SUBJECT REVIEW REPORT

DEPARTMENT OF ELECTRONICS

FACULTY OF APPLIED SCIENCES
WAYAMBA UNIVERSITY OF SRI LANKA

24th to 26th May 2006

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1. PURPOSES AND AIMS OF THE SUBJECT REVIEW

Subject review process formulated by the University Grants Commission evaluates quality of education within a specific subject or discipline. It is focused on the quality of the student learning experience and on student achievement. It has been designed to evaluate the quality of both undergraduate and postgraduate programmes offered by academic departments of the Sri Lankan Universities.

This report describes the outcome of a review carried out to evaluate the quality of the academic programmes and related issues in the Department of Electronics of the Faculty of Applied Science of the Wayamba University of Sri Lanka during the period from mid 1999 to mid 2006. In this exercise the following aspects were examined and evaluated.

1. Curriculum Design, Content and Review
2. Teaching, Learning and Assessment Methods
3. Quality of Students, Student Progress and Achievements
4. The Extent and Use of Student Feedback
5. Postgraduate Studies
6. Peer Observations
7. Skills Development
8. Academic Guidance and Counselling

2. BRIEF HISTORY AND THE CURRENT STATUS OF THE UNIVERSITY AND THE DEPARTMENT

The Wayamba Campus of the Rajarata University of Sri Lanka served as the forerunner to the Wayamba University of Sri Lanka (WUSL). In 1999, Wayamba Campus was upgraded to a fully-fledged University.

The newly established Universities were expected to focus on the future needs of the country especially in relation to human resources with necessary competence and skill to meet the development needs. The Wayamba University was expected to develop new degree programmes with appropriate courses, adopt modern technology, teaching/learning techniques and evaluation procedures. The emphasis has been to make best use of investment on higher education to produce employable graduates to meet the needs of the sectors, which are in big demand.

'To achieve excellence in Higher Education, Research and Technology, Training and developing human resources to meet national and global needs', is the vision of the Wayamba University of Sri Lanka. Its mission is to 'develop innovative, skilled, trained manpower and their capabilities to fulfil national and global needs through undergraduate and postgraduate education, research and outreach programme'.

Organizational Structure

At present the WUSL has four faculties, namely Faculty of Agriculture & Plantation Management, Faculty of Livestock, Fisheries & Nutrition, Faculty of Applied Sciences, and Faculty of Business Studies & Finance. In those four faculties, there are 16 Departments covering a wide range of subject areas. University is situated in two premises namely Kuliyapitiya and Makandura which are 23 km apart. Due to this, there is a repetition of facilities such as Computer Centers, Libraries, and Play grounds. The WUSL also has 6 medium size hostels, 4 in Kuliyapitiya and 2 in Makandura for student accommodation.

Faculty of Applied Sciences (FAS)

The Faculty of Applied Sciences was in existence even before the establishment of WUSL, as a campus called 'Wayamba Campus of Rajarata University' with only three Departments namely, Mathematical Sciences, Industrial Management and Computer Science, and Applied Nutrition.

Later in 1999 when WUSL was formed, five Departments were attached to the Faculty, but one was later transfered to another faculty. FAS now consists of four departments; Department of Electronics, Department of Computing and Information Systems, Department of Industrial Management and Department of Mathematical Sciences. With the four Departments, the Faculty has developed its vision and mission in align with the University vision and mission and also considering the national demands.

VISION OF THE FACULTY

TO BECOME A CENTRE OF EXCELLENCE FOR DEVELOPING HUMAN RESOURCES IN HIGHER EDUCATION, RESEARCH AND TECHNOLOGY TO MATCH THE NATIONAL AND GLOBAL TRENDS.

MISSION OF THE FACULTY

TO PRODUCE COMPETANT, INNOVATIVE HUMAN RESOURCES TO MATCH THE NATIONAL AND GLOBAL TRENDS THROUGH UNDERGRADUATE AND POSTGRADUATE EDUCATION, RESEARCH AND OUTREACH PROGRAMMES.

