SUBJECT REVIEW REPORT

DEPARTMENT OF CHEMICAL AND PROCESS ENGINEERING

FACULTY OF ENGINEERING
UNIVERSITY OF MORATUWA

04th to 6th May 2005

Review Team :
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CONTENTS

1. SUBJECT REVIEW PROCESS

Subject review process of the UGC involves evaluating the quality of education within a specific subject or discipline, focusing on the student learning experience and on student achievement. This subject review process evaluates the quality of both undergraduate and taught postgraduate programs. It is understood that the final responsibility for quality and standards remains within the institution itself, since it alone has the powers to control and to change existing practices.

Subject review process at the Department of Chemical & Process Engineering (DCPE) of University of Moratuwa was conducted following the guidelines provided in the Quality Assurance Handbook for Sri Lankan Universities, published by the CVCD and University Grants Commission in July 2002. The quality of education was reviewed according to the aims and learning outcomes given in the self-evaluation report.

The following eight aspects of education were reviewed at the Departmental level:

- Curriculum design, content and review;
- Teaching, learning and assessment methods;
- Quality of students including student progress and achievements;
- Extent and use of student feedback (both qualitative and quantitative);
- Postgraduate studies;
- Peer observations;
- Skills development;
- Academic guidance and counseling.

The review team visited the department for three days, namely 4th, 5th and 6th May 2005. The agenda of the three-day visit is given in Annex 1. The information related to the above eight aspects were collected by having discussions with the Dean, Head of the Department, members of the academic and non-academic staff, a group of undergraduate and postgraduate students (see Annex 2 for persons attending), by peer observation of the teaching process (see Annex 3), by observing the facilities at the Department (see Annex 4) and by examining the documents provided by the Department (see Annex 5).

Each of the eight aspects was judged as good/satisfactory/unsatisfactory, noting the strengths, good practices and weaknesses in each. Considering the judgment of the eight aspects, an overall judgment is reported at the end of this report selecting one of the three options; confidence/limited confidence/no confidence; in the academic program.

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

History of the University of Moratuwa dates back to 1972. The technical college that had existed in this location has later been converted to a degree awarding institute. Department of Chemical Engineering was inaugurated by gazette notification on 15th February 1972 and the first intake was registered in the same year. The course was originally termed Chemical Engineering and Fuel Science and the degree awarded had been Bachelor of Applied Science (B.A.Sc). Since 1980 the degree awarded is Bachelor of Science in Engineering.

The vision of the Department is to *deliver Chemical and Process Engineering knowledge, skills and innovation for a sustainable tomorrow* and its mission is to strive to educate, conduct research and offer consulting services with dedication, devotion and commitment and aim to be a place of excellence through internationally recognized programs for the benefit of the society.

Current annual intake of the Faculty of Engineering is about 600 students and they follow a common course during the level 1 study. From level 2, students specialize in Chemical and Process Engineering (CPE) and the current intake to the department is 50. Further the department offers three postgraduate taught course and postgraduate research degrees.

At present (2005 May) there are fourteen Academic Cadre positions, nine positions for Technical Officers, five positions for Laboratory Attendants and one position each for Clerk, Boiler Operator and an Office Attendant. The department has eleven laboratories and a glass blowing unit. The computer aided process design centre (CAPD) with nineteen computers provides computer facilities to the students of the department. The students have the access to the university main library in addition to a small collection in the department.

3. AIMS AND LEARNING OUTCOMES

3.1. Aims

The aim of the department is to provide theoretical and practical knowledge of Chemical and Process Engineering and related topics for its useful applications in the industry, commerce and society. The degree program produces high quality graduates for careers in industry, as practicing engineers and scientists having due awareness of the social, economic and environmental aspects of the process industry.

