



Pretoria 0002 Republic of South Africa Tel 012-420-4111
Fax 012-420-4555 <http://www.up.ac.za>

Faculty Engineering,
Built Environment and Information Technology

Department Mechanical Engineering

GUIDELINES FOR THE INDUSTRIAL TRAINING OF MECHANICAL ENGINEERING STUDENTS (MPY 315 & MPY 415)

1. INTRODUCTION

Mechanical engineering students must gain **240 hours** of industrial experience at the end of their 2nd and 3rd years of study. The aim is to develop an insight in the practical application of engineering science in industry and the related human relationships and safety aspects. The Engineering Council of South Africa requires this type of experience in the training of engineering students.

Ideally the student's work should cover:

- ♦ Technical tasks and projects.
- ♦ University assignments (see attached).
- ♦ The writing of a technical report.

This work should preferably be performed under the guidance of a knowledgeable and experienced mentor.

The purpose of this document is to provide guidelines on students training. It sets an ideal with the realisation that it will not always be possible to meet all the recommendations in practice.

2. INTRODUCTION TO COMPANY

The student should understand the functioning of the organisation as a whole. Very often it is his or her first exposure to an engineering environment. A brief introduction to company structure and activities is therefore recommended.

Subsequent interaction of the student with the organization should promote the following:

- ♦ Exposure to organization policy and culture.
- ♦ Understanding of company structure and hierarchy.

- ◆ Contact with other employees in general.
- ◆ Contact with other engineering disciplines.
- ◆ Insight in project progress from the planning phase to completion.
- ◆ Introduction to communication procedures used, for example, reports, forms, drawings, etc.

3. **WORK CONTENT AFTER THE 2ND ACADEMIC YEAR (MPY 315)**

The nature of the student's work after the second year of study should be such that the student obtains:

- ◆ A broadening of his/her knowledge of mechanical systems and processes.
- ◆ The opportunity to work with artisans and experience the environment they work in.
- ◆ A broader knowledge of human relations.

During this period the student must study available literature on personnel management. A short report on personnel management as experienced in the working environment must also be written.

It is recommended that the student works with an artisan than can answer questions and give guidance. Exposure to several types of tasks is recommended. Examples are maintenance, manufacture, assembly and troubleshooting.

4. **WORK CONTENT AFTER THE 3RD ACADEMIC YEAR (MPY 415)**

It is recommended that the student who has completed the third (3rd) year of study, perform a small **mechanical engineering** project or projects which will bring him or her into wide contact with the company's technology, procedures and personnel. The project should fall within the scope of technological ability as supported by the subject matter of the first three (3) academic years.

Experience has shown that well-defined preliminary investigations or the preparation of requirements and specifications are suitable tasks. In this manner students should be able to make a positive contribution to the company while attaining a sense of achievement. A **mechanical engineering** mentor should be appointed to advise the student.

In addition to the project described above, the student is required to assess the work environment with reference to the Occupational Health Safety Act. As the students have very little experience in these areas they are instructed to discuss their opinions with their mentors and no one else. Students are required to prepare confidential reports on their findings and submit this to their mentors for evaluation and comments.

5. **REPORT**

The student must submit a report on the work performed and experience gained. The aim of the exercise is twofold.

- ◆ The student gains experience in the preparation of a technical report.
- ◆ It allows the employer and the University of Pretoria to evaluate the nature and quality of the student's work and the effort he or she has put in to make the training a success.

6. SCHEDULE AND WORK TEMPO

It is important that students are kept busy but also learn to be self-motivated. It is recommended that the student be allowed reasonably easy access to his/her mentor for advice and that frequent appointments (perhaps 10 minutes per day) be scheduled for formal evaluation and discussion of the following:

- ♦ Technical progress.
- ♦ Project progress.
- ♦ Record keeping and documentation.
- ♦ Planning and progress with the preparation of the technical report and verbal presentation if applicable.

7. EVALUATION

It is recommended that the mentor continually assess the student's progress. The evaluation procedure should be explained to the student at the beginning of the project. Evaluation would typically cover:

- ♦ Insight into work performed.
- ♦ Problem formulation (typically for 3rd years only).
- ♦ Concept generation (typically for 3rd years only).
- ♦ Systematic approach to the analysis of problems.
- ♦ Subject knowledge based on solution
- ♦ Preparation of the technical report and, if applicable, an oral presentation.

8. INTERACTION WITH PERSONNEL AND TRAINING SECTIONS

The ideal is that the student be molded not only as an aspirant engineer but also as a person and employee. It is thus desirable that the student should remain in communication with the personnel and training sections of the company, where applicable, for the duration of his or her employment.

9. CONCLUDING REMARKS

Practical work forms an integral part of the mechanical engineering syllabus. The department is grateful to all its industrial partners who offer students training opportunities and is at all times ready to do whatever is necessary to make a success of this cooperation.

It is suggested that the student give a brief oral presentation of the work done at the end of his/her training. This should preferably be to senior personnel. The time schedules should allow for an oral presentation and report preparation if applicable.