Until year 2002, faculty offered a B.Sc. General Degree of 3 year duration. From the year 2003, a four year Degree programme (B.Sc. Joint Major) including a 6 month industrial training was introduced with the aim of producing competent graduates with proper attitudes and values, who are readily employable in manufacturing and service industries through competence based education. The medium of instruction of the faculty is English which enables the faculty to attract students from three major communities. The annual student intake is about hundred students and the total student population is about four hundred students. FAS is the second largest faculty in the University as far as the student numbers are considered.

Department of Electronics

VISION OF THE DEPARTMENT:

TO BECOME A CENTRE OF EXCELLENCE FOR THE DEVELOPMENT OF HUMAN RESOURCES IN THE FIELD OF ELECTRONICS TO MATCH THE NATIONAL AND GLOBAL TRENDS

MISSION OF THE DEPARTMENT:

THE DEPARTMENT INTENDS TO CONTRIBUTE TO THE DEVELOPMENT OF THE ELECTRONICS AND ITS RELATED FIELDS BY PRODUCING QUALITY GRADUATES WHO ARE WELL VERSED WITH THEORETICAL KNOWLEDGE AND PRACTICAL SKILLS.

The Department of Electronics is the youngest among the four departments in the FAS and it was initiated in the year 2000. At present, the Department is housed in a small building with space for the office and for a laboratory with the capacity of 30 students. The Department started offering Electronics as a main subject from the academic year of 2001/2002.

Department offers basic courses on Electronics common for the first year students in the FAS. Second year onwards students select their major areas and those who follow Electronics as a subject will be given set wise course structure up to the fourth year. In the fourth year, they will be sent to industry to get an industrial management exposure. Furthermore they are given a project work related to Electronics in the same year. At the end they will be provided with the knowledge and the skills that market demands from a non-engineering graduate.

As for lecture theatre facilities, the department has access to FAS facilities of one main hall, which can accommodate about 200 students, and five small lecture rooms, which can accommodate about 50 students each. The Department of Electronics has only one laboratory that is being used to conduct practical classes for all levels of the General Degree programme and it can accommodate only up to 30 students. The department has in its possession sufficient number of basic electronic test equipment such as oscilloscopes, multimeters, function generators, and adequate supply of basic IC^{s} (Integrated Circuits) and other accessories to perform standard set experiments in electronics. They also have 5 -10 computers available to perform electronic experiments.

The Library, which is situated in the near proximity of the Electronics Building, has a reasonable number of electronics and electricity text books. However, there is a dearth of journals and sufficient number of copies of popular text books.

The FAS has separate computer facilities including the internet access to students and the staff.

There are three Senior Lecturers and three Probationary Lecturers in the Department. Prof. C.A.N. Fernando from the University of Ruhuna is presently serving in the department on sabbatical leave. One probationer is on overseas postgraduate study leave and the other two probationers are pursuing postgraduate studies locally. There are six Temporary Demonstrators in the Department recruited under Dean's cadre. Department has one Technical Officer, one Laboratory Attendant and one Labourer. However, the review team noticed that there are no official cadre positions for the Temporary Demonstrators and Laboratory Attendants. We strongly feel that this should be rectified by creating cadre positions for Temporary Demonstrators and Laboratory Attendants in the **department cadre itself** as electronics is practically oriented subject.

3. AIMS AND THE LEARNING OUTCOMES PROVIDED BY THE DEPARTMENT

3.1 Aims

The Department of Electronics conducts its academic programme with the aim of providing an education that will facilitate graduates who are not only knowledgeable and skilful but also confident, enterprising and well versed in communication skills.