In this context the aim of the DCPE is to provide;

- An undergraduate program which provides the student a broad understanding of the Chemical and Process Engineering (CPE) reinforced by greater depth of understanding in certain specialized areas with emphasis on the acquisition of knowledge and expertise related to industrial processes.
- Postgraduate degree courses to provide advanced knowledge and understanding on CPE and polymer technology in order to prepare the students for further research studies and careers in industry.
- A range of learning opportunities within the semester system, enabling students to gain theoretical and practical knowledge on CPE.
- Opportunities for students to develop competence in oral and written communication, information technology and communication technology skills that will enable them to meet the needs of the prospective employers and to contribute effectively in their chosen careers.
- A friendly and a responsive environment in the department by improving the staff student and student- student interaction.
- Opportunities for students to gain knowledge on non-technical subjects.
- A good learning environment and encouragement for the students by providing awards and bursaries, enabling concentrating by students on realizing the core objectives.
- Opportunities to develop and maintain links with the industry internally as well as externally for Mutual benefits.

3.2. Learning Outcomes

Expected Learning outcomes in B.Sc. Engineering undergraduate program

- A firm grasp of fundamental concepts and principles of CPE, economics, management and fluency in mathematics.
- Problem solving skills necessary to tackle new challenges throughout their careers.
- Possession of experimental skills in measurement related to chemical engineering science and applications at both laboratory and pilot plant scales.
- Familiarization with the use of a range of modern ICT tools for communication, information searches, calculation and specialized chemical engineering applications, and be able to use these tools efficiently and creatively.
- Capability of working in a group or carrying out independent project work.
- Good oral and written presentation skills.
- Acquisition of design skills to be able both individually and within a team, and with limited supervision, to carry out design tasks for a wide range of chemical processes and plant.
- Satisfy the academic requirements for Associate Membership of the Institution of Engineers, Sri Lanka (IESL) and membership of Institution of Chemical Engineers in United Kingdom (I.Chem.E UK) and American Institution of Chemical Engineers (AICE).

Expected Learning outcomes in the Postgraduate course in Polymer Technology;

- A firm grasp of fundamental concepts and principles of polymer science, technology and processing, product design, and management.
- Problem solving skills necessary to tackle new challenges throughout their careers.
- Possession of experimental skills in measurement related to polymer science, technology and processing and applications at laboratory, pilot plant and industrial scales and use of modern ICT tools for related applications.
- Capability of working in a group or conducting independent project works.
- Good oral and written presentation skills.
- Gain skills to integrate their background knowledge on sciences or other disciplines in engineering suited to polymer industries.

Expected Learning outcomes in Postgraduate course in Advanced Chemical and Process Engineering;

- Gain core chemical engineering skills with in-depth specialist knowledge and attain working level of competence either in specialist branch of the subject or in the management level.
- Gain sufficient skills to integrate their background knowledge on the CPE or other disciplines in engineering, to process industries.
- Enabling CPE graduates to get an in-depth understanding of evolving developments in CPE for better local application of knowledge and for career advancement.

Expected Learning outcomes in Postgraduate courses in Chemical and Process Technology;

- A firm grasp of fundamental concepts and principles of CPE sciences and management.
- Problem solving skills necessary to tackle new challenges throughout their careers.
- Possession of experimental skills in measurement related to chemical engineering science and applications at both laboratory and pilot plant scales and modern ICT tools for related applications;
- Capability of working in a group or independent project work.
- Good oral and written presentation skill;
- Gain sufficient skills to integrate their background knowledge on sciences or other discipline in engineering suited to process industries.
- Enabling graduates of other fields who are working in the CPI sector to get an adequate understanding of the CPE.

4. FINDINGS OF THE REVIEW TEAM

4.1. Curriculum Design, Content and Review

(1) Curriculum Design, Content and Review

Good Practices

- Regular Curricular Revisions in 1972, 1990, 1994, 2000 and 2004. [Sources: Self Evaluation Report, Presentation by the DCPE, Discussions with academic staff]
- Stakeholder (Industry, Graduates, Students) Involvement in Curriculum Revision [Sources: SER, Meeting with Staff]
- Addressing the modern trends (e.g. Biochemical Engineering) [Sources: SER and Discussions]
- Industry leader position in polymer technology. [SER, presentation and Discussions]

