

1 RATIONALE

Competitiveness in trade and industry has always posed challenges to human resource development activities in our country. So far it has been possible to fulfill the technical manpower needs of the industry through standardized conventional courses: The product of technical education system is accepted and then suitably adapted by the industry according to their needs. There were very few problems in this kind of arrangement because the technologies utilized by the industry were fairly established and they did not change over a long period of time. It was therefore possible to design generalized educational programs that would cater to the needs of majority of industries.

All this has changed now. Through free trade among the GATT countries, globalizes economy, change in the licensing and patenting policies and multinational organizations entering in the Indian market, the country is now facing a major economic upheaval. This means that Indian industry will have to adopt new strategies in order to survive in the changed environment. This further implies that technical education system must now not only expand quantitatively and qualitatively but also change its internal structures, so that it can meet the varied and rapidly changing demands of the industry.

It is quite obvious that the present centralized education system is quite incapable of coping with the new challenges. There is a need to promote active interaction with the local environment and speed up "responsiveness" also, by localizing the decision making process. The logical corollary is that individual institutes must be granted autonomy to design and implement their own educational programs, suitable to the local industries, that the local industries themselves should be involved in the decision making processes of the institute, and that both should encourage freedom, innovativeness and Experimentation in the spheres of their activities to evolve a mutually beneficial relationship

2 WHY AUTONOMY?

Autonomy is a pre-requisite for growth and development, both internal and external. It gives authority to make ones own decisions about what to do rather than told by someone else what to do. The ultimate beneficiaries of autonomy are the industry and the society; The immediate beneficiaries would be the organization and of course, the students. Some important benefits of autonomy are listed below:

- ◆ Larger financial inputs by the government to strengthen infrastructure.
- ◆ Intensified curricular activities
- ◆ Frequent review and alterations in existing program.
- ◆ Devising new need based programs.
- ◆ Progressive designs for students assessment.
- ◆ Large scale academic reforms like multi point entry and credit system.
- ◆ Greater industrial exposure to students by introducing sandwich pattern.
- ◆ Enhanced industry-institute interaction through continuing Educational Programs, need based short courses, part time courses, consultancy services, extension services, and other industry oriented projects.
- ◆ Large scale training and placement facility.
- ◆ Career counselling and entrepreneurship development activities.
- ◆ Increased use of media and other innovative instructional methods for teaching.
- ◆ Use of computers and software production.
- ◆ Resource generation for the institute.

In pursuance of the progressive policy of strengthening technical education, the Government of Maharashtra has issued G.R.No. WBP-1093/[2640] [69]-VE-5 Dt. 30/05/94. And conferred autonomy on Government Polytechnic, Pune and some other institutes in Maharashtra. The freedom to decide and act would certainly bring about desirable changes and reforms more quickly. Though a high degree of autonomy would be related with academic as well as financial, administrative and managerial freedom, the academic autonomy which has been granted at this point of time is not less important: After all the academic sphere is the most vital component of any educational system and it is the immediate concern of the teacher, student and community.

3 NEW FLEXIBLE SYSTEM

The conventional system is too rigid and unsuitable mainly because of the centralized and generalized curricula. Even though the lacunas in curricula are sensed they cannot be removed at once because the changes demanded by one institute would be out of place in another institute. The State Board of Technical Examinations is committed to implement uniform policies for all institutes. In consequence it is impossible to cater to the diversified needs of local industries just as it is impossible to allow students to take courses according to their special interests and aptitudes. It is a fixed path of studies for all the students, with fixed number of subjects, fixed duration, fixed methodology of teaching and fixed evaluation system prescribed to all. As a result, entrants to this system, having additional qualification, though granted exemption in some subjects, cannot finish the programmed earlier than the others. On the other hand some find the programme too difficult to finish in the prescribed duration : They either lag behind or drop out, while some can take the programmes in a stride. The faculty members too, have little or no room for experimentation and innovation in methodology or evaluation strategies. Thus, students become examination orientated and teachers are alienated from the curricular system.

If the technical education system is expected to meet the needs of industry by supplying highly "employable" technical personnel, with the required level of knowledge and skills, the system should be flexible enough to quickly adapt and take up new challenges. It should be designed in such a way that "each person should be able to choose his path more freely, in a more flexible framework without being compelled to give up using educational services for life if he leaves the system". [UNESCO Publication (1972)]

This was realized while framing the new educational policy in which one of the recommendations is "technical and management education programs including education in Polytechnics will be on a flexible modular pattern based on credits with provision of multi point entry". [6.6 (b) NEP 1986].