As such the **Aims** of the Department of Electronics are to:

* provide a range of learning opportunities within the modular system of the university, which enables students to develop their academic knowledge and interest in Electronics.
* provide opportunities for students to develop skills and enthusiasm required for self-learning and life long learning.
* provide a friendly and supportive environment, which is conducive to enthusiastic learning and developing skills.
* encourage students to develop knowledge and understanding on the new theories and inventions.

* support the teaching staff in their career development including provision of feedback and peer advice and provide opportunities for effective teaching, learning and quality assurance.

3.2 Learning Outcomes

On the successful completion of the course modules offered by the Department of Electronics, the students should have:

* gained knowledge and conceptual understanding in various areas of electronics.
* acquired the ability to apply the knowledge gained to practical aspects.
* acquired the skill of self learning and life long learning.
* ability to acquire knowledge using effective learning skills, to undertake self-directed learning and to recognize their own strengths and weaknesses in learning.
* developed a range of personal and transferable skills such as the ability to analytical thinking and obtain logical conclusions and teamwork.
* a clear understanding of scientific methods.

  As a whole, the expected outcome is that students should be able to demonstrate their knowledge where ever applicable.

To help achieving the objectives listed above, the Degree programme offers a learning exercise that is intended to enable students to:

* benefit from a curriculum in which the design and teaching are enhanced by the collective effort of staff, students and other University services.
* have a manageable workload.
* have a clear idea of the academic programme, content, unit objectives and assessment methods in the form of Course Information Plan.
* build upon their academic qualifications by developing knowledge, skills and understanding based on a multidisciplinary approach.
* get practical exposure for almost all the course modules.
* provide continuous assessments and feedback for individual progress.
* provide with latest technology including IT in the teaching.

On successful completion of the each of the following programmes, students should have achieved the following specific objectives.

1. **B.Sc. (General) Degree with electronics as a main subject:** Knowledge and understanding of fundamental principles in the areas of general physics, electricity and magnetism, basic electronics, analogue and digital electronics, semiconductor devices, signal processing and data acquisition, microprocessors and microcomputers.

2. **B.Sc. Joint Major:** Knowledge and understanding of the above topics at the general degree level and some advanced topics in electronics including advanced solid state devices.

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

4.1.1 Curriculum Design:

Department of Electronics conducts courses for both General and Joint Major Degree Programmes. Electronics component of the General Degree Programme comprises twelve course units spread over three years. The Joint Major Degree curriculum comprises all the General Degree units and additional fourteen more units which cater for in depth understanding of electronics.

Students who do not offer electronics as a main subject are also given an opportunity of offering two optional course units in electronics in each of the three years.

4.1.2 Content:

Electronics curriculum has been design to meet the requirements of the new technology based industry. Originally this curricular was designed with the help of some local universities. In the curriculum design it has been also assumed that students entering the university have widely varying levels of Physics knowledge and as a remedial measure an attempt has been made to bring all of them to the same level by offering units that provide broad introduction to fundamental topics in electricity and electronics. Basic electronics, general physics, together with practical electrical/electronics are units offered at the first year level. Practical units have been

designed to apply theory into practice and use of basic electric and magnetic measuring instruments. At the end of the first year students have the option to select either Major I or Major II.

In the second and third years students in both streams are being introduced to more advanced units in electronics and allied subjects namely electricity and magnetism, semiconductor devices, analogue electronics, digital electronics, signal processing and data acquisition, introduction to microprocessor and microcomputer technology. All these theory modules are supplemented with practical modules. At the end of the third year, students have the option to take the general degree or to proceed to level four of the Major I or Major II. Under Major I they follow a lecture course on communication theory, and undertake a research project, whereas the courses offered by the Major II students are programmable logic devices, fabrication of semiconductor materials and devices, and communication systems, which become the optional courses for Major I students. A substantial part of the fourth year of study is devoted to industrial training. For students majoring electronics, the industrial training is assigned in an area related to management.