The curriculum of the DCPE was developed initially in 1972 to be in line with the Chemical Engineering curricula of the University of Leeds, UK. Since then it has been revised several times to meet the relevant issues of the Sri Lankan industry. The introduction of Polymer Engineering subjects in 1990 to the B.Sc. Eng. curricula was one such change to meet the demands of the polymer industry. The three optional subjects Environmental Engineering, Biochemical Engineering and Food Process Engineering were introduced for the final year in 1994 to emphasize the diversity of the Chemical and Process Engineering field. In year 2000, UOM Engineering Faculty moved from three term system (old curriculum) to the credit based semester system. In this semester system students have to earn a minimum total of 150 credits out of which 135 are GPA credits and 15 are non-GPA credits, during the four year period. These 135 credits have to be earned from Basic Engineering subjects, Core Chemical & Process Engineering subjects and specific role oriented subjects. The course reflects modern concepts of engineering education and training, incorporating both communication and management skills together with a significant design element. Design is integrated throughout the curriculum, beginning with the first-year engineering course and continuing through the higher levels, with a comprehensive design project in the final year.

CPE has a mandatory six-month industrial training period (6 non-GPA credits) at the end of Level 3 (i.e. seventh semester). This gives the students practical experience in industry,

complements the academic components of the undergraduate curricula. As understood by discussion with the Faculty and students, the students gain useful skills and work experience valued by prospective employers.

The curriculum is enriched through subjects with a presentation component to improve communication skills at each level.

The students are also given a comprehensive knowledge in the field of mathematics so that they are useful in their future career.

The present degree program is accredited by the Institution of Engineers Sri Lanka (IESL) and is valid till 2008.

As indicated by the DCPE, the latest progress in the curriculum development was the Gap Analysis with an accredited Chemical Engineering Program and restructuring of the departmental curricula. This was done in year 2004 in order to get the study program accredited by the UK Institute of Chemical Engineers (IChemE) to get international recognition and to attract and create jobs for the graduates. A feedback was also taken from the staff and first batch of students who completed the semester system. The revised curricula have been proposed to the Engineering Faculty of UOM and are awaiting approval (May 2005).

The review team is of the opinion that this aspect in the DCPE could be judged as good.

4.2. Teaching, Learning and Assessment Methods

Teaching activity in most subjects is based on lectures, experimental classes, tutorials, project assignments, and Industrial training. Methodology of lecturing adopted by the lecturer was seen to be aided by one or a combination of; green/white board, overhead projector, multimedia and printed lecture notes. The observed lectures seemed to be well prepared, delivered well and met the stated learning outcome. The students were learning by listening, seeing, taking down notes and by discussion.

Experiments are designed to develop data recording, calculation, analysis and interpretation skills. Practical classes were observed being carried out in groups of students varying from 2-12 per group. Group size depends on the time and resources (lab and human) availability. The QA review team felt that students may not get the benefit of the lab session due to resource limitations. The reviewers observed the practical classes being conducted and guided by an instructor. Providing instruction sheets prior to the scheduled time and the presence of a senior lecturer in practical classes would have been beneficial. The reviewers were concerned about the non availability of standard lab safety practices.

4.2.1 Good Practices

- Teaching and learning are carried out through a combination of methods such as lectures, tutorial assignments, practical classes, industrial visits, industrial training [Sources: SER, Discussions with students and staff]
- Final year comprehensive design project – application of learnt theories to design a plant [Sources: SER, Discussions with staff]
- Uniform assessment method for the Faculty. For most course units 30% for CA and 70% for ESE. [Sources: Performance Criterion, SER, Discussions]

- Dean's List – providing encouragement for students [Sources: SER, Discussions].
- One week period allowed between the Department Meeting and Board of Examiners – Allowing students to appeal for re-correction. [Source: SER – pp. 12-13, Discussions with students and staff]
- Sometimes the examiners are allowed to change the range of marks for grades, on their judgment. (No rigid range) [Sources: SER, Discussions with staff]

4.2.2 Weaknesses

- 2 to 12 students in sub-groups in practical classes (some students do not get experience in some experiments, being just observers) [Sources: Observations; Discussions]. This limitation arises from labs originally designed for 10-20 students now being used for classes of 50.
- Senior Lecturers/Lecturers are not present at practical classes; most of the time instructors conduct experiments [Sources: Observations; Discussions]. The instructors may not have had hands on experience on the practical they teach, being only observers as students.
- Lab safety for students has to be improved [Sources: Observations in lab classes]

Some teachers noted the absence of a podium, forcing the lecturer to teach at the same level as the students, is a disadvantage when teaching large classes of 120 students.