The rigidity as it exists today is really a result of the uniform policy of education. Under the autonomous status, institutes will be able to reduce the rigidity gradually and evolve a more efficient and effective system, which will be flexible enough to absorb the following reforms:

- 1 Provision for students having, additional qualifications than minimum prescribed, as well as high achievers, to complete the program earlier.
- 2 Provisions of diversified technological courses to fulfill the needs of local

- industry.
- 3 Facility to choose course according to needs interests and aptitudes.
 - 4 Provision of allied and additional courses to take care of individual growth and development.
 - 5 Encouragement for decision making and selection among students.
 - 6 Intensified curriculum development, innovation activities and frequent reviews and change.
 - 7 Progressive designs for students assessment.
 - 8 Devising new need based diploma program.
 - 9 Greater industrial exposure to students.
 - 10 Improved teaching methodology.

All the above aspects of flexibility can be introduced through multi point entry and credit system [MPESC].

4 MULTI POINT ENTRY

The eligibility for admission to the Polytechnic system is S.S.C. passed or equivalent, though students who seek admission may possess additional qualifications. Thus the entrant group may consist of different varieties eg. 10 10 technical, 10 ITI, 12 Science, 12 vocational/technical etc. In the present system of these are admitted in the first year diploma they are treated all alike. Even though they are granted exemptions in certain subjects, they cannot save their time and would have to complete the programme in 3 years only.

In the new system depending on the entry level appropriate number of credits would be sanctioned. Thus for example a XII Science students will be granted 32 credits and take a higher start than that of X students. The flexible system would allow them to complete additional courses from higher levels and there by saving time tat least by 6 months. The following figure illustrates the general entry points students might take.

Rapid technological advancement in different disciplines would necessitate that students should be offered a wide range of wourses to chose from the programmes of varying durations. They must be able to choose a specific "course mix" according to varied needs and interests, within and across disciplines. Some technicians from the industry might take new technology courses for updating knowledge and skills in desired areas.

5 CREDIT SYSTEM

For the award of Diploma students are required to earn number of credits. Credit point is defined as one clock hour. All contact hours, whether theory or practicals are expressed in terms of clock hours. Credit points assigned to each course [i.e. subject] per week will be total contact hours, including lectures and practicals, students whose terms are granted and who pass the end exam and / or practical/ oral will be said to have earned the credits prescribed for the course. On an average students will earn 32 credits in each term, if they clear at least 6 courses per term and complete the programme in 3 years duration, However they may either opt for offering minimum 3 courses or maximum 7 to 8 courses and might complete the diploma programme in 2 to 2 ½ years duration. They may leave the institute for some duration, rejoin and add credits. After completing the programme, they have an option to offer a few more optional courses from the same discipline or different discipline and have a unique combination of credits.

Appendix 1 specifies credits to be earned for a diploma and Appendix 5 details credits earned on entry by different variety of students. The system will be flexible enough to absorb the following variety of students:

- 10 with I.T.I. certificate
- 12 science and above.
- 12 vocational / technical and above.
- Engineering diploma holders.
- Candidates sponsored by industries.

6 LEVELS OF COURSES

In MPECS the curriculum is restructured: The courses are classified into 7 categories according to functions they perform in the total scheme of diploma program. Each category of courses has been assigned a level number starting from 1 to 7. These levels signify a certain hierarchical order, from foundation to diversify. Thus the nature of any given course will depend upon the level prescribed for the course.

The following 7 levels have been identified.

- **Foundation Courses.**

These form basis for study in engineering and technology and are indispensable because all basic and applied engineering has their origin in pure sciences. Study of sciences develops an insight in engineering and technological courses. A language course is also included in this group since it is the medium of instruction and as such is fundamental to comprehension and communication.

- **Core Technology Courses**

These courses impart knowledge and develop skills in some engineering areas, which cut across disciplines and must be acquired by all prospective engineers; e.g. engineering drawing, workshop practice, applied mechanics, computers etc.

- **Auxiliary Courses**

This is a miscellaneous collection of courses administered with a view to provide an opportunity for all-round development of personality. These courses encompass aspects like utility, social consciousness, aesthetics, ethics, hobbies etc. And also provide additional competence / skills which might be helpful in study at higher levels as well as in the profession.

- **Basic Technology**

These program-based courses provide groundwork to respective engineering programs. These courses facilitate transition from pure sciences to applied technologies.

- **Applied Technology**

These courses are expected to develop professional abilities in desired areas among the students so that they can perform their job functions efficiently in chosen fields of engineering.

- **Allied Courses**

These courses would develop awareness about the managerial roles and skills expected of a professional. In view of the fact that an insight in human behavior helps in dealing with peers, workers and social groups, some optional courses from humanities area are also included in this category.

- **Diversified Courses**

These courses take care of diversified interests and needs. They provide a little more detailed knowledge in specific and newly emerged technologies in the concerned diploma program.

7 NEED FOR SEMESTER PATTERN

MPECS requires that there should be more opportunities for students to exercise options for selecting, adjusting and completing courses according to individual needs. In the Semester pattern, examinations are conducted twice a year, which means that students have two opportunities in a year to exercise options.

