

DEPARTMENT OF MECHANICAL AND MECHATRONIC ENGINEERING

Stellenbosch University

PROGRAMME OUTLINES 2019

PhD (*Engineering*)
MEng Research (*Mechanical Engineering*)
MEng Research (*Mechatronic Engineering*)
MEng Structured (*Mechanical Engineering*)
Pg Dip in Engineering

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DEPT M&M ENGINEERING HOMEPAGE www.sun.ac.za/mecheng

Stellenbosch University: <http://www.sun.ac.za>

Engineering Faculty: <http://www.eng.sun.ac.za>

Postgraduate and Admission Committee

(At least two members other than the supervisor must be professors):

- Postgraduate Coordinator
- Departmental Chairman
- Dissertation/thesis/project supervisor
- One other academic staff member

Departmental Management Committee

- Departmental Chairman
- Heads of the Department's Divisions
- Postgraduate Coordinators
- Other staff invited by the HOD

LOCATION:

Please note the Department has moved to the new decanting area since the middle of October 2018, opposite the Stellenbosch Traffic Department – entrance Joubert Street.

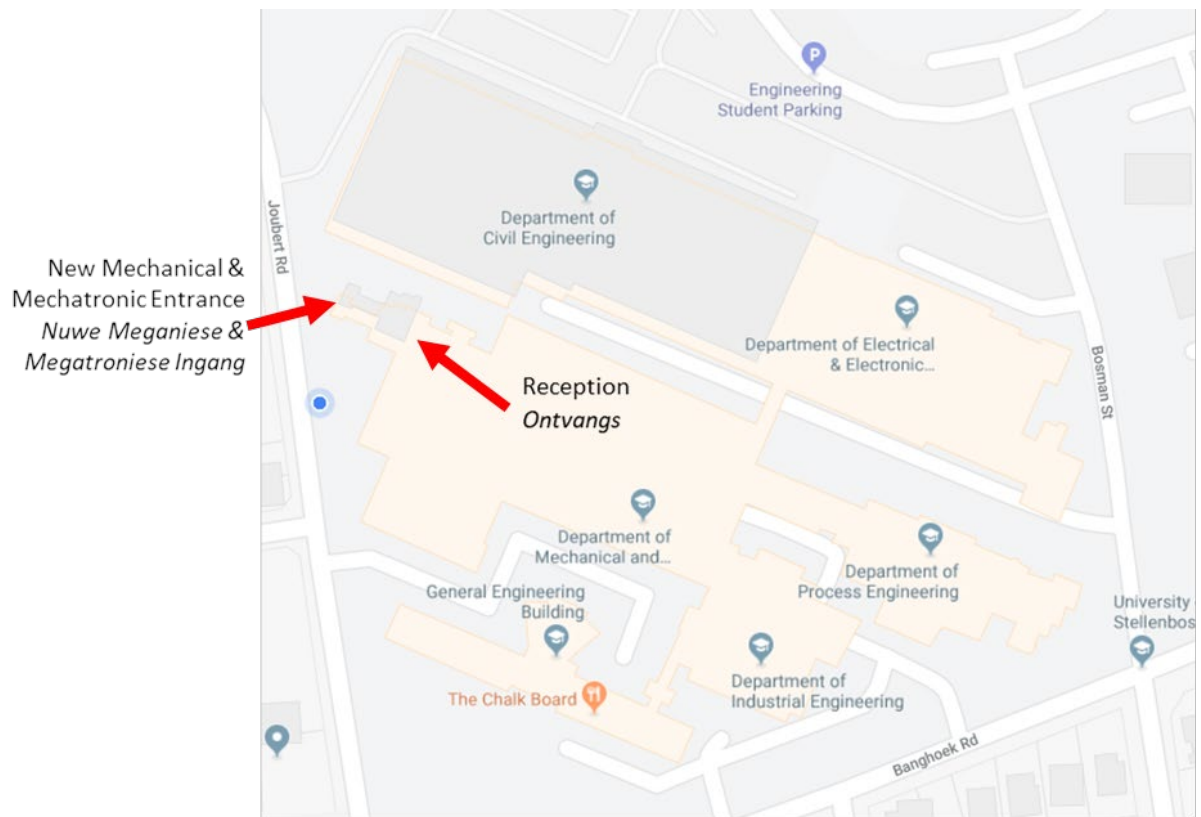


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1. Overview

The table below summarises some of the main distinctions amongst the postgraduate programmes offered by the Department.

Postgraduate Diploma in Engineering	Master of Engineering (Structured)	Master of Engineering (Research)*	Doctor of Philosophy
Pg Dip in Eng	MEng Structured	MEng Research	PhD
A 100 % coursework based programme, typically following after a BEng degree, requiring two semesters of study if done full time.	A coursework based programme with a composition of approximately 67 % coursework and 33 % project, typically following after a BEng degree, requiring 12 months of study if done full time.	100 % research based programme with an element of compulsory supplementary coursework, typically following after a BEng degree, requiring two years of study if done full time.	100 % research based programme, typically following after an MEng Research degree, requiring three years of study if done full time.
Refer to Appendix B for an abbreviated outcomes statement for the two MEng programmes			

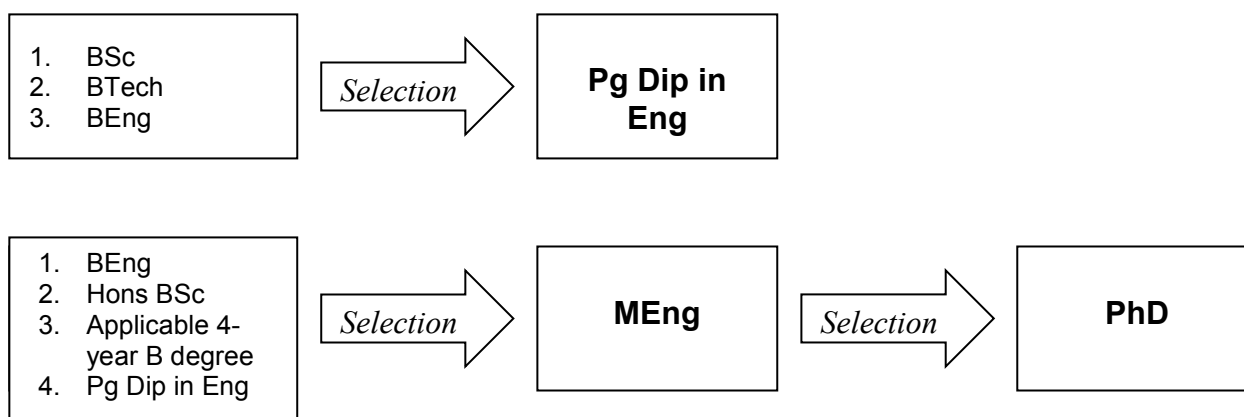
** Note that the MScEng programme, used until 2011, is equivalent to the MEng Research programme*

This document is intended to provide prospective and current students with the information about these programmes that is specific to the Department of Mechanical and Mechatronic Engineering.

