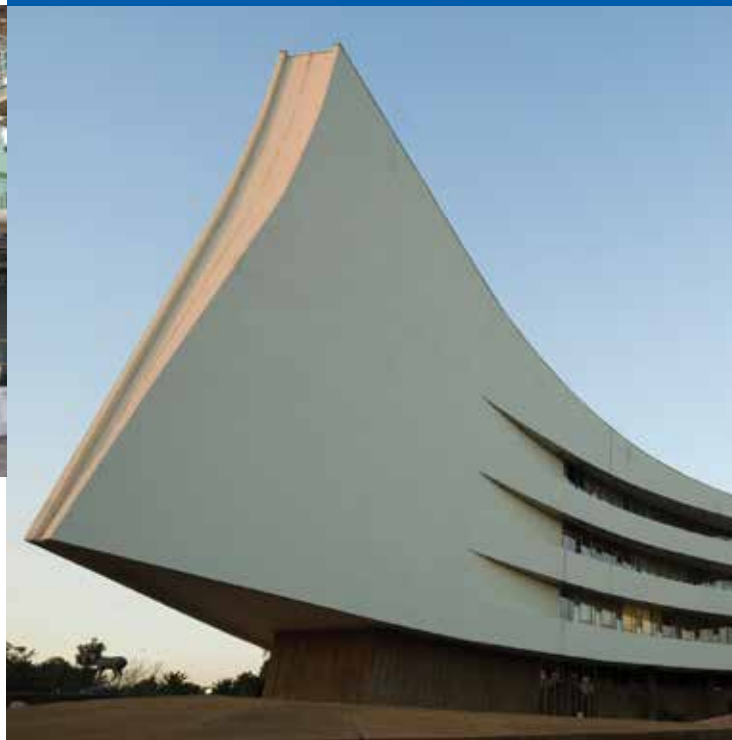
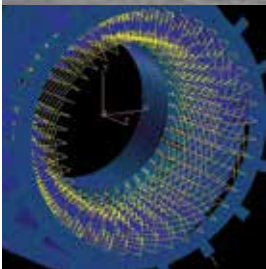




UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

## Multi-disciplinary Postgraduate Programme in Physical Asset Management



**Faculty of Engineering, Built Environment  
and Information Technology**

[www.up.ac.za/caim](http://www.up.ac.za/caim)

# Physical asset management spans many disciplines, both in the technical engineering domain as well as in the management domain. The University of Pretoria is proud to present this unique and comprehensive multi-disciplinary programme in physical asset management.

## The physical asset management challenge

**Physical Asset Management is the systematic and coordinated activity and practice through which an organisation optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditures over their life cycles for the purpose of achieving its organisational strategic plan (BSI PAS 55:2008).**

Management of physical assets such as plant equipment, buildings, aero structures, machinery and vehicles focuses at a strategic level on establishing, operating and maintaining an asset portfolio that is aligned with the organisation's strategic objectives, within the context of the regulatory and broader organisational environment. Issues such as an asset management policy, strategy and system, as well as asset performance versus cost with due consideration of health and safety, are of pertinent importance.

At an operational management and technical level this translates to the need for deep understanding of asset management principles and processes, enhanced by specialised technical knowledge and techniques related to aspects such as asset design analysis, data acquisition, condition monitoring, diagnostics and prognostics, all within the context of asset life cycle management.

Physical Asset Management is therefore a truly multidisciplinary challenge which draws expertise from diverse fields such as management strategy, process optimisation, quality management, machine condition monitoring, artificial intelligence, statistics, structural dynamics, finite element analysis, fatigue and many more.

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## The Multidisciplinary Postgraduate Programme in Physical Asset Management (PAM)

Utilising the broad skills base of the **Faculty of Engineering, Built Environment and Information Technology**, the University of Pretoria has developed a unique programme in Physical Asset Management which spans many disciplines across both the management and technical engineering domains.

Departments that participate in this programme are the Departments of Civil Engineering, Industrial Engineering, Mechanical and Aeronautical Engineering, Mining Engineering as well as the Graduate School of Technology Management. All these departments still offer their normal postgraduate programmes where students can specialise in specific disciplines.

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## Objectives of the Programme

This postgraduate programme consists of a course-based Honours Degree followed by a research dissertation for Masters Degree purposes. The Honours Degree can be completed full-time over a one year period, or on a part-time basis, typically over two to three years. Completion of the Masters Degree dissertation normally requires one year full time, or two to three years part-time research. The programme is designed to achieve specific objectives.

### The Honours Degree

- Theoretical understanding of the technical and management aspects of physical asset management.
- Exposure to the application of theoretical concepts through industry relevant case studies and assignments.
- Direct exposure to thought leaders in various disciplines.
- Interaction with a broad range of students.

### Masters Degree

- Achieve specialisation in a specific area.
- Produce novel research – publication of research results in a journal is required.
- Career enhancement by conducting research on industry/company related issues.
- Supervision by leaders in Physical Asset Management.