It was revealed from the discussion with staff and students that industrial visits are arranged for the students to observe application of the theories that are taught in the University and for them to understand better and engrave those theories in their minds.

Students undergo a six months industrial training period at the end of Level 3 Semester 1 (i.e. the 6^{th} semester). This enables students to experience in-plant work in an area of their preference within the CPE programme.

As per the details available for the review team, the final year students carry out a Comprehensive Design Project enabling them to apply the chemical engineering and other design theories learnt. This allows development of specialized skills related to that equipment and promotes self-design capabilities.

The review team witnessed development of an **e-portal** containing information for students. This facility is expected to enhance student's self-learning abilities.

4.3 Assessment Method

4.3.1 Quality of Students, Progress and Achievements

In the DCPE program different assessment methods are used to determine the achievement level of the stated learning outcomes. The performances of each student in most of the modules are evaluated by continuous assessment and by an end of semester examination. In most modules the continuous assessment component carries 30% and the end of semester examination 70% of the total marks. The continuous assessment of a student is done based on their laboratory practical class reports, assignment reports, case study presentations, factory visit reports, quizzes and mid-term tests. All candidates should obtain at least 40% of the continuous assessment marks at all levels to qualify to sit the end of semester examination. The end of the semester examination assesses student's knowledge transferred during lectures and information gathered from reading material. Examinations are designed to test student's ability to perform under time limitation without referring to their lecture notes or any other

material. Examination questions take different forms such as, short notes, essays, numerical problems, results interpretation and multiple-choice questions. A minimum requirement of 20% should be obtained from the end of the semester examination in order to obtain a pass for a module. This is a University requirement applicable for all modules. The results are given to students in writing.

4.3.2 Good Practices

- Good results at A/L examination and High demand for UOM [Sources: SER, Discussions with staff]
- Progress monitored at the Dept. level; students are allowed to appeal for re-corrections. [Sources: SER – pp. 12-13, Discussions with students and staff]
- Dean's List – continuous encouragement for improvement [Sources: SER, Discussions with Dean and HoD]
- High achievements at the end [Sources: SER – p. 16, Discussions with Staff]

Assessment of all the courses has been done uniformly throughout the Faculty and it is clearly stated in the Performance Criterion given to all students.

It is made clear that examination papers are moderated by internal moderators to ensure questions are clear, relevant and coverage is appropriate. The answer scripts are marked anonymously according to the marking scheme prepared by the examiner and the answer scripts/marks are moderated by the same moderator for the module. The review team appreciates the fact that marks are displayed on the notice board and the students are given a chance to apply for re-correction within one week.

The review team considers that overall teaching, learning, and assessment aspects are good.

4.3.3 Quality of Students, Including Student Progress and Achievements

Students who apply for the DCPE have to be first selected to the Faculty of Engineering, University of Moratuwa by obtaining the required Z score for the physical science stream for the respective year. Out of the three Engineering Faculties in Sri Lanka, University of Moratuwa is the preferred choice of students in the merit list. About 40 of the first year students are leaving the course preferring other foreign scholarships (e.g. Australian undergraduate scholarships) available based on performance in the G.C.E. Advanced Level Examination. Students who are enrolled in the Faculty of Engineering follow a general engineering course of study conducted by the Faculty of Engineering and supported by all the departments.

On the basis of the results of the semester two examinations in Level 1, the students are given the option to select their preferred program of study. A total of 50 students are selected to DCPE out of a total engineering student population of 600.