Secondly, in the Semester pattern, courses can be conveniently divided in smaller modules. This facilitates adjustments in administration of curriculum contents in smaller or larger quantities/quantums. For example in old yearly pattern, a subject would be studied necessarily for 1-year duration, whether it is needed or not. The only option left was to reduce contact hours. In the Semester pattern one can control the quantum of curricular inputs both by reducing / increasing credits or reducing / increasing the number of courses. For reasons such as these Semester pattern is a pre-requisite for any flexible system

8 ADMISSION

- Candidates who have passed S.S.C. with Physics, Chemistry, Maths and English or equivalent securing at least 50% aggregate (45% in the case of SC/ST) are eligible for admission to diploma programs.
- Admissions will be made strictly on merit and according to the prevailing rules framed by the Government of Maharashtra.
- Reservation quotas will remain operative as per the Government rules.
- On admission students possessing additional qualifications than The minimum prescribed will be granted credits as may be decided and notified by the equivalence committee of the institute from time to time, on the basis of equivalence of courses.

9 TRANSFERS

- Transfers from other Government Polytechnics and aided are allowed as per the existing rules.
- The admitted students are also allowed to transfer from one Diploma program to another within the institute, provided vacancies exist. Such transfers can be allowed only after keeping terms for level 1 and level 2 courses.
- Permission for any type of transfer is subject to the availability Of facilities.
- In the above transfer cases, credits to be granted to students will be decided by the equivalence committee.

10 COUNCELLING AND GUIDANCE

It is anticipated that students would need information on carrier opportunities, needs of the industry, employment profiles etc. The information may influence

decisions about selection of courses besides students may need guidance while sequencing courses and choosing particular path of study. They will get this kind of help from a specially created Counseling and Guidance cells. Most of the work currently done by the students section in each institute would now come in the preview of the unit. It is to be recognized that this unit would have peak working loads prior to and during admissions, immediately after declaration of results and during registrations. The unit will require a computer for the processing of data and its analysis from time to time.

10.1 Structure

- For its effective functioning the cell should have representations from all departments the supporting staff should also be trained from amongst those existing within the institute. The following may be the structure of the unit.
- Head or one faculty member from each department, programs of which are offered under MPECS.
- Training and Placement Officer.
- Controller of Examinations.
- Co-opted member/s

10.2 Functions

- Educating entrants about the structure and operation of the MPECS.
- Guiding entrants for first/initial as well as subsequent registration, exemptions and choice of courses.
- Counseling students who wish to withdraw/change courses already registered.
- Maintaining individual records of progress of students throughout the program.
- Educating the students on possible course choices at the beginning of each term.
- Providing academic profile of each student to each department.
- Gathering data regarding students results/assessment and feeding data to computer system.
- Continuously conducting studies on entry categories, course choices and performance of the students on various programs.
- Developing and maintaining database on entry categories/characteristics/program duration/pass rate/employment etc.
- Gathering data from industries and providing information on carrier opportunities to the students.

11 EXEMPTIONS

- 11.1** Students who are eligible to claim credits in equivalent courses must apply in prescribed proforma.
- 11.2** The claims for credits will be scrutinized and decision will be notified to the students.
- 11.3** Students who will not apply for claiming credits will lose their claim and they will be considered on par with the other S.S.C. passed students.
- 11.4** Students who have been granted credits will be supposed to have earned credits assigned to the equivalent courses in curriculum.
- 11.5** The following entrants can claim certain credits specified separately :
- i)** S.S.C. passed with I.T.I. certificate or equivalent.
 - ii)** H.S.C. (Science) passed or equivalent.
 - iii)** H.S.C. (Vocational) passed or equivalent.
- 11.6** Students admitted on the basis of S.S.C. but who attempted I.T.I. course or appeared at H.S.C. or H.S.C. voc./tech. Examination and passed with 40% marks in respective subjects can also claim credits as shown below:
- 11.6.1** HSC or HSC technical/Vocational students who passed in the following subjects.
(a) English (b) Physics and Chemistry
(c) Mathematics (d) relevant technical subject.
(NOTE : Point (d) above is applicable to HSC tech. / voc. Only)
- 11.6.2** Students passed in relevant technical subjects at ITI.
- 11.7** In any other cases claims for credits will be considered by the Equivalence Committee.
- 11.8** No credits will be granted to S.S.C. (Technical) passed and M.C.V.C.
(For exact number of credits to be granted see Appendix 5).

12.0 TIME LIMIT

- 12.1** Admitted students will have to clear all the courses prescribed for a diploma program within maximum 6 years from the date of admission to the polytechnic.
- 12.2** Students may clear individual courses in several attempts, subject to the conditions mentioned in 12.1 and 12.2 above.
- 12.3** Students leaving the polytechnic in between will be allowed re-admission at the point he left earlier and his break/s will be condoned within maximum six years, including breaks, from the date of admission.