However, reviewers feel that a reorganization of certain course units (for example ELTN3252, ELTN3233,) is necessary to stream line the contents, avoid repetition, and to introduce more depth to the contents (for example ELTN 2253, ELTN 3133). In addition, the introduction of certain topics such as feedback, sensors and transducers, analogue data acquisition techniques, and a course unit on power electronics (for example ELTN 3252) would be desirable. It is also advantageous to strengthen the analytical ability of students by introducing a course on circuit analysis. Regarding electronic laboratory work, reviewers feel that more exercises on device applications including automation are needed to be introduced to expose students to real world problems. In order to accomplish this, the duration of practical classes is needed to be increased at least from the third year.

4.1.3. Review:

Curriculum of the Electronics Department has been revised on two occasions since its inception in 1999. Faculty under Rajarata University offered a three year degree. When the Faculty was transferred to Wayamba University of Sri Lanka, curriculum was revised in the year 2000. Again there was a major revision in 2002 to introduce four year Degree programmes. An interim syllabus was offered to students

who were at 2nd and 3rd year at that time and students were opted to follow the four year Degree. In the fourth year, students who are following electronics as Major I are given a project work related to Electronics in the same year. Furthermore students are sent to industry for 6 months to get the industrial management exposure. However the reviewers strongly feel that the students should undergo industrial training in electronics related industry for them to develop skills in particular subject area. In addition to this a compulsory course on communication theory and a few more optional courses have been introduced in the fourth year.

Department of Electronics has recognized need of curriculum revision regularly and has made some effort to improve its curriculum. As such, reviewers observe that the curriculum design content and review aspect in the department is good. Major curriculum revisions, however, be implemented with much caution as frequent major changes in syllabuses and formats may cause confusion among batches of students. Reviewers feel that in future curriculum revisions it is desirable to consider the possibility of implementing the suggestions given under 4.1.2, and also add some practical units in the first year (first semester) as stated under recommendations.

Based on the above observations reviewers conclude that Curriculum Design, Content and Review is ***good*** in this Department

4.2. Teaching, Learning and Assessment Methods

4.2.1 Strategy

Department of Electronics offers courses in all four years of the B.Sc. Degree program. In the first year the Department offers some pre-requisites for the Basic Electronics for all the students. In the next three years, Department offers courses for the students who select Electronics as their major subject.

4.2.2 Teaching and Learning Activities

The range of teaching and learning activities and assessment methods practised by the Department are appropriate to the development of necessary knowledge and skills in both theoretical and practical aspects of subject areas. This enables the graduates in meeting the objectives of the Faculty of Applied Sciences as outlined in the prospectus.

All courses are taught through a combination of lectures, practical classes and tutorials. At the beginning of each course module students are provided with a Course Information Plan (CIP) where all information about the course module such as course contents, number of credits that can be earned, evaluation process and suggested references are given to students. The staff is encouraged to use modern educational aids. Handouts are distributed to students to provide them with an additional knowledge and support on the facts they learn in the class.

Practical classes have the primary aim of allowing students to learn experimental methods and transferable skills, and also reinforce and extend subject specific knowledge and the translation of theory into practice. Each student is given a complete handout for each practical which includes a list of apparatus, theory, diagrams of practical set up, guidelines on how to carry out the experiment, etc. During the practical sessions, the students are expected to work in groups and special emphasis is given to promote staff-student interaction. There are differences in the style of the practical among different courses, reflecting their different objectives. In addition students are given an opportunity to get some experience of performing computer based practicals. At the end of the practical class each student submits an assignment or writes up to consolidate learning and to check progress. This is considered as a part of their continuous assessment.

In laboratory work it is important to provide opportunities for students to work independently, test new techniques, and practice the theories learnt in the lectures at least at the final year. Reviewers feel that such practices should be encouraged by providing students with necessary facilities and guidance.

