lecture series
- 13. Motivate more students to follow third year lectures
- 14. Consider introducing more in-class assessments in the third year Introduce presentations to the practical components



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ial degree programmes in chemistry, mathematics and or deserving students to progress further w available 4 year degree programmes

- 17. Quantitative student feedback data need to be analyzed in the near future
- 18. Obtaining quantitative student feedback data need to be extended to practical sessions as well
- 19. Obtaining quantitative student feedback data may to be extended to visiting academics as well
- 20. Findings of the student feedback practice may be discussed at staff meetings
- 21. Introduce postgraduate research programmes
- 22. Introduce collaborative research programmes
- 23. Introduce M.Sc. and postgraduate diploma programmes
- 24. Obtaining peer observation may be extended to visiting academics
- 25. Peer observation data has to be correlated with the student feedback responses for staff development programme of the lecturer concerned
- 26. Findings of the peer observation practice may be discussed at staff meetings
- 27. DPSc could support formation of studentøs subject and other societies
- 28. Introduce some chemistry experiments that involved the application of computer knowledge
- 29. Design and implement a Counselling Office
- 30. Assign Personal Tutor for each student
- 31. Appoint Academic Advisors for each subject stream
- 32. Appoint subject coordinators for the subjects of Chemistry, CS and Physics

Acknowledgements

The Review Team appreciates the excellent working arrangement made by the DPSc during the review visit. The HOD and all others in the dept. provided the necessary support to perform our duty well. The documents were displayed and any other document needed by the team member, it was provided by the staff. The review team is grateful to all the categories of the staff in the DPSc and others for the support given during our visit.



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VIEW VISIT

Day 1: 12th October 2009

- 08.30 09.00 Meeting of review panel with QAA council representatives
- 09.00 09.15 Discuss the agenda for the visit
- 09.15 10.15 Meeting with Vice Chancellor, Chairman/Internal QA unit, Dean, Head of the Department, Faculty QA cell
- 10.15 10.30 Tea
- 10.30 11.30 Presentation on the self evaluation report
- 11.30 12.30 Discussion
- 12.30 13.30 Lunch
- 13.30 15.30 Observing facilities (Laboratories and Library)
- 15.30 16.30 Meeting with Academic staff (working tea)
- 16.30 17.30 Meeting with undergraduate students
- 17.30 18.30 Brief meeting of reviewers

Day 2: 13th October 2009

09.00 - 09.30	Observing teaching - Lecture (2nd year ó PHY 2204 - Physical Optics)
09.30 - 10.00	Observing teaching - Lecture (1st year 6 ICT 1305 or CHE 1203)
10.00 - 10.30	Meeting with student Counsellors
10.30 - 11.30	Observing documents (working tea)
11.30 - 12.30	Meeting with technical staff and other non academic staff
12.30 - 13.30	Lunch
13.30 - 14.00	Observing teaching - Lecture (1st year ó MAP 1201) 14.00 - 15.00
	Meeting with postgraduate students
15.00 - 15.30	Observing teaching - Practical class (CHE practical/COM practical)
15.30 - 16.00	Tea
16.00 - 16.30	Meeting with staff members (different disciplines) 16.30 - 17.00 Meeting
	of reviewers

Day 3: 14th October 2009

- 09.00 09.30 Observing teaching Practical class (1st year ó PHY practicals)
- 09.30 10.30 Observing documents (working Tea)
- 10.30 11.00 Reviewersø private discussion
- 11.00 12.00 Meeting with Head and Staff for reporting
- 12.30 13.30 Lunch
- 13.00 17.00 Report writing



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> Dean of the faculty, Head/DPSc & senior and junior academic staff members, Director, Quality Assurance Unit Director, CICT Director, Staff Development Centre Coordinator of the English Language Teaching Unit, Career Guidance Coordinator, Director/Physical Education, Chief Student Counsellor & Students Counsellors, Librarian of the FASc Demonstrators & passed out students Postgraduate students Non-academic staff members, Students from the first, second, third and final years.

Annex 3. DOCUMENTS PERUSED BY THE REVIEW TEAM

- 1. A/L Workshops
- 2. Cadre
- 3. Career Guidance (Workshops/Training Programmes)
- 4. C-Forms
- 5. Convocation
- 6. Correspondence (with other Universities and Institutes)
- 7. Curriculum Revision
- 8. CVøs Visiting Lecturers
- 9. Department Meetings
- 10. Equipment and Consumables
- 11. ICT Consultant (Dr. Gamini Wijeratne)
- 12. Industrial Training
- 13. Joint Major (Chemistry/Physics)
- 14. Lecturers in Charge
- 15. Miscellaneous
- 16. Moderated Papers
- 17. Network/Internet policy
- 18. New External Degree Programmes
- 19. Non Academic Matters
- 20. Notices
- 21. Panel Member and Meetings
- 22. Peer Observation
- 23. Permanent Academic Staff
- 24. Permanent Interviews
- 25. Permanent Staff (Postgraduate)
- 26. Postgraduate Studies & Research
- 27. Question Papers 1st year
- 28. Question Papers 2nd Year
- 29. Question Papers 3rd Year
- 30. Question Papers 4th Year
- 31. Recommendations
- 32. Salaries of Staff
- 33. Student GPA
- 34. Student Matters



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- 38. Temporary Academic matters
- 39. Temporary Appointments
- 40. Temporary Appointments (Extensions)
- 41. Time tables
- 42. UGC Newsletters
- 43. Undergraduate Research Projects
- 44. University Act
- 45. University Grants Commission
- 46. University Guest House Reservations
- 47. Visiting Appointments
- 48. Visiting Appointments (On Assignment basis)
- 49. Walk in Interviews

Annex 4. FACILITIES

Dean office Staff rooms Laboratories (Chemistry, CS, ICT and Physics) Equipment rooms (Chemistry and CS) Dark rooms of Physics Lecture halls (Chemistry, CS, ICT and Physics) Auditorium Faculty library