2. Admission and selection requirements

2.1. Overview

Before a student can register for one of the programmes considered here, the student must first pass the selection process in the department and then submit an application for admission. The relevant details of the selection process are discussed here. Applications for admission are best submitted via the university's website.



The figure above illustrates some key features of the selection requirements. The requirements given here are the minimum requirements, but do not guarantee being accepted. The Admission Committee considers applications for selection and may consider applications that do not meet the normal selection requirements, but demonstrate in another way a similar level of competence. If the Admission Committee decides that an application meets the selection requirements, its decision is communicated to the Faculty Secretary at the office of the Registrar, where the student's application for admission is then processed.

2.2. Admission and selection for PhD

Admission to the PhD programme is treated in two phases: firstly selection and admission to the first year of study; and secondly, permission to continue after the first year of study. It should be noted that selection and admission to the first year of study grants access to the candidacy phase only and does not automatically imply permission to continue beyond the first year.

To apply for selection for the PhD programme, the student must submit to the Postgraduate Administrator transcripts of his/her academic record (listing courses/modules completed and the corresponding grades awarded, as well as qualifications completed) and upon approval, an *Initial Application & Departmental Admission Form for Postgraduate Study*. A prospective student that has not completed a research-based masters degree in South Africa, must also demonstrate his/her research ability, for example by submitting a pdf copy of a masters thesis and/or research papers reporting research work done by the student.

To be accepted into the PhD programme, the members of the Department's Admission Committee must decide unanimously that:

- The student has demonstrated that he/she has the required background knowledge and research ability.
- The research area is suitable for doctoral studies (note that the specific topic and intended original contribution need not be described in detail for the selection process, but it must be clear that the research area will provide sufficient scope for original work by the student).
- The research is sufficiently within the areas of expertise of the supervisor(s).
- It is reasonable to expect that the infrastructure required for the research, will be available.
- Approval is subject to the discretion of the Department.

The particular requirements to continue from the first to the second year of the PhD programme are outlined in the section "Continuation Requirements".

2.3. Selection for MEng Research and MEng Structured

To apply for selection for one of the MEng programmes, the student must submit to the University of Stellenbosch (apply online) transcripts of his/her academic record (listing courses/modules completed and the corresponding grades awarded, as well as qualifications completed) and upon approval, an *Initial Application & Departmental Admission Form for Postgraduate Study* to the Postgraduate Administrator.

To apply for selection for MEng Structured, the *Initial Application & Departmental Admission Form for Postgraduate Study* must show:

- a study plan listing the modules the student intends doing.

For the MEng Research, the *Initial Application & Departmental Admission Form for Postgraduate Study* must show:

- a study plan listing the modules the student intends doing;
- a suitable thesis topic;
- the name of a thesis supervisor and co-supervisor(s) (if applicable) capable of guiding the student in the thesis research.

In cases where specialised facilities will be required for the student's thesis research, the application form must be accompanied by a description of the arrangements that have been made for access to suitable facilities.

To be accepted into a MEng Mechanical programme, a student must normally have completed a BEng or BScEng in mechanical engineering within the prescribed minimum number of years with an average of at least 60 %, calculated over the whole period, as well as an average of at least 60 % in the final year. For MEng Mechatronics, the corresponding requirements for a BEng or BScEng Mechatronics apply. Students that apply for admission with other qualifications will have to demonstrate equivalent performance and that they have the required technical background for the MEng programme that they are applying for. Such students may also be required to complete courses in addition to that normally required.

Approval is also subject to the discretion of the Department.

2.4. Selection for Pg Dip in Engineering

To apply for selection for the Pg Dip in Eng programme, the student must submit to the University of Stellenbosch (apply online) transcripts of his/her academic record (listing courses/modules completed and the corresponding grades awarded, as well as qualifications completed).

To be accepted into the Pg Dip in Eng programme, a student must normally have completed his/her undergraduate qualification within the prescribed minimum number of years. BSc graduates & BTech graduates must have achieved an average of at least 60 % over the whole period, as well as an average of at least 60 % in the final year.

Approval is also subject to the discretion of the Department.

2.5. Converting between programmes

Converting between MEng Structured and MEng Research

For conversion from the structured to the research masters, a supervisor and thesis topic must first be identified, and an *Initial Application & Departmental Admission Form for Postgraduate Study* must be completed. The student must then submit the form to the Postgraduate Administrator. If the student is accepted into the MEng Research programme, the Postgraduate Administrator will inform the Faculty Secretary. The student must submit a revised study plan to the Postgraduate Administrator within 2 weeks of the conversion.

Applications for conversion from the research to the structured Masters will be considered, subject to HEQC requirements, only if the student has not submitted a thesis to the examiners. A project supervisor and topic must first be identified, and an *Initial Application & Departmental Admission Form for Postgraduate Study* must be completed. The student must then submit the form to the Postgraduate Administrator. If the application is successful, the Postgraduate Administrator will inform the Faculty Secretary. The student must submit a revised study plan to the Postgraduate Administrator within 2 weeks of the conversion. Note that the coursework requirements of the MEng Research are less than that of the MEng Structured. Students converting to the MEng Structured will therefore probably have to do further modules.

Converting between MEng Research and PhD

While carrying out the MEng Research work or after completion of the thesis the study leader(s) and the student may come to the conclusion that the nature of the work has a significant component equivalent to PhD standard original research. In that case an application of an upgrade of the programme registration toward PhD registration may be submitted in the following two ways:

A completed MEng Research thesis is submitted for examination giving notice to the post-graduate administrator that an upgrade is sought. In this case it is a requirement that at least one of the examiners holds a PhD degree. The examination process is complete normally and only then the examination panel considers the question whether the work is indeed of such a nature that a PhD is likely to emerge in a reasonable time. If an upgrade is granted, the MEng Research thesis (e-thesis) must be nevertheless finalised and signed off by the supervisor and submitted to the PA. A research proposal must be submitted and a minimum registration period as PhD student for at least one year after two year MEng Research registration is required before a PhD thesis is submitted for examination. In this research proposal the preparation and submission of a journal paper must be prioritised in order to satisfy the requirements for the PhD degree. Should, however, during the course of this additional year or subsequent years of registration the supervisor(s) and student come to the conclusion not to proceed with the PhD programme, the original MEng Research degree can be awarded.

Alternatively, it is possible prior to the emergence of a MEng Research thesis, to apply for an upgrade to PhD studies enrolment if the study leader(s) and student come to consider this action to be appropriate. In this case at least one completed scientific paper must have already emerged from the work and been submitted for review to an accredited research journal. Furthermore, a second draft paper must have reached an advanced stage of completion to the satisfaction of the supervisor(s). Finally, a comprehensive PhD research proposal must be submitted and the student may be required to give an oral presentation to a faculty candidacy panel which is considering the application to upgrade the registration to a PhD programme. At least one further year of PhD registration would be required before the PhD thesis can be submitted for examination.