According to the department, the fourth year research project (throughout the year) and the fourth year Industrial training (6 months) are specifically designed for improving the students' problem solving skills, and management cum leadership qualities. These courses not only build up students' confidence in self-learning, putting theory into practice, and the development of intellectual independence, but provide opportunity of establishing contacts with the professionals of their relevant fields. Reviewers, however, strongly feel that students majoring electronics should be given an industrial **training in an area related to electronics,** and allow them to obtain all the necessary management and other skills mentioned above in conjunction with that training. The fourth year research project also enables students to obtain

experience in research and encourages initiative, self-reliance and originality. The department at present conducts the research project in groups (of 3 students). The best way to provide research training at undergraduate level is, however, to assign projects individually. When handling large projects the same concept can be followed by assigning an each member of a group of students to study different aspects of the project. In such exercises it is important to assess the performance of students at individual bases.

Since the Department has poor facilities for advanced practical modules some course modules are still evaluated by self study and by an oral presentation of a specific topic provided by the Department.

For each and every course module including tutorial sessions, a complete set of day to day record is maintained at the Department in all semesters by the corresponding lecturer and tutor. This helps to obtain an idea about the flow of the content of a course module, amount of coverage of sections in a particular semester etc. Also, at the end of each semester, the entire lecture notes, tutorial and practical handouts with answers and marking schemes are collected and kept in the Department. Since the medium of instruction is English, all materials are prepared in English.

4.2.3 Assessment Methods

Examinations are considered as an efficient way of measuring academic achievements. Two examinations are conducted for each course module as Mid Semester Examination and End Semester Examination. During the lectures, small quizzes are also given. Simultaneous tutorial sessions are being conducted for each course module. For the final grade, performances in Mid Semester Examination, Tutorial sessions, quizzes and End-semester examination are considered. Number of questions in the end semester examination depends on the number of units (credits) of the module. As an example, for a 2 credit course, student has the option of selecting 4 questions out of 6 and the time duration is 2 hours.

Practical modules have been designed in such a way that every student should submit an individual report for every experiment he or she has done. Marks obtained for those continuous assessments carry 50% by weightage of the final grade for practicals. The rest is considered from the end semester examination. In examinations, students perform under time limitation, and without supporting materials.

All the question papers are moderated by another academic member in the Department who would also function as the second examiner. For some course modules, second marking of answer scripts is done by outside experts. However, cconsidering the difficulties of having staff members with different expertise in the subject within the department in a new University, the reviewers believe that it would be appropriate if all the end semester theory papers are moderated by outside experts and also getting the second marking by outside experts. Involvements of external experts in this manner would definitely lead to improvements of academic standards and in recognition of degrees offered by the WUSL.

The total marks for each course unit will be calculated and converted to a percentage. A grade and a Grade Point are awarded for each module. On completion of all semester examinations, a Grade Point Average (GPA) is calculated as the weighted average of Grade Points of all the modules.

However, it is noted that allocating grades (A^+, A, A^-, ... etc.) is done in a similar manner as in the old grading system. This is not satisfactory and allocating grades and grade points should be accordance with the proposed UGC document on course unit evaluation.

One of the grievances heard by the panel of reviewers at discussions with students is the delay that is being occurred in the releasing of examination results. When the releasing of results gets delayed, students find it difficult to plan their future studies, and in the case of final examinations, the delay may lead to loss of opportunities for WUSL graduates in a highly limited job market. Reviewers feel that the department together with the faculty should take measures to develop mechanisms to speed up the releasing of results.

Based on the above observations reviewers conclude that Teaching, Learning and Assessment Methods in the Department is ***good.***

4.3 Quality of Students, Student Progress and Achievements

4.3.1 Student Profile

Students gain admission to the Faculty of Applied Sciences, Wayamba University of Sri Lanka (WUSL) after passing General Certificate of Education

(Advance Level). Students who offer, Chemistry, Physics and Combined Mathematics and reach the required standards are eligible to enter the Faculty. FAS does not have a control over the quality of students admitted as it is the University Grants Commission that processes the applications and select the students for Science Faculties of Universities in Sri Lanka. The general trend is that students choose Faculties of Science of Peradeniya, Colombo, Sri Jayawardanepura, Kelaniya, Ruhuna Universities as their first choices. Only a few students select FAS, WUSL as their first option. This may be due to lack of popularity of FAS, WUSL among Sri Lankan Students.

