



UNIVERSITEIT VAN PRETORIA  
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## Faculty of Engineering, Built Environment and Information Technology

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## Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie

School of Engineering

Department of Mechanical and Aeronautical Engineering

MPY 315 and MPY 415: Practical Training

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Module coordinator: Dr Abrie Oberholster

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

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## 1 Overview

Mechanical engineering students must gain 240 hours of industrial experience at the end of their 2<sup>nd</sup> and 3<sup>rd</sup> years of study respectively. The aim is to gain insight into 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.
- 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 for students' training. It sets an ideal with the realization that it will not always be possible to meet all the recommendations in practice.

## 2 Departmental study guide

This Study Guide is a crucial part of the general study guide of the Department of Mechanical and Aeronautical Engineering, which is the host department for this module. In the study guide of the Department, information is given on the mission and vision of the department, general administration and regulations (professionalism and integrity, course-related information and formal communication, workshop use and safety, grievances, support services, plagiarism, class representative duties, sick test and sick exam guidelines, vacation work, appeal process and adjustment of marks, university regulations, frequently asked questions), ECSA Graduate Attributes, ECSA knowledge areas, CDIO, curriculum and assessment of cognitive levels. It is expected that you are very familiar with the content of the Departmental Study Guide. It is available on the Department's website.

[https://www.up.ac.za/media/shared/120/Noticeboard/2021/departamental-studyguide-eng-2021\\_version27may2021.zp204392.pdf](https://www.up.ac.za/media/shared/120/Noticeboard/2021/departamental-studyguide-eng-2021_version27may2021.zp204392.pdf)

Department Website:

<http://www.up.ac.za/en/mechanical-and-aeronautical-engineering/article/21692/noticeboard>

Take note of the specific instructions in the above study guide on:

- Safety
- Plagiarism
- What to do if you were sick (very important)?
- Appeal process on the adjustment of marks

### 3 Lecturers

The lecturer contact details are given in the table below:

<i><u>Role</u></i>	<i><u>Lecturer</u></i>	<i><u>Office</u></i>	<i><u>Telephone number</u></i>	<i><u>Email</u></i>
MPY315 lecturer	Dr Mostafa Mahdavi	ENG3 6-99	012 420 2935	<a href="mailto:mostafa.mahdavi@up.ac.za">mostafa.mahdavi@up.ac.za</a>
MPY415 lecturer	Mr Tlou Mokobodi	ENG3 6-81	012 420 5367	<a href="mailto:tlou.mokobodi@up.ac.za">tlou.mokobodi@up.ac.za</a>
Overall module coordinator	Dr Abrie Oberholster	ENG1 10-18	012 420 3288	<a href="mailto:abrie.oberholster@up.ac.za">abrie.oberholster@up.ac.za</a>

### 4 Correspondence

For email correspondence, it is required to use the keyword **MP315** or **MPY415** in the email subject line. Failure to do so may result in the email not being answered, or cause a significant delay in the email being answered. **The email should be addressed to the corresponding module lecturer.**

### 5 Introduction to company

The student should understand the functioning of the organisation as a whole. Very often, it is the student's first exposure to an engineering environment. A brief introduction to company structure and activities is therefore recommended. Subsequent interaction of the student with the organisation should promote the following:

- Exposure to organisation 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.

### 6 Work content after the 2<sup>nd</sup> academic year (MPY315)

The nature of the student's work after the second (2<sup>nd</sup>) year of study should be such that the student obtains:

- A broadening of the student's 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 and interdisciplinary coordination .

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 that can answer questions and give guidance. Exposure to several types of tasks is recommended. Examples include maintenance, manufacturing, assembly and troubleshooting.

## 7 Work content after the 3<sup>rd</sup> academic year (MPY415)

It is recommended that the student who has completed the third (3<sup>rd</sup>) 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 the student's 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 concerning the Occupational Health and Safety Act. As the students typically 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.

## 8 Report

The student must submit a report via clickUP on the work performed and the 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.

## 9 Schedule and work tempo

It is important that students are kept busy in a meaningful manner, while also learning to be self-motivated. It is recommended that the student be allowed reasonable 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.

## **10 Assessment by mentor**

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 should typically cover:

- Insight into work performed.
- Problem formulation (typically for MPY415 only).
- Concept generation (typically for MPY415 only).
- A systematic approach to the analysis of problems.
- Subject knowledge based on the solution.
- Preparation of the technical report and, if applicable, an oral presentation.

## **11 Interaction with personnel and training sections**

The ideal is that the student is shaped not only as an aspirant engineer but also as a member of society, professional 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.

## **12 Information sessions and material**

Prerecorded videos related to MPY315 and MPY415 are available on YouTube (<https://youtube.com/playlist?list=PLLJ4u1VDQXzcTI7drmJcMUPKarUgpymdz>).

Supporting documentation is available on clickUP and the departmental website (<https://www.up.ac.za/mechanical-and-aeronautical-engineering/article/48728/practical-training>)

Further questions will be addressed during online Question and Answer (Q&A) sessions via Blackboard Collaborate on clickUP during the start of the first semester. The final dates will be communicated via clickUP.

Details around second semester Q&A sessions will be communicated at a later stage.

### **13 Prescribed report structure**

The following report structure must be used in the reports:

1. Title page, containing the following information:
  - Student name and surname
  - Student number
  - MPY module e.g., MPY315: Practical training
2. Plagiarism form (completed in full and signed by student).
3. Employer form, which must be completed in full, signed by the employer and included a business or card included. The total hours must amount to at least 240 hours.
4. Abstract
5. Table of contents
6. Body of report, with sections and subsections as applicable for the company and work you carried out
7. Section on Personnel Management (MPY315) or OHS (MPY415)
8. Conclusion
9. References

### **14 Evaluation**

Report evaluation is done according to the rubric shown below. You need to score a minimum of 16.7% **for each subsection** to pass MPY.

Rubric for MPY 315 & MPY 415 practical report						
Subsection	Traits / Components	Criteria	Levels of Performance			Exemplary
			Does not comply	Inadequate	Sufficient	
			0	0	0	1
Subsection 1	Employer form	33.00%	No employer form(s)	Incomplete form(s)	Insufficient hours completed after 2nd/3rd year of study	Fully compliant form(s)
			<b>Rating Scale</b>			
			0	0	1	1
Subsection 2	Organisation	9.00%	Write a well organised report	Inadequate technical report. Not well-organised, with some critical aspects missing	Adequate organisation for a technical report. Small errors present and possibility of improvement	Perfect organisation
	Technical	12.50%	Illustrate and describe completed work	One or two pages describing the work and no supplementary figures, or work not suited for MPY	Several pages on the work that was completed	Very detailed illustration/description of the work that was completed. Clear pictures
	Language	12.50%	Use professional spelling and grammar	Errors in every sentence	Error on each page	Flawless document
			<b>Rating Scale</b>			
			0	0	1	1
Subsection 3	PM (MPY 315)	33.00%	Demonstrate understanding of PM	One/two paragraphs and no pictures	Shows adequate understanding of PM/OHS. Several paragraphs and pictures.	Good comprehensive discussion. Pictures illustrate the important concepts.
	OHS (MPY 415)		Demonstrate understanding of OHS			

## 15 Submission deadline

There are two opportunities to submit the MPY315 and MPY415 reports via Turnitin on clickUP:

Semester 1	18 March 2022, 23h59
Semester 2	19 August 2022, 23h59

The results will be made available around 1 month after the submission deadlines.

## 16 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 gives 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.