Please note any of the above should be approved by the Faculty Committee and therefore may have timing implications.

Please refer to relevant guidelines pertaining to PhD programme studies elsewhere in this guide.

2.6. Part time studies

Part time students typically have a reduced number of hours per week available for their studies and therefore take longer to complete a degree programme. They must have access to the Internet, be able to send and receive e-mail, and be able to use a Web browser for their studies. **Part time students must be able to attend lectures and examinations in Stellenbosch.** Some of the modules required in the MEng programmes are only offered on a semester basis during the first semester (i.e. with weekly contact sessions). The modules required for the Pg Dip in Eng are offered on a block basis (i.e. with one week of contact, preceded and followed by assignments).

Part time study in the thesis/dissertation parts of MEng Research and PhD programmes are only feasible in exceptional circumstances.

2.7 Changing from full time to part time studies

A student who registered initially for the degree on a fulltime basis may only request to change this registration to a part time basis in highly exceptional cases. Please submit your motivation together with your supervisor's approval to the Postgraduate Administrator before the **15th of January**.

3. Scope and assessment criteria

3.1. General requirements

- All residential postgraduate students must attend the weekly **Departmental Research Colloquium**.
- Residential MEng Structured students must serve at least four hours per week as **Student Assistants** for the undergraduate programmes for two semesters. The corresponding requirement for residential MEng Research students is four semesters, and for residential PhD students five semesters.
- Every assessment submitted by a student that was not done under supervision arranged by the Department, must be accompanied by the following **declaration** "I declare that the entirety of the work contained herein is my own, original work", with the student's signature and a date.
- **Plagiarism** will not be tolerated at all. Any assessment in which an instance of plagiarism is identified, will be given zero as a mark and the matter will be handled according to the University's policy on plagiarism. Note that self-plagiarism is also unacceptable; this includes unreferenced re-use of one's own articles and previous assignments.

Lecturers may, at their discretion, require students to submit assignments on Turnitin (though SunLearn).

- **Verbatim copying** of any significant amount of information from any published sources, even with appropriate acknowledgement of the sources, is unacceptable and if found in assignments, the mark for that assessment will be substantially reduced. Students will only be given marks if they have at least interpreted, integrated or applied published work.
- **Extensions to deadlines** for submitting assessments (e.g. assignments) may not exceed one week and may be granted by the relevant lecturer, at his/her sole discretion, if a student applies for it in writing before the original due date and submits valid reasons which indicate exceptional and unforeseen circumstances. Extensions to centrally scheduled assessments, e.g. examinations, will not be granted.

3.2. PhD

Scope

The PhD programme normally only contains research (i.e. it has no compulsory coursework) and takes three years to complete. Students may, however, be required to complete supplementary coursework, at the discretion of the Admission Committee and supervisor.

All PhD students must have submitted at least one journal article to an international journal for publication by the time the student's PhD dissertation is submitted for examination. All PhD students must also submit another journal article, of acceptable standard for an international journal (hard and electronic copies), to the Postgraduate Coordinator at or before the oral examination. The subject of the articles, whether the articles are submitted for publication and where they are submitted, will be decided by the supervisor(s). Note: Should

the dissertation be classified as confidential or secret, the articles must be submitted to the supervisor(s), who will decide whether and when the articles will be submitted to journals.

Every PhD student must submit a dissertation, on one central and coherent research question, reflecting Mechanical/Mechatronic Engineering research of the student of at least 3600 hour duration (360 credits). The body of the dissertation may comprise either:

- An introduction, a number of chapters and a conclusion, or
- An introduction, a number of published or unpublished papers and a conclusion, or
- An introduction, a combination of chapters and published or unpublished papers, and a conclusion.

If papers are included as part of the body of the dissertation, students must refer to the relevant sections in Part 1 of the University Calendar for further instructions.

The dissertation must comply with the Department's formatting requirements, adhere to the Department's *Guide for Writing Technical Reports* and satisfy all the requirements given in Part 1 of the University Calendar. The dissertation may not exceed 200 pages, between covers, i.e. introductory (contents) pages and appendices included. A CD with additional information may be included at the back of the document, but the examiners must be able to assess the student's work without referring to the CD.

Every PhD student shall undergo an oral examination on his/her dissertation (the student must attend the oral examination in person) and is also required to deliver a colloquium (public research presentation) on his/her research in the Department.

Workshops:

Compulsory participation on the Faculty PG Writing Integrity Module (PGWIM) or acceptable and approved equivalent is required.

Writing course vs Research Methodology vs PG Writing Integrity Module (PGWIM)
What should you attend in 2019?

	Registration	Writing Course 2 courses/yr	Research Methodology semester module	Completion of PG Writing Integrity Module (PGWIM) Online by 31st of March
PhD FT & PT	2017 or earlier			*
	2018			*
	2019			*

* = compulsory attendance

If attended a similar course previously, present proof and you may request for exemption

Assessment criteria

The student must submit his/her own work in a dissertation that reflects:

- The extent to which the dissertation makes an original contribution to knowledge in its field. Related to this, the extent to which the dissertation or part of it is publishable in a peer-reviewed research journal.
- Adequate command of the relevant research method.
- Familiarity with the relevant literature.
- The ability to interpret research results.
- Clear and systematic presentation of the material and logical exposition of the argument.
- Proper documentation and support of the results of independent research.
- Acceptable linguistic and stylistic presentation.

Each examiner submits a report commenting on the above and has to return one of the following verdicts:

- Accept the dissertation as is,
- Editorial changes to the satisfaction of the supervisor are required,
- Factual or textual changes to the satisfaction of the examiners are required,
- Substantial revision of the dissertation and resubmission to the examiners are required, or
- The dissertation is rejected without the opportunity to improve it.

Final mark calculation

No mark is awarded, only a pass or fail.

3.3. MEng Research Mechanical and MEng Research Mechatronics

3.3.1. Compulsory Supplementary Coursework

Scope

Students are required to complete the following set of modules:

- One postgraduate Mathematics or Applied Mathematics module of 15 credits.
- Two advanced 800-level mechanical or mechatronic engineering modules of 15 credits each.
- Two further modules, in any of the four categories, of 15 credits each. One of these modules can be substituted with a self-study module if the necessary theory for the student's thesis is not available in modules offered in the relevant year. Self-study modules are also subject to formal assessment.
Note: This requirement will be modified from beginning 2018 by the introduction of a compulsory research methodology module in lieu of one of these modules.
- No Renewable and Sustainable Energy (RSE) block courses may be taken.

A 15 credits module nominally requires 12 h of study per week (contact time included) for one semester.

Students may apply to the Postgraduate Committee for recognition of modules done at other departments or institutions, or as part of other degree programmes. A summary of the module content, with a clear indication of the level and scope, must be submitted for consideration at time of application. The Committee will assess whether each module is considered to be equivalent to relevant category.

In exceptional cases a student may be required to do additional modules, e.g. due to insufficient background for the chosen thesis topic.