4.3.2 Admission of Students / Orientation

New students are expected to register at the University before the inauguration of the Degree programme. On the day of inauguration, an orientation programme is arranged for students. During the orientation all students are given the student hand book, course curriculum and by-laws.

A placement test is conducted to group the students according to their English knowledge. An intensive course in English is conducted by the English Language Teaching Unit (ELTU) and duration of this course was earlier 3 months and it has been shortened to one month from the last year. It is conducted before the commencement of the academic activities of the first semester. This course is important since English knowledge of majority of new students is generally weak.

Parallel to this intensive course, one month course on Fundamental Computer Awareness is conducted by the Computer Unit for all new students. During the discussions reviewers had with students it was noted that some of them are not familiar with the rules and regulations pertaining to evaluation of courses offered by the department. However, it is learnt that the department explains such rules and regulations at the inauguration, but it would be better if it is supplemented with a small booklet giving those important information for future reference.

4.3.3 Progress and completion of Degree

Progress of the students is monitored by mid semester and end of semester examinations. Students are free to meet the respective lecturers to discuss their problems. Counselling service also offers help and guidance to solve academic and personal problems of students.

Until 2001, there were no students majoring in Electronics and course modules offered by the Department were optional subjects for the undergraduates.

4.3.4 Student Achievements

Department has not carried out any formal surveys to ascertain the job-profile of the past students because department will be able to monitor student achievement only after 2006.

The reviewers are of the opinion that the Quality of Students, Student Progress and Achievements are ***good.***

4.4 Extent and use of Student Feedback

The quality of teaching and learning is monitored by the feedback from the students obtained through the questionnaire given to the students. This procedure was commenced in 2002. In future, during each semester the department staff is intended to carry out two teacher evaluations, a mid and an end semester evaluations.

Reviewers are glad to note that the Department has realized the importance of formally obtaining the feedback from the students.

Therefore the Department deserves a ***good*** grade for the student feedback aspect.

4.5 Postgraduate Studies

The Department has so far not initiated any postgraduate programes for students. This is mainly due to lack of facilities such as lab space and equipment and also not having sufficient number of senior staff members. It is also noted that the intention of the Department is to first build up a quality undergraduate programme and thereafter step into postgraduate studies. The senior staff too has not involved in research prgrammes, may be due to the same reasons stated above. However, reviewers are happy to note that two probationary lecturers are pursuing postgraduate research in electronics locally in collaboration with other local universities. Reviewers feel that this would be an ideal opportunity for senior staff to get involved in such activities and develop a postgraduate research program in those fields.

Considering the difficulties encountered by a new University in general and the Department in particular, the reviewers feel that the Department has made some effort with regard to postgraduate studies.

As such reviewers grade this aspect as ***satisfactory.***

4.6 Peer Observation

There is no system of evaluating teaching of individual staff members by another staff member who is competent in the specific field of study. However, staff members informally discuss the problems arising during academic activities with their colleagues and the Head of the Department.

Considering the above, the reviewers are of the opinion that this aspect is ***satisfactory.***

4.7 Skills Development

Student skills development is one of the main aims of the curriculum design and in the learning, teaching and assessment methods used by the department.

Use of multimedia, computers and models in teaching help the students to gather knowledge efficiently. During the laboratory classes students gain the skill to design and carry out experiments, collect, analyze and interpret data report writing and present results.