Usually the Output/Input ratio will be > 0.95. This is in common with other study programs of the university. As a well recognized institute, there is a great preference for entry and with entry; the intention is to complete the program within the minimum period possible. As seen in Table 5.3, Appendix I, the length of undergraduate study is between 4.5 – 5 years. Those who enter, normally leave the course after completing more or less on time, especially in

Engineering. This shows that the students are adequately prepared to complete the program satisfactorily.

Student performance is monitored at the end of each semester by calculating a SGPA to enable students to assess their own progress, to establish whether they are experiencing problems, and to ensure that they are suitably equipped to proceed to the next year of study. The students who have performed poorly but yet passed are given an academic warning and restricted in their choice for optional subjects.

A high level of success is achieved by students on DCPE program. At least 10% of the students obtain a First Class. In the year 2002, 7 out of 30 students (23%) obtained First Class pass. Students who obtain a GPA greater than 3.8 are included in the "Deans List". Two students out of 50 obtained a GPA over 3.8 thus being entitled to a First Class from the last batch that graduated (2000 intake). 24% of the students of the same batch obtained a GPA above 3.5 thus obtaining at least a second-class lower division pass.

Considering all the above the review team judged this aspect as good.

4.4 The Extent and Use of Student Feedback

Qualitative student feedback is obtained by Informal discussions between students and level coordinators, Informal discussions between students and academic advisors, Final year student feedback forums, Student/ staff liaison committees, *CPE-Messenger*: e-based communication system etc.

The DCPE has appointed academic staff members as level coordinators for each level. The students discuss all the academic matters related to that level with level coordinator.

The students get the opportunity to discuss any academic or personal matters with their academic advisors, who are appointed by the Head of DCPE. Each academic advisor is responsible for a group of students throughout their studies at DCPE.

Qualitative student feed back is obtained through discussions at the student/staff liaison committees at the faculty level and the departmental levels. The departmental student/staff liaison committee is chaired by the Head/DCPE and the level coordinators and the batch representatives are met regularly to discuss the issues related to the subjects offered by the chemical engineering department as well as other departments such as Computer Science and Engineering, Management of Technology and Mathematics. However, the DCPE discourages students from raising issues concerning individual staff members in such a public forum. Students can raise such matters with the level coordinator or with the feedback form.

* It was indicated by the students that in some occasions, student feedback was not given due consideration (by the relevant teachers) in the following semesters. Some of the students were in the opinion that, student feed back should have taken in to consideration in major syllabus reviews.

However the review team felt that the students' feed back has generally been effectively used and the review team agrees that a good grade can be given to DCPE in this aspect.

4.5 Postgraduate Studies

At present, the DCPE conducts three PG taught courses and postgraduate research degrees, namely M.Sc. /PG Diploma in Polymer Technology, M.Eng./PG Diploma in Advanced Chemical and Process Engineering, M.Sc. /PG Diploma in Chemical and Process Technology. Research degrees awarded are M.Sc. (One Year full time), M.Phil. (Two year full time or 4 years part time), and PhD (Three year full time and six years part time). Students follow course modules during the first year on part time basis. First year work is assessed by the end of year or end of semester examinations. Students who successfully complete the first year are registered for the research component. The students select a research topic suggested by a staff member or select an industry related problem at their place of employment. An internal supervisor and an industrial co-supervisor guide the student. A dissertation is submitted at the end of the research project and a viva voce examination is held. The assessment committee will comprise internal & external examiners. Students who are successful in both components are awarded a M.Sc. or M.Eng. Degree. PG Diploma is awarded to those who pass only the written examinations based on the first year taught courses.

The division of PG studies headed by the Director, PG studies of UoM handles administration duties of PG degrees. Introduction of new PG courses or subjects, admission of students, assessments, examinations, appointment of examiners and moderators and other matters related to PG studies, originating from the DCPE are approved by the Faculty Higher Degrees Committee (HDC) chaired by the Director PGS, Faculty and the UoM Senate. Entry qualifications of the PG students are governed by the University By-Laws. Division of PG studies stipulates guidelines to research students and supervisors.