Assessment criteria

Each student must receive a final mark of at least 50 % (if marks are awarded) or be assigned "duly performed" (if final marks are not awarded in the module) for each of the required supplementary modules. Note that the marks awarded for the modules are not taken into account when determining the student's final mark for the MEng programme. For each module's assessment criteria, please refer to the relevant module's study guide.

3.3.2. Workshops

Each student, in his/her first year of postgraduate study in the Department, must attend workshops arranged by the Department to prepare students for thesis writing. These workshops typically include strategies for literature searches and compiling an own literature database.

Further, at a time agreed to between the supervisor and student, each **MEng Research student enrolled in 2017** has to attend a Technical Writing Skills workshop at the Language Centre or a similar workshop (which must include a plagiarism avoidance component). Students who have significant postgraduate writing experience may apply, through the Postgraduate Administrator, to the Management Committee for exemption from the requirement to attend the Technical Writing Skills workshop.

MEng Research students enrolled in 2018 and later must complete the compulsory Research Methodology module as one of the 5 required modules.

Writing course vs Research Methodology vs PG Writing Integrity Module (PGWIM)

What should you attend in 2019?

	Registration	Writing Course 2 courses/yr	Research Methodology semester module	Completion of PG Writing Integrity Module (PGWIM) Online by 31st of March
MEng R FT & PT	2017 or earlier	*		
	2018		*	
	2019		*	*

* = compulsory attendance

If attended a similar course previously, present proof and you may request for exemption

3.3.3. Research

Scope

Every MEng Research student must submit a thesis, on one central and coherent research question, reflecting Mechanical/Mechatronic Engineering research of the student of at least 2400 hour duration (note that the credit allocation to the MEng Research programme does not reflect the amount of work normally required to complete this programme). The thesis must show clearly that the student is able to do independent scientific and technical investigations, and to interpret the results.

The thesis must comply with the Department's formatting requirements, adhere to the Department's *Guide for Writing Technical Reports* and satisfy all the requirements given in Part 1 of the University Calendar. The thesis may not exceed 80 pages from the introduction to the conclusion of the thesis, and an additional 40 pages for appendices. A CD with additional information may be included at the back of the document, but the examiners must be able to assess the student's work without referring to the CD.

Each student must also submit a journal article, of acceptable standard for an international journal, to the Postgraduate Coordinator at or before the oral examination. The subject of the article, whether the article is submitted for publication and where it is submitted, will be decided by the supervisor(s). Note: Should the thesis be classified as confidential or secret, the article must be submitted to the supervisor(s), who will decide whether and when the article will be submitted to a journal.

Every MEng Research student shall undergo an oral examination on his/her thesis (the student must attend the oral examination in person) and is also required to deliver a colloquium (public research presentation) on his/her research.

Assessment criteria

The student must submit his/her own work in a thesis that reflects:

- Mastering of the relevant field of study (research need not necessarily be original for a Master's thesis, as for doctoral studies).
- Adequate command of the relevant research method.
- Familiarity with the relevant literature.
- The ability to interpret research results.
- Clear and systematic presentation of the material and logical exposition of the argument.
- Proper documentation and support of the results of independent research.
- Acceptable linguistic and stylistic presentation.

Each examiner submits a report commenting on the above, recommends a mark (at least 50 for pass, at least 75 for distinction) and has to return one of the following verdicts:

- Accept the thesis as is,
- Editorial changes to the satisfaction of the supervisor are required,

- Factual or textual changes to the satisfaction of the examiners are required,
- Substantial revision of the thesis and resubmission to the examiners are required, or
- The thesis is rejected without the opportunity to improve it.

3.3.4. Final mark calculation

Subject to completion of the required supplementary modules, the final mark is determined by the examiners after the oral examination. The final mark is solely based on the thesis.

3.4. MEng Structured

Only the MEng Structured in Renewable and Sustainable Energy Studies is offered.

3.4.1. Coursework

Scope

Students are required to complete the modules listed at

http://www.sun.ac.za/english/faculty/eng/mechanical-mechatronic/Documents/Postgraduate/Current%20PG/20190204%20ProgrammeForMEngStructuredStudents_2020.pdf

A 15 credits module nominally requires 12 h of study per week (contact time included) for one semester.

Students should note that the Department's postgraduate modules, other than GET and most of the RSE modules, are presented in a semester format (typically two or three lectures per week) during the course of the first semester. The RSE modules are presented in a block format in one week with 45 h of contact, which is preceded and followed by assignments. Some RSE modules are scheduled in the first semester and students doing these modules at the same time as semester-based modules, will therefore experience timetable conflicts.

Students may apply to the Postgraduate Committee for recognition of modules done at other departments or institutions. A summary of the module content, with a clear indication of the level and scope, must be submitted for consideration at time of application. The Committee will assess whether each module is considered to be equivalent to relevant category.

Assessment criteria

Please refer to the relevant modules' study guides.

3.4.2. Workshops

The Department recommends that each student, in his/her first year of postgraduate study in the Department, attend workshops arranged by the Department to prepare students for writing up their research. Further, at a time agreed to between the supervisor and student, each **MEng Structured students enrolled in 2017 & 2018** has to attend a Technical Writing Skills workshop at the Language Centre or a similar workshop (which must include a plagiarism avoidance component). Students who have significant postgraduate writing experience may apply, through the Postgraduate Administrator, to the Management Committee for exemption from the requirement to attend the Technical Writing Skills workshop.

Writing course vs Research Methodology vs PG Writing Integrity Module (PGWIM)

What should you attend in 2019?

	Registration	Writing Course 2 courses/yr	Research Methodology semester module	Completion of PG Writing Integrity Module (PGWIM) Online by 31st of March
MEng S F & PT	2017 or earlier	*		
	2018	*		
	2019		*	*

* = compulsory attendance

If attended a similar course previously, present proof and you may request for exemption

3.4.3. Project

Scope

Every MEng Structured student must submit a project report, on one central and coherent research question, reflecting Mechanical/Mechatronic Engineering research of the student of at least 600 hour duration (60 credits). The project may be done in industry and the nature of the project must be that of a small research project that contains advanced theoretical and practical elements.

The project report must comply with the Department's formatting requirements and adhere to the Department's *Guide for Writing Technical Reports*.

The report may not exceed 60 pages from the introduction to the conclusion and the appendices may not be more than 30 pages. If necessary, detail information such as manufacturing drawings, data sheets, etc may be included in a project file, but not in the report. Also, a CD with additional information may be included at the back of the document, but the examiners must be able to assess the student's work without referring to the CD or project file.

Assessment criteria

The student must submit his/her own work in a project report, which will be assessed using the following criteria:

- The demonstrated ability to judiciously apply advanced technical methods to reach the project's objectives.
- The demonstrated ability to suitably combine theoretical and practical elements.
- The demonstrated personal initiative and advanced skill with respect to problem solving, acquiring information, drawing sensible conclusions and applying sound judgements in the course of the project.

3.4.4. Final mark calculation

At least 50 % must be achieved for each of the required modules, as well as the project. The final mark is the average of the modules and the project, weighted according to their credits.