In view of the above skills development aspect has been graded ***satisfactory.***

4.8 Academic Guidance and Counselling

Help and guidance is readily available to the student from the staff. Furthermore students are assigned to different student counsellors on the first day of arrival. For senior students too, the student counsellors are assigned during each academic year. Female as well as male senior staff members are appointed as counsellors. Faculty counsellors who are introduced at the orientation are freely available for students to discuss their problems.

During the orientation programme, first year students are given a thorough knowledge about various activities / functions in the university. Some social events are organized at faculty level to build close student-staff relationship.

The activities organized by the Faculty and the career guidance unit help students to adjust to the university and it's surrounding.

Students who need special guidance on personal problems are encouraged to meet senior student counsellors who may direct them to other professional bodies depending on the need.

As such the Academic Guidance and Counseling of the Department is ***good.***

5. CONCLUSIONS

Aspect Reviewed	Judgment Given
Curriculum Design, Content and Review	Good
Teaching, Learning and Assessment Methods	Good
Quality of Students, Student Progress and Achievements	Good
Extent and use of Student Feedback	Good
Postgraduate Studies	Satisfactory
Peer Observations	Satisfactory
Skills Development	Satisfactory
Academic Guidance and Counselling	Good

6. RECOMMENDATIONS

Based on observations made during this review we wish to make the following recommendations.

1. Reviewers are happy to see that the academic as well as the non academic staff members of the Department are enthusiastic in developing the department and are trying to maintain good work habits. However, in order to improve the overall academic standards of the department we recommend the members of the department to upgrade their knowledge in electronics as this subject is expanding rapidly with the developments of new technologies.
2. We noted that the release of examination results is getting very long delays and it is recommended that immediate action be taken to rectify this problem.

   Regarding moderation and second marking, the reviewers suggest that it would be appropriate if all the end semester theory papers are moderated by outside experts and also if possible getting the second marking done by the same experts. This suggestion is made after considering the difficulties of having staff members with different expertise within the subject in the

department of a new University, and the need to obtain outside recognition to WUSL degrees.

3. We realized that students do not have a clear idea about the faculty requirements pertaining to examinations. We request the department to clarify such points to students by providing a small booklet containing such points at the beginning of the academic year.

4. The review team noticed that there are no official cadre positions for the Temporary Demonstrators and Laboratory Attendants in the Department of Electronics. We strongly recommend that this should be rectified by allocating official cadre positions for Temporary Demonstrators and Laboratory Attendants as electronics is basically a practically oriented subject.

5. Rreviewers recommend that a reorganization of certain course units (for example ELTN3252, ELTN3233,) is necessary to stream line the contents, avoid repetition, and to introduce more depth to the contents (for example ELTN 2253, ELTN 3133). In addition, the inclusion of certain topics such as feedback, sensors and transducers, analogue data acquisition techniques, and a course unit on power electronics (for example ELTN 3252) are desirable. It is also recommended to introduce a course on circuit analysis in order to strengthen the analytical ability of students. As for electronic laboratory, reviewers feel that more exercises on device applications including automation are needed to be introduced to expose students to real world problems. In order to accomplish such ideas, the duration of practical classes is needed to be increased at least from the third year.

   Regarding the research project the reviewers recommend that students should be provided with the opportunity to carry out the research project individually.

   Regarding the industrial training the reviewers strongly feel that the students should undergo industrial training in electronics related industry for them to develop skills in particular subject area rather than in a management area.

6 We are happy to note that two probationary lecturers are doing postgraduate research in electronics locally. However, it would be better if these young lecturers can get some opportunity to work in advanced

laboratories in developed countries. Therefore it is recommended that they be provided with such opportunities in the near future.

7. Reviewers would like to stress the need of initiating research activities by the senior staff as it will not only improve their carrier development, but also helps to find solutions to problems faced by the country. As a first step in this direction, we would urge the senior staff to get involved in the research projects that is being done by their younger colleagues and transform them to strong research programmes.

8. To further improve teaching and learning process it is recommended that better laboratory facilities be provided. Particularly, number of available laboratories in the department should be increased.