PG taught courses are coordinated by two academic staff members in the respective department, course coordinator and the research coordinator, for the specified course. Research degrees are monitored by the Research coordinator of the DCPE, who is the member of the HDC representing the Department.

The review team got the feedback from the research students. They are happy to be students here, and look forward to be guided by a capable panel of teachers. Only complaints were regarding the lack of space, lack of internet facilities and about not having access to labs 24 hours, for their research work. These problems were discussed with the staff and some solutions were promised immediately, while others are to be addressed soon with the availability of a new building and facilities soon to be obtained through the IRQUE grant.

Hence, this aspect can be considered good.

4.6 Peer Observation

It was revealed during the visit that there is regular effective peer observation**.** Staff members arrange for one member of the staff to observe them teaching, usually once a semester. The feedback on preparation, method of teaching, delivery, lecture materials, relationship and interactions with the students is obtained through a standard form. The staff also informally discusses the problems arising during academic activities, course content, teaching methodologies, learning and assessment methods and new developments of subjects. The observations are communicated to the HoD who meets the staff member and peer if

necessary. The Department meeting is used as a forum to inform others of good practices developed by the colleagues, and to encourage avoiding the weaknesses. Temporary staff members are continuously monitored and informal feedback is provided whenever necessary. Considering the above, the review team is of the opinion that this aspect is satisfactory.

4.7. Skills Development

Students get an opportunity to develop their skills in areas such as photography, computer use and inter personal skills. In addition, field trips arranged for the specialized programs also provide part of the knowledge. The Chemical Engineering Student Society (ChESS) is active and is involved in science dissemination work among the schoolchildren. During the post-Tsunami work, DCPE students have been in the forefront of the UoM effort, distributing disinfectants and other necessities among the displaced people. The students were given a chance to serve the nation, while developing their skills in management and in responding to emergencies, under the able guidance of the teachers of the DPCE. Considering the above, the review team judges this aspect as good.

4.8. Academic Guidance and Counseling

The Faculty of Engineering of the UoM has a student Counseling system selecting one from each department, appointed by the Vice Chancellor. The DCPE also has a representative in this group. Students have easy access to the Student Counselor. Also the UoM provides Career Guidance through the Career Guidance Unit.

An admirable feature is the provision of a Professional Full Time Counselor, through the University. He provides professional counseling to the students who require special attention.

Also the faculty has Staff-Student Liaison committee at faculty level, having representatives comprising senior academic staff and nominees from student groups.

The DCPE staff has been reported as one of friendliest in Faculty (SWOT analysis, IRQUE report). This friendly atmosphere allows the students to discuss their problems freely.

The Director of Undergraduate studies provides guidelines, performance criteria and registration procedures to students. The student performance records available at this office allow the students plan their academic activities accordingly. The students are provided a course outline (containing course objective, learning outcome, subject coordinator, lecturers, module content, evaluation criteria and a list of references), at the beginning of each semester for each subject. The students are encouraged to discuss the subject matter with respective subject coordinators or the lecturers.

The DCPE has appointed Level coordinators at each level (for the four levels of study) to guide the students on subject selection and other academic issues related to each level. The DCPE has appointed advisors for each student to provide guidance and necessary counseling.

5. CONCLUSIONS

Curriculum Design, Content and Review: The Faculty Curriculum Development Committee had revised the curriculum every 4 years since 1990. Past students' views were also taken into account in the curriculum review. The last curriculum review was done in 2004. Review team is satisfied with the development shown in this aspect. *Judgment: Good*

Teaching, Learning and Assessment Methods: A number of teaching methods are used and the courses are taught mainly by lectures, practicals, discussions etc.. Assessment of all the courses has been done uniformly throughout the Faculty. To further improve the teaching and learning process it is recommended that better computer and laboratory facilities are provided. *Judgment: Good*

Quality of Students, Including Student Progress and Achievements: Students with a good performance at the GCE advance level apply for this course. The review team noted that the performance of students during the program shows an improvement. Almost all the students have successfully completed the degree, and a considerable number of them obtained classes at their first attempt. *Judgment: Good*