Note that a student will normally not be given the opportunity to improve his/her MEng Structured project report once it has been submitted for examination. If a student does not receive 50 % for the project, he/she would have to do a new project, but remains subject to the maximum time allowed for enrolment.

3.5. Pg Dip in Engineering

Only the Pg Dip in Eng in Renewable and Sustainable Energy Studies is offered.

3.5.1. Coursework

Scope

Students are required to complete the modules listed at

[http://www.sun.ac.za/english/faculty/eng/mechanical-mechatronic/Documents/Postgraduate/Current%20PG/20190204%20PGDip\(RenewableEnergy\)_2020.pdf](http://www.sun.ac.za/english/faculty/eng/mechanical-mechatronic/Documents/Postgraduate/Current%20PG/20190204%20PGDip(RenewableEnergy)_2020.pdf)

The RSE modules are presented in a block format in one week with 45 h of contact, which is preceded and followed by assignments. The total workload (including contact time) is 150 h per 15 credit module.

Students may apply to the Postgraduate Committee for recognition of modules done at other departments or institutions. A summary of the module content, with a clear indication of the level and scope, must be submitted for consideration at time of application. The Committee will assess whether each module is considered to be equivalent to the relevant category.

The Pg Dip in Eng programme is not aimed at preparing students for the master's programmes.

Workshop:

Compulsory participation on the Faculty Plagiarism Avoidance Workshop (PAW) or acceptable and approved equivalent is required.

Writing course vs Research Methodology vs PG Writing Integrity Module (PGWIM)

What should you attend in 2019?

	Registration	Writing Course 2 courses/yr	Research Methodology semester module	Completion of PG Writing Integrity Module (PGWIM) Online by 31st of March
Pg Dip FT & PT	2017 or earlier			*
	2018			*
	2019			*

* = compulsory attendance

If attended a similar course previously, present proof and you may request for exemption

Assessment criteria:

Please refer to the relevant modules' study guides.

3.5.2. Final mark calculation

At least 50 % must be achieved for each of the required modules. The final mark is the average of the modules, weighted according to their credits.

4. Continuation requirements

4.1. Study Plan, Study Agreement and Thesis Proposal

All students are required to compile a Study Plan before admission, as contained in the Departmental Postgraduate Application Form. The Study Plan must be completed in consultation with the thesis/dissertation supervisor for research-based programmes. The Study Plan must show all the modules that are to be used to determine whether the student has met all the requirements for graduation and for the student's final mark.

The **Study Plan** may be amended only with the approval of the supervisor (for MEng Research and PhD students) and the Postgraduate Coordinator.

The **Study Agreement** (required for MEng Research and PhD students) based on the example in Appendix C must be submitted to the Postgraduate Coordinator within one month of commencing studies. The Study Agreement for MEng Research and PhD students must indicate the date by which the Thesis Proposal (for MEng Research) or Research Proposal (for PhD) will be submitted.

By the date indicated in the Study Agreement, a MEng Research student must submit to the Postgraduate Coordinator a **written thesis proposal** that has been approved by his/her supervisor. The proposal must include an exposition of the objectives and planning of the project or thesis. Thesis proposals must also include a literature review and an overview of the thesis work completed to date (detailed guidelines for thesis proposals are given in an appendix of the third edition of the Guide for Writing Technical Reports).

Once the Postgraduate Coordinator has accepted the thesis proposal, the proposal forms an integral part of the student's Study Plan.

For further details regarding the PhD Research Proposal, please refer to the section, below, that describes the PhD Candidacy.

4.2. The maximum time of enrolment allowed

Students must take note of the maximum time allowed for enrolment as indicated below. Re-registration after the maximum time requires the permission of the Faculty Committee and will be granted only in exceptional circumstances.

Key	
	Normal duration of degree
	Final additional year
	Subject to granting of re-admission: students will be granted permission to reregister only in unusual circumstances
	Not applicable

Pg Dip in Eng [120 SAQA credits]				
Year of Enrolment	1	2	3	4
Full-time Enrolment			X	
Part-time Enrolment				X

MEng Structured [180 SAQA credits]					
Year of Enrolment	1	2	3	4	5
Full-time Enrolment			X		
Part-time Enrolment					X

MEng Research [180 SAQA credits]						
Year of Enrolment	1	2	3	4	5	6
Full-time Enrolment				X		
Part-time Enrolment						X

PhD [360 SAQA credits]								
Year of Enrolment	1	2	3	4	5	6	7	8
Full-time Enrolment					X			
Part-time Enrolment								X

PROCEDURE FOR THE RE-ADMISSION OF POSTGRADUATE STUDENTS WHO EXCEED THE MAXIMUM TIME ALLOWED TO GRADUATE

Master's and doctoral students who, at the end of the current year, exceed their maximum permissible period within which to graduate in that year, are warned via email by the Faculty Secretary in June of that year that they will not be able to automatically register for the next academic year.

Qualifying masters and doctoral students are informed via e-mail by the Faculty Secretary in November that, in the following year, they will exceed their allotted time within which to graduate, and that they cannot continue their studies without first obtaining permission from the department concerned. The list of students is sent to the relevant department's Postgraduate Coordinators, Departmental Chairs and the Vice Dean (Research).

The students concerned must submit documents for re-admission to the Office of the Departmental Chair by 15 January, for consideration by a departmental committee / management committee.

The departmental recommendations (with motivation) regarding the re-admission of master's students are sent by 31 January to the Vice Dean (Research) for final approval, after which it is sent to the Faculty Secretary, who will then officially inform the students regarding the Faculty's decision.

The departmental recommendations (with motivation) regarding the re-admission of PhD students are sent to the Faculty Secretary, with copies sent to the Vice Dean (Research). The recommendations must reach the Faculty Secretary by the closing date of the Faculty Committee's agenda, so that it can serve at the first Faculty Board meeting in February.

4.3. PhD candidacy and continuation from first to second year

PhD students' admission to the first year does not automatically allow continuation after the first year. To be allowed to continue after the first year of registration, the following procedures will apply (in order to mitigate the risk associated with a long duration PhD program):

- 4.3.1. The PhD candidate must submit, typically within 6 to 9 months after first registration and taking into account the deadlines given below, a written research proposal at the home department's departmental chairperson (or delegate). It is the student's responsibility to ensure that the research proposal is submitted early enough.

The research proposal should typically be 20 to 30 pages long and must adhere to the instructions given in Appendix E.

- 4.3.2. If the supervisor(s) is responsibly able to form an opinion that further evaluation of the candidate and research topic is unnecessary (for example where the candidate's abilities have been demonstrated in previous study, and the research topic is part of an established research area of the supervisor), then the supervisor can submit a brief motivation for continuation of the PhD studies to the Departmental Chairperson and the Vice-dean: Research (or their delegates). If they support it, then only the motivation and their recommendation is submitted to the Faculty Committee.

