

Enrichment of Professional Engineering Education

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ABSTRACT : Due to vast spread of engineering profession and industry, the engineering/technical education has grown rapidly. There is a need to update and enrich the engineering education by incorporation Engineering Management Programmes, Construction Technology & Management, Computer Education, Continuing Education, Refresher Courses, Information and Documentation etc. so that such professional education becomes more and more acceptable to the profession, to the Industry and to the Society.

Introduction :

Engineering can be termed as the logical explanation and application of common sense, supported by established and proven theories, scientific knowledge, invention, information etc. and the Engineering education is the continuous process of imparting knowledge, information and experience gained by one section of people to a larger group for the benefit of mankind. The education also inculcates a sense of discipline to prepare for the future and helps in development of Personality and character and positive thinking ability towards people, problem and the society.

Engineering Profession :

Engineering emerged as a profession with the advent of industrialisation. Most of the modern industries had their roots in the entrepreneurial efforts of young engineers, who set about exploiting the material resources to improve the quality of life and environment around them. Every enterprise owes its existence to the entrepreneurial instinct. Men

have set about working for lifetimes on account of challenges from a friend or foe.

Engineering Education :

The vast spread of engineering profession created a large demand for engineers and technocrats, thereby causing the spread of engineering education at all levels. The inputs for formal and regular engg. education being costly and limited, cannot be made available to all the aspirant, thereby creating the need for distance education, continuing education, correspondance education, open university, on job training in the industry etc. with greater importance day by day.

There is a need to update the professional education by incorporating regular correspondance lessons, personal contact sessions, T.V.Time, practical sessions, Information and Documentation Centres, Engineering Management Programmes, Project works, Construction Technology & Management, Computer Education, etc so that the professional courses become more and

more acceptable to the industry.

Open University :

Since all the requirement of engineering education cannot be fulfilled by regular engg colleges, it is necessary that Institutions like Institution of engineers cover their Courses to all the Registered students by correspondence, giving self contained lessons by eminent authors, besides standard text books to supplement their studies.

The Centres of Institution of Engineering could be developed as a fullfledged education Centres to impact practical and application aspect of various subjects on a regular basis. This will help students of correspondence courses also to develop themselves in engineering environment and attain a sort of engineering orientation, which is one of the main constraint and complaint of engineers, who come from regular courses. On this ground alone they have a tendency to disfavour students who come from such professional courses.

Engineering Management Programmes

There is also a great need to introduce new and comprehensive courses covering various aspects of management forms a significant portion of the work of engineers. They spend a substantial part of their carrier in performing the tasks that are predominantly managerial and the top management positions in industry are held by technocrats. Despite these, it is seen that traditional engg education impacts a very little preparation for engineering management. They hardly include one or two optional papers.

According to MA White The engg manager is

distinguished from others by the fact that he possesses both an ability to apply engg principles and a skill in organising and directing people and projects. He is uniquely qualified equally for two types of jobs simaltaneously

1) management of technical functions i.e. research, design, production in almost any engg enterprise and

2) management of proader functions i.e. marketing, commercial, projects management, top management etc. in the high technology enterprise subject to rapid technological changes.

The need for introduction an affective engg management programme open to all engg students by correspondence courses, is further highlighted in view of the scarce energy and resources positions.

Construction Technology and Management

The basic input to all the engg activities whether in services, production, communication, infrastructure etc. require the construction activities to be fulfilled. This basic fact alone may be sufficient to give a special status to construction technology and its management. Therefore, engg education and training, even by correspondence courses, ought to include the relevant curicula to cover these aspects.

It is generally misunderstood. that Construction activities relate to the civil, mechanical, electrical, telecommunication, instrumentation and so on with the background of social and behaviourial aspects as well as the science and arts of management.

The present development of construction technology and methods have necessitated the extensive use of construction equipment and tools, basic knowledge of mechanical engg and electrical engg with emphasis on construction equpt, managemnt of environment, management of social conflicts, basic and fundamental theories and design aspects of civil, mechanical, electrical engg. These are required to be included in the curriculum of engg education including correspondance courses, to enable the students to have a better grasp of vital construction activities, which form the core of all production and service industry.

It is all the more important in view of the fact that timely completion and commissioning of industrial units is the essence and starting point of regular production, which brings profits to the organisation. Any delay in timely commissioning not only increases the capital cost but also increase the interest on the capital as well as the loss of production during the delayed period.

Computer Courses

Computers are finding extensive application in all disciplines of engineering. Till recently the main frame computers were widely used but its prohibitive costs have restricted their use to Universities, Research Institutions and big Industries only. The advent of micro Computers and their applications all sorts of problems and industries have completely changed the scenario. These are reasonably priced in the field and finding place in most of the construction and design.

Although computer courses are offered by many institutions, most of them offer only the

introductory type. One more drawback is that most of these institutions do not have enough equipment including basic computers as well as support equipment.

Time has now come when extensive knowledge and training on computer applications need be imparted to the engineering students including professional courses. The in-depth knowledge may not be necessary but the syllabus should include details about different parts of a computer system and peripherals like tapes, diskettes, disks and various input and output devices including computer graphics, details about machine level and symbolic level languages and fundamentals of flow charting etc.

Continuing Education & Refresher Courses

In addition to the above courses to prepare basic engineering students, there is a great need for organising short term continuing education courses and Refresher courses for the engineers in Industry. In fact the industry can promote in a big way the growth of engineering ensuing continuing education of working engineers. These type of courses are essential to enable engineers to keep themselves abreast of the almost latest technological developments, managerial aspects of productivity, safety, economy and human relations etc.

If industry and institutions can get together and design a comprehensive environment oriented packages of engg curiculla, the chances of orientation in real life environment and acceptability of graduate engineers as capable engineer/manager might increase appreciably.

Students could also be offered courses like M.Phil, M.Tech, M.Sc. Engg etc, which they can take up on semester basis for short duration alongwith the regular students.

Information and Documentation :

It is necessary that the Informations available and the Experiences gained at the multidisciplinary Projects be properly documented and recorded at the Information and Documentation Centres to be developed at all Centres. Although these Information & Documentation Centres cannot be substitutes for the teacher, but if they are well equiped, they can serve the purpose to a great extent. These could also be used by Managers and Policy makers.

Conclusion :

Thus we come to a conclusion that there is a need to enrich and enlarge the engineering education to the extent that modern methods and management practices can be incorporated on a continuous basis with an added emphasis on practical application in industry.

The present day information technology can bring considerable benefit to technical education by way of providing flexible intrac-

tive system. This can make education more effective, more pleasurable and provide due motivation for further learning.

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