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## Structure of the Programme

Students enrol in either the **Department of Mechanical and Aeronautical Engineering (ME)** or the **Graduate School of Technology Management (GSTM)**, depending on their preference to have either a stronger technical (ME) or management focus (GSTM).

The first part (Honours Degree) of the programme is course based, with the student expected to complete at least eight 16 credit modules (128 credits in total), in line with the SAQA standard. This translates to approximately 1280 notional hours of study, which typically consists of 20 lecture hours per module, and the balance of study time made up of homework assignments. The second part of the programme entails extensive research which culminates into a dissertation (Masters Degree).

Students can structure their Honours programme to be multidisciplinary in that they can choose from a range of modules offered when constructing their course curriculum, within the following parameters:

- Two modules offered by ME and two modules offered by GSTM are compulsory.
- Another two modules must be selected from either ME or GSTM, depending on the student's preference to have a technical or management bias.
- A student can select a maximum of two modules from the other participating departments.
- Therefore, a student must complete a minimum of eight 16 credit modules, of which four must be from either ME or GSTM, and a maximum of two modules from other participating departments.



The programme is structured to be truly multi-disciplinary. The Honours Degree course modules (subjects) are a combination of management and technically focused subjects. Students have the option to incorporate industry related modules such as power generation, transportation and mining subjects into their honours degree programme.

## Honours degree modules

Students must construct a curriculum consisting of eight 16 credit modules.

### Compulsary modules

#### Management Focus: Graduate School of Technology Management

Maintenance Management IMC 780	16 credits
Asset Management IBB 780	16 credits

#### Technical Focus: Department of Mechanical and Aeronautical Engineering

Reliability Engineering MIR 781	16 credits
Maintenance Practice MIP 780	16 credits

Select an additional minimum of two and maximum of four modules if focus is on the management aspect of Physical Asset Management:

Project Management IPK 780	16 credits
Quality Management IKK 780	16 credits
Systems Engineering ISE 780	16 credits
Organisation and Innovation INV 780	16 credits
Engineering Economics IKN 780	16 credits

Select an additional minimum of two and maximum of four modules if focus is on the technical aspect of Physical Asset Management:

Maintenance Operations MIP 783	16 credits
Reliability-based Maintenance MII 781	16 credits
Condition-based Maintenance MIC 780	16 credits
Vibration-based Condition Monitoring MEV 781	16 credits
Maintenance Practice MIP 781	16 credits
Non-destructive Testing MSY 781	16 credits

Students have the option to choose a maximum of two modules from the curriculum of the other participating Engineering Departments. The following are typical examples of subjects offered:

#### Aeronautical Engineering

Aerodynamics MLD780	16 credits
Aircraft Propulsion Studies MAY780	16 credits
Control Systems MBB780	16 credits

#### Nuclear Engineering

Reactor Coolant Flow and Heat Transfer MUA782	16 credits
Reactor Engineering Science MUA873	16 credits
Reactor Materials Engineering MUA786	16 credits
Reactor Physics MUA784	16 credits

#### Automotive, Railway and Transportation Engineering

Vehicle Dynamics MV1780	16 credits
Multimodal Transport SVV788	16 credits
Infrastructure Management SSI790	16 credits
Transportation Planning SVC789	24 credits
Transportation Studies SVC790	24 credits

#### Power Generation

Fossil Fuel Power Stations MUU781	16 credits
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#### Mining Engineering

Financial Mine Evaluation PFZ780	16 credits
Surface Mining POY783	16 credits



## The programme is hosted by the Centre for Asset Integrity Management (C-AIM), Department of Mechanical and Aeronautical Engineering.

Visit the website [www.up.ac.za/caim](http://www.up.ac.za/caim), for more information on this programme as well as other postgraduate study opportunities, or contact:

**George Harley**  
george.harley@up.ac.za

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## Entrance requirements and considerations

Students who have completed a BEng, BSc or BTech degree can apply for admission. Students must register with either the Department of Mechanical and Aeronautical Engineering, or with the Graduate School of Technology Management. **Prospective students must consider that there might be specific compulsory requirements of the various participating departments.** Masters degree studies will generally be continued in the department where the Honours degree was completed. Students must check lecture schedules to avoid clashes when constructing their programme.

A student will be awarded a Honours Degree, i.e. either a BEng (Hons,) or BSc (Hons) after completion of the courses, and a Masters Degree, i.e. either a MEng or MSc degree after completion of the research dissertation.

### Bursaries

Various bursary options are available to students who have proven themselves academically.

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## Further information

More details about other programmes, prerequisites, etc. can be found in the respective departmental brochures:

### Department of Civil Engineering

[www.up.ac.za/civil](http://www.up.ac.za/civil)

### Department of Industrial and Systems Engineering

[www.up.ac.za/ie](http://www.up.ac.za/ie)

### Department of Mechanical and Aeronautical Engineering

[www.up.ac.za/me](http://www.up.ac.za/me)

### Graduate School of Technology Management

[www.up.ac.za/gstm](http://www.up.ac.za/gstm)



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