Otherwise, typically two to four weeks after a candidate has submitted the research proposal, his/her suitability to continue with PhD studies is assessed by a candidacy panel. The candidacy panel comprises the supervisor(s), at least one person appointed by the home department's chairperson and

at least one person appointed by the Vice-dean: Research. At least one of the non-supervisors must be from outside the home department and they should be appointed, as far as is practicable, on the grounds of their technical knowledge of the research area. The candidacy panel's evaluation must be based on the following:

- The submitted research proposal.
- A presentation (of approximately 15 to 25 minutes) by the candidate about the research proposal, as well as answers of the candidate to questions from the panel on the proposal and the planned research. The candidacy panel may, if they consider the presentation to be unnecessary, waive the requirement to make a presentation, but still retain the opportunity to pose questions to the candidate about the research.
- The candidate's answers to questions posed by the panel to assess the candidate's technical expertise in the knowledge areas relevant to the research topic.

If the candidacy panel decides that small improvements to the research proposal are required, they can give the candidate a short period (normally one week) for the changes. The review of the changes must be handled as decided by the panel. The panel members must (after improvements, if applicable) each recommend whether the candidate may or may not proceed with PhD studies, and communicate this on a suitable form to the Faculty Committee.

4.3.3. If the candidacy panel unanimously recommends continuation, then their recommendation is submitted to the Faculty Board without further consideration by the Faculty Committee. If the panel members do not unanimously recommend continuation, then the Faculty Committee must submit a proposal for further handling of the matter to the Faculty Board. Examples of further handling are to refuse the student continuation of his/her studies, to add more persons to the candidacy panel and repeat the previous assessment of the candidate, or to give the candidate a period to improve his/her technical knowledge. Improvements to the research proposal will normally not be allowed and a candidate will normally be granted no more than one opportunity to improve and not more than one semester for that. The latest date that the improvements may be submitted should be part of the Faculty Committee's recommendation to the Faculty Board.

4.3.4. If the Faculty Board does not approve continuation (with or without improvements) of a PhD candidate within twelve months of his/her original admission, then that candidate will normally not be permitted to continue with PhD studies. An extension to this due date will only be granted in exceptional circumstances and is subject to the approval of the candidate's home department and the Faculty Board. No distinction will be made, regarding the due dates, between full time and part time students¹. In cases where the Faculty Board had decided that improvements were required, but continuation had not been approved by the Faculty Board by the due date associated with the improvements, then the candidate will not be allowed to continue with PhD studies.

4.4. Annual satisfactory progress requirements

According to the general rules of the university, the Chairman of the Department (usually aided by the Post Graduate Coordinator) has to confirm that a postgraduate student has made satisfactory progress before the student will be allowed to register for the second or following years, up to the maximum allowed period. Permission to register after the maximum period can only be granted by the Faculty Committee and will be given only in exceptional cases.

Although special circumstances will be considered by the Chairman, the following are typical measures that will be applied when assessing whether a student's progress is satisfactory:

- Part time MEng Structured students are expected to pass at least three modules per year. They must also be able to complete the MEng Structured programme in the remaining time by passing no more than 4 modules per year and only doing their MEng Structured project in the last year allowed.
- Full time MEng Structured students are expected to pass at least seven modules per year.
- Full time MEng Research students are expected to pass at least four of the required supplementary study modules in the first year.
- Any student that does not complete a module within two attempts will be considered to be making unsatisfactory progress.

4.5. Interruption of studies

Unless the Faculty Board's prior approval has been obtained to interrupt registration, students must reregister every year from first acceptance into the particular postgraduate programme until graduation. Graduation in the March graduation ceremony requires being registered for the preceding calendar year.

Students (particularly part time students) whose circumstances prevent them from expecting to make satisfactory progress in a given year can apply to the Faculty Board for an interruption of studies before the start of that year. Such an interruption can only be awarded once and an appropriate motivation for the application is required. University fees are not levied in the year of interruption, and the maximum allowed period for completion of the programme will be extended by one year.

4.6 Discontinuation of studies

Refer to the General US Calendar Section 10 (2019)

Inform your supervisor in writing as well as the Faculty Secretary (PhD students) or Faculty Admin Officer (M & Pg Dip in Eng students) and the Department's PG Admin Officer.

5. Examination of projects, theses and dissertations

For the sake of brevity, in this section "thesis" should be taken to include PhD dissertations, MEng Research theses and MEng Structured project reports. Further, "Postgraduate Coordinator" and "Postgraduate Administrator" should be taken to include persons acting on their behalf or assigned the relevant duty by the Departmental Chairperson.

Thesis requirements:

Requirements for PhD candidates are clearly stipulated in Section 6.9 of the chapter on Postgraduate Qualifications in Part 1 of the University Calendar. Further department-specific requirements are as follows:

- If published and/ or unpublished articles, are included in the thesis, they must be in the standard format as prescribed by the Department (refer to Technical Writing Guide). In cases where published articles are cited (i.e. not included) in the thesis, copies of these papers must be submitted with the thesis for examination.
- Thesis must be coherent and examinable which must be checked and approved by the supervisor before submission.
- Postgraduate coordinators must be informed beforehand if papers will be included in theses.

Article based MEng Research theses are not allowed.

5.1. Notification of the intent to submit and preparing the thesis for submission

Students must inform their supervisors of their intention to submit their theses at least four months before the planned submission date. Students must keep in mind that supervisors may require at least a few weeks to review their draft theses and that the changes required by the supervisors typically take the students more than one week to complete. The period required by supervisors to review a student's thesis will be even greater if the supervisor has multiple students submitting at the same time.

Theses will, except in exceptional circumstances, only be submitted to the examination process after the supervisor has given his/her consent. Two situations that could lead to examination of the thesis without the supervisor's consent are:

- A student may insist on submitting a theses for examination without the supervisor's consent.
- A supervisor will normally review a student's thesis (and give feedback to the student) no more than twice. If a supervisor judges the student's thesis to still not meet the required standard for submission after two rounds of feedback by the supervisor and improvement by the student, then the examiner may (at his/her sole discretion) withhold consent and further supervision of the student. The student can then either withdraw from the relevant programme or insist on submitting the theses for examination without the supervisor's consent.

If a thesis is submitted without the supervisor's consent, the examiners will be instructed not to assume that the thesis being examination has the supervisor's approval.

If a time for a PhD and MEng Research student's public colloquium has not already been set, the student must inform the Postgraduate Administrator of this at least two months before the planned submission date.

5.2. Appointment of examiners or moderators

Having received notice of a student's intention to submit a thesis, the supervisor (note: not the student) must nominate potential internal examiners (for all document types), external examiners (for theses and dissertations) and external moderators (for project reports) using the Faculty's prescribed form. The external examiners' or moderators' CV's should be attached. The nominations are considered by the Postgraduate Committee, then the Faculty Committee and are appointed by the Faculty Board.