Extent and use of Student Feedback, Qualitative and Quantitative: The teacher evaluation by students is implemented on a regular basis at present. When the curriculum have been revised, feedbacks from the immediately passed out graduates, undergraduates and the industry were given due consideration. Though some students had reservations about use of student feedback, generally it can be concluded that the students' feed back has been effectively used in the Department. *Judgment: Good*

Postgraduate Studies:
At present, the DCPE has postgraduate (PG) taught courses and postgraduate research degrees, namely M.Sc. /PG Diploma in Polymer Technology, M.Eng./PG Diploma in Advanced Chemical and Process Engineering, M.Sc. /PG Diploma in Chemical and Process Technology. Research degrees awarded are M.Sc. (One Year full time), M.Phil. (Two year full time or 4 years part time), and PhD (Three year full time and six years part time). The students are happy with the guidance they get and wish for some more facilities, which the review team feels can be provided by the DPCE within the next two years.
Judgment: Good

Peer Observation: There is effective peer observation as elaborated in section 4.6. *Judgment: Good*

Skills Development: Students are given opportunities to develop their skills in areas such as presentation, computer and personal skills. It is recommended that the computer facilities available to the students be enhanced if means can be found. *Judgment: Good*

Academic Guidance and Counseling: Senior student counselors who are academic staff members representing one from each department conduct routine programs at the faculty level on Counseling. In addition, there are other facilities made available as shown in section 4.8. An academic staff member to whom a student is assigned acts as the advisor, who meets the student routinely and assist him in solving academic problems s/he faces and level coordinators to help students about selecting course units and related issues. Provision of the services of a Full Time Professional Counselor through the University is a great step forward.
Judgment: Good

Based on the observations made during the 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	Good
Quality of students including student progress and achievements	Good
Extent and use of student feedback, qualitative and quantitative	Good
Postgraduate studies	Good
Peer observations	Good
Skills development	Good
Academic guidance and counseling	Good

6. RECOMMENDATIONS

Based on the findings indicated above the review team wish to make the following specific recommendations.

- In most of the aspects the review team found the way things are done at the DCPE are commendable, and can serve as a model for other Departments in Sri Lankan Universities. While sharing the lack of funds and other problems inherent to all the Sri Lankan universities, the high moral and positive attitude of the staff should be commended. The review team feels the leadership and collegiate management style of the HoD of the DCPE is greatly responsible for this high morale.
- It is recommended that the instructors be provided with training under the supervision of a senior staff member, before they carry out student experiments. The labs should be upgraded to support increased student numbers and to give every student hands on experience wherever possible. The lab safety should be upgraded.
- To further improve teaching and learning process it is recommended that better computer and laboratory facilities are provided.

7. ANNEXURES

ANNEX 1

Agenda for the Visit by the Review Team

Day 1 – 4th May, 2005

09.00 – 09.30 Meeting with the Dean and Head of the Department
09.30 – 10.00 Discuss the Agenda for the Visit
10.00 – 10.30 Tea Break
10.30 – 11.30 Department Presentation on the Self Evaluation Report
11.30 – 12.30 Discussion
12.30 – 13.30 Lunch Break
13.30 – 14.30 Observe Departmental Facilities
14.30 – 15.30 Observe other facilities of the Department
15.30 – 16.30 Meeting with Department Academic Staff
16.30 – 17.30 Meeting of undergraduate students
17:30 – 18:30 Brief meeting of reviewers

Day 2 – 5th May, 2005

09.00 – 09.30 Observe Teaching – Lecture (CH 409 – Process Analysis & Control)
09:30 – 10:00 Observe Teaching – Lecture (CH 101 – Process Engineering)
10.00 – 11.00 Observe Documents (Working Tea)
11.00 – 12.00 Meeting with Technical Staff and Other Non-Academic Staff
12.00 – 12.30 Meeting with postgraduate students
12:30 – 13:30 Lunch Break
13.30 – 14.00 Observe Teaching Lecture (CH 433- Biochemical Engineering)
14.00 – 14.30 Observe Teaching Lecture (CH 206- Chemical Kinetics & Thermodynamics)
14.30 – 15.00 Observe Teaching - Practical class (CH 432 – Polymer Characterization)
15.00 – 15.30 Observe Teaching - Practical class (CH 410 – Process Equipment Design)
15.30 – 16.30 Observe Other Facilities (Library & Computer Centre)
16.30 – 17.00 Meeting of Reviewers