At least one internal examiner (normally a member of the Faculty Board) and one external moderator must be nominated for MEng Structured projects. The supervisor(s) also act(s) as examiners for MEng Structured projects. For MEng Research theses, one internal examiner (normally a member of the Faculty Board) and one external examiner must be nominated, and preference is given to overseas experts as external examiners. Usually, only examiners with at least a master's degree are considered for appointment as examiner for MEng Research and MEng Structured students. At least three examiners must be nominated for PhD dissertations, and at least two of the examiners must be external. At least one of the external examiners should normally be an overseas expert. Usually, only examiners with a PhD degree are considered for appointment as examiners for PhD students.

The examiners must be independent, i.e. they may not have participated in the inception of the project/research or in guidance of the student, they must have no significant financial involvement in the outcome of the examination process and there must be no family or social friendship relationship between the examiner and the student.

Note that there may be no direct contact or correspondence, relating to the dissertation/thesis/ project, between the student and the examiners, nor between the supervisor and the examiners, during the examination process.

5.3. Initial examination steps for dissertations, theses and project reports

Note that, as stated before, in this section "thesis" should be taken to include PhD dissertations, MEng Research theses and MEng Structured project reports. Further, "Postgraduate Coordinator" and "Postgraduate Administrator" should be taken to include persons acting on their behalf or assigned the relevant duty by the Departmental Chairperson.

The following paragraphs outline the first steps of the normal examination procedure that applies irrespective of the document type:

- The thesis cannot be submitted for examination before completion of all required or supplementary coursework.
- The student should complete a notification form to the Postgraduate Administrator notifying her of his/her hand-in date. The Postgraduate Administrator will send this via email towards the end of July.
- The student must ensure that the thesis exactly complies with the departmental formatting requirements. The student must also ensure that the thesis generally complies with the Department's *Guide for Writing Technical Reports* and is free of editorial and grammatical errors before submitting it for examination. Note that any thesis that does not comply with the formatting requirements will be returned to the student for correction (without any detailed feedback) and will not be reconsidered for at least 4 weeks after it was returned. If the editorial or grammatical care is unacceptable, the thesis will be returned to the student, who has to arrange to have it professionally edited at his/her own cost. The thesis will not be reconsidered without proof of professional editing.
- The student must submit a pdf and a paper copy of the thesis, in the format that he/she wishes to submit it to the examiners, to the Postgraduate Administrator, together with a note from the supervisor(s) indicating their consent or their decision to withhold consent.
- The student also submits the thesis to Turnitin and the Postgraduate Administrator receives a notification via email, prints the report and the Postgraduate Coordinator reviews the Turnitin report. If evidence of plagiarism is found, the document will be rejected outright and the matter will be referred to the Central Disciplinary Committee.
- The Postgraduate Coordinator first reviews the thesis for compliance with the departmental formatting requirements and editorial care. Note the penalties mentioned above for theses that are found to be unacceptable. A student will be granted only one opportunity to improve the formatting and editorial care.

If, after the opportunity for improvement, the document is still unacceptable, it will be submitted to the examiners and moderators with a note from the Postgraduate Coordinator that informs them that the document does not meet the Department's requirements even though the student had been informed of this and had been given the opportunity to correct this deficiency.

- If the thesis passes the Turnitin, formatting and editorial reviews, the Postgraduate Administrator will ask the student to provide additional copies of the thesis so that a copy can be sent to each examiner and moderator.
- Upon receipt of the copies, the Postgraduate Administrator prepares the normal covering letters for the Postgraduate Coordinator's signature and sends the theses with covering letters to the examiners by courier.

5.4. Examination procedure for MEng Structured Project Reports

After the initial examination steps given above, the further steps of the examination procedure are:

- The supervisor(s) and the internal examiner are asked in the covering letters to complete their examination of the report in four weeks.
- When the Postgraduate Administrator has received the examination reports from the supervisor(s) and internal examiner, a copy of the project report and the examination reports from the supervisor(s) and the internal examiner are sent by courier to the external moderator for consideration.
- The external moderator is asked to complete the moderation in four weeks.
- When the Postgraduate Administrator has received the moderator's report, this report is submitted to the Postgraduate Coordinator, together with the examiners' reports. If the reports' recommendations are closely aligned, the external moderator's recommend mark is noted as the final mark for the student's project. If there are significant differences of opinion between the reports, the reports are tabled at the department's Management Committee who makes a final decision about the mark to be awarded to the student's project. If a supervisor or examiner is also a member of the Management Committee, they do not take part in the final decision about the student's project mark.
- Students are not offered the opportunity to improve a report. If the student is awarded a mark of less than 50 for the project, he/she is given only one further opportunity to do a new project and submit a new report, but remains subject to the maximum time allowed for enrolment.

5.5. Examination procedure for MEng Research Theses and PhD Dissertations

After the initial examination steps given above, the further steps of the examination procedure are:

- The internal and external examiners are asked in the covering letters to complete their examination of the report in six weeks.
- The supervisor(s) are given the opportunity to submit reports commenting on the amount of guidance given to the student, the student's general performance and circumstances imposed on the student that may have constrained his/her performance. This report must be submitted to the Postgraduate Administrator before the supervisor(s) are given access to the examiners' reports.
- When the Postgraduate Administrator has received the examination reports from the examiners, the reports are submitted to the Postgraduate Coordinator. If the reports' recommendations are closely aligned and if the examiners require at most changes to the satisfaction of the supervisor(s), the Postgraduate Administrator starts with the arrangements for the oral examination.
- If more extensive revisions are required by the examiners, the student will be required to first complete the revisions and resubmit the thesis to the supervisor(s). Once the supervisor has approved the changes, the revised thesis must be submitted to the Postgraduate Administrator for re-examination. The time required for this process may require that a student register for another academic year. When the Postgraduate Coordinator is satisfied that the examination process may continue, the arrangements for the oral proceed.
- If the examiners give their consent, their reports (without making their identity or, for MEng, recommended marks known) are made available to the supervisor, who may provide copies to the student.
- At the oral examination, an independent non-examining chairperson (appointed by the Postgraduate Coordinator) presides over a meeting of the examiners, supervisor(s) and student. Out-of-town examiners normally participate by way of telephone conference. The student must attend the oral examination in person. The oral examination normally uses the following process:

- The chairperson confirms that the student has met the requirements regarding preparing and/or submission of journal articles from the thesis research.*
- The student presents a 20 minute oral presentation open to the public.
- The examiners then pose questions in camera to the student and consider his/her answers. The supervisor(s) are not allowed to participate in the questions or answers.
- When the examiners have no further questions, the student leaves the room. The chairman reads the supervisor report(s) to the examiners to place the research into context with respect to aspects such as the amount of work done, independence, unique contributions, etc., which the supervisor(s) can expand on. The examiners then have the opportunity to pose questions to the supervisor.
- When the examiners have no further questions for the supervisor(s), the supervisor(s) leave(s) the room and the chairperson gives the examiners the opportunity to amend the recommendations in their earlier reports.
- The chairperson then attempts to help the examiners reach a consensus recommendation (and final mark for MEng Research theses). If consensus is reached, the corresponding decision is noted and made known to the student and supervisor(s), with the warning that the result is subject to approval by the Department's Management Committee, the Faculty Board (for all PhD results) and the University Senate.
- If the examiners cannot reach consensus, their reports are referred to the Department's Management Committee who decides on further procedures (typically appointing further examiners).
- If the MEng thesis is of exceptional quality, and there is indication that the work done during the masters study lends itself to continuation of the work, the candidate may be offered the possibility to upgrade his or her Masters to a PhD after additional work has been completed.