Day 3 – 6th May, 2005

09.00 – 09.30 Observe Teaching – Practical Class (CH434, Food Process Engineering)
09.00 – 09.30 Observe Student Project Presentations
10.00 – 10.30 Academic Guidance and Counseling Core Aspect Meeting
10.30 – 11.00 Reviewers Private Discussion
11.00 – 12.00 Meeting with Head and Staff for Reporting
12.00 – 13.00 Lunch Break
13.00 – 17.00 Report Writing

ANNEX 2
List of Persons Met During the Visit

- List of Academic Staff Members:
  1. Prof. Ananda Jayawardene, Dean, Faculty of Engineering,UoM
  2. Dr. Ajith De Alwis, Head/Department of CPE
  3. Dr. B.M.W.P.K. Amarasinghe, Senior Lecturer
  4. Dr. A.D.U.S. Amarasinghe, Senior Lecturer
  5. Ms. S.M. Egodage, Senior Lecturer
  6. Dr. M.Y. Gunasekara, Senior Lecturer
  7. Dr. (Ms) F.M. Ismail, Senior Lecturer
  8. Mr. S.A.S.Perera, Senior Lecturer
  9. Dr. B.A.J.K.Premachandra, Senior Lecturer
  10. Dr. S. Walpalage, Senior Lecturer
  11. Dr. S.L.J. Wijeyekoon, Senior Lecturer
  12. Dr. (Ms) O. Gunapala, Senior Lecturer
  13. Mr. M. Hettiarachchi, Lecturer on Contract
- Discussions were held with 42 students representing second and fourth levels, and six postgraduate students.

- Discussions were held with the members of the Technical and Non-Academic Staff of the Department (i.e. 7 Technical Officers, 1 Clerk, 5 Lab Attendants and 1 Boiler Operator).

ANNEX 3
List of Teaching Sessions Observed

5th May, 2005
Lecture (CH 409 – Process Analysis & Control)
Lecture (CH 101 – Process Engineering)
Lecture - CH 433- Biochemical Engineering)
Lecture (CH 206- Chemical Kinetics & Thermodynamics)
- Practical class (CH 432 – Polymer Characterization)
- Practical class (CH 410 – Process Equipment Design)

6th May, 2005
- Practical Class (CH434, Food Process Engineering)
- Student Project Presentations

ANNEX 4
List of Facilities Observed

- Lecture Theatres
- Laboratories (Unit operations, Instrumentation and Control, Energy Engineering, Polymer processing, Physical Testing, Latex technology, Environmental Engineering, Food and Biochemical Engineering, Industrial Chemistry)
- Process Instrumentation Centre
- Glass Blowing Centre
- Computer Aided Process Design Centre
- Resource Centre
- Office Space and Staff Rooms
- University Library and Computer Centre
- Bio Gas Unit and Solid Waste Treatment Unit
- Canteen Facilities

ANNEX 5
List of Documents Observed

- Performance criterion for B.Sc. Engineering degree program
- University corporate plan, Calendar for B.Sc. Engineering Undergraduate students
- Details of faculty subcommittees
- CPE Passport 2005
- Detailed Syllabi of the Course Units conducted by the Department
- Minutes of the Departmental Meetings and the Minutes of the Curriculum Development Committee Meetings
- Past Question Papers, Marking Schemes, Final Year Students' Project Reports, Students' Practical Record Books
- Teaching Material (lecture and practical handouts)
- Summaries of the Teacher Evaluations by the Students and the Related Forms
- Peer observation forms
- Summaries of the surveys conducted by the Department
- Report on the SWOT analysis conducted by the department
- Research Papers and Other Publications by the Academic Staff Members of the Department