For this, two routes are possible:

- The candidate goes through the normal MEng procedure, a mark is awarded, but the MEng degree is not awarded. Instead, the MEng thesis may be upgraded to a PhD, should the examination committee be in unanimous agreement (this is the preferred route). If the study leader expects this to happen, the post-graduate coordinator shall be informed a priori, and it is the responsibility of the study leader to ensure that at least one of the examiners (preferably both) hold a PhD. The normal process for enrolling in the PhD program outlined in [4.3](#) shall then apply.

In the above case it is understood that if the option to upgrade is chosen, but a PhD thesis is not completed within a reasonable time, the student will receive a MEng degree with the grade awarded during the initial examination. In addition however, an additional year of residency is required.

- Alternatively, the MEng thesis needs not be submitted for examination if the study leader is of the opinion that the work is of such quality that it could be upgraded. In this case the Management committee shall appoint a panel to assess the merits of the request by the study leader. If approved, the normal process for enrolling in the PhD program outlined in [4.3](#) shall then apply. Else, the MEng thesis should be completed for submission and examination towards the MEng degree.

- In the case of a favourable decision by the examiners, the student must complete the required changes to the thesis, and submit the final version (e-thesis) in the prescribed pdf format to the Postgraduate Administrator at least **two weekdays** before the due date for the relevant graduation ceremony. If the supervisor(s) so require, the student must also arrange, through the printers appointed by the University, for obtaining a bound paper copy for each supervisor at the student's cost.

6. Duties of supervisors and students

The duties of the supervisor are:

- To be readily available for appointments with the student, at least 1 hour per fortnight, except when on leave. When the supervisor is on research or study leave, he/she will make arrangements for continued study guidance.
- Give regular guidance and feedback to the student about formulation of objectives, literature, methodology and progress.

- Make arrangements for equipment and operating costs that is required by the student for his/her research, unless the research topic was suggested by the student.
- Require of the student no more than 9 hours per week (averaged over a semester) of work not directly related to his/her coursework and research. The time that a student serves as assistant in undergraduate courses is included in this total.
- Attempt to provide a workplace for full time MEng Research and PhD students (such as in an office or in a laboratory).

The responsibilities of the student are to:

- Regularly meet with the supervisor in Stellenbosch, irrespective of whether a full time or part time, residential or non-residential student.
- Do his/her best to finish the programme in the minimum period.
- Repay all bursaries and assistantships that were arranged by the supervisor if the programme is not successfully completed.
- If a full time student, undertake no part time work, assistantships or academic activities unrelated to the programme, until the programme has been completed, without the express permission of the supervisor.
- If a full time student, work 60 hours per week on coursework, research and assistantships.
- Use all equipment, instrumentation, experimental set-ups and laboratories with care and good judgement.
- Scrupulously comply with all the terms and conditions set out in the Study Guide for the postgraduate programme, as well as Parts 1 and 11 of the University Calendar.
- If a residential student, attend the Department's weekly research lectures

Appendix A: Due dates

The following due dates are applicable. The Study Agreement, which fixes the dates of some events, constitutes an agreement between the student and the supervisor.

Note that all documents intended for the Postgraduate Coordinator must be submitted through the Postgraduate Administrator.

Study Agreement - Appendix C: (1 st yr MEng Research & PhD)	28 February
Thesis Proposal (all M & Special M-students completing the Research Methodology module in 2019 – Final document approved by supervisor/s to them via email)	17 May 2019
Thesis Proposal – Appendix E: (1 st yr PhD)	
Full-time students:	31 July
Part-time students:	2 September
July registrations (special students only):	28 February
Progress Assessment - Appendix D: (ALL registered MEng Research & PhD students NOT graduating Dec 2019 / March 2020)	31 October
<hr/>	
Examination Procedure Session: 2019/2020 (Compulsory to all students submitting in Aug/Sept & Nov)	31 July
December Graduation 2019: <i>The submission dates include the grammar and layout check</i>	
PhD Dissertation submission to examiners	12 August
PhD Dissertation examined and approved to library	25 November
MEng Research Thesis & MEng Structured Project submission to examiners	6 September
MEng Research Thesis examined and approved to library	25 November
PhD Oral dates (please make sure you are available on all <u>3</u> days)	9-11 October
MEng Research Oral dates (please make sure you are available on all <u>4</u> days)	11-14 November
<hr/>	
March Graduation 2020: <i>The submission dates include the grammar and layout check</i>	
PhD Dissertation submission to examiners	15 November
PhD Dissertation examined and approved to library	25 February *
MEng Research Thesis & MEng Structured project submission to examiners	22 November
MEng Research Thesis examined and approved to library	25 February *
PhD Oral dates (please make sure you are available on all <u>3</u> days)	22-24 January **
MEng Research Oral dates (please make sure you are available on all <u>4</u> days)	27-30 January **
<i>(Alternative days for MEng R students in case of delays experienced with feedback from examiners)</i>	17-19 February **
<hr/>	
Graduation Ceremonies 2019:	
April 2019	3 April
December 2019	9 December
Research Methodology Block I 2020:	28-29 January
Timetable Meeting 2020:	
Students with outstanding modules should attend the timetable meeting	30 January
*Approximate date – refers to the US Calendar for exact dates	
** TBC	

Appendix B: MEng outcomes statement

MEng Research	MEng Structured
<p>Critical General Outcomes: The graduate will</p> <ol style="list-style-type: none"> 1. Have extensive knowledge of the chosen field of study. 2. Understand and master advanced theory and applications in the chosen field of study. 3. Understand and know the literature and state of research of the chosen field of study. 4. Understand the preliminary nature of knowledge. 5. Have well developed research skills. 	<p>Critical General Outcomes: The graduate will</p> <ol style="list-style-type: none"> 1. Have extensive knowledge of the chosen field of study. 2. Understand and master advanced theory and applications in the chosen field of study. 3. Be able to formulate, analyse and solve complex engineering problems. 4. Have high-level capabilities to design complex engineering systems. 5. Have integrated specialist knowledge of engineering.
<p>General Outcomes: The graduate can:</p> <ol style="list-style-type: none"> 1. Independently analyse new information and problems through application of a wide range of methods and techniques applicable to the specific problem. 2. Critically evaluate all relevant information and literature. 3. Extrapolate the implications of evaluations beyond the given. 4. Use higher order principles to analyse data. 5. Transform abstract data to an understandable form for a given goal. 6. Evaluate specific evidence that relates to critical conclusions. 7. Formulate complex problems. 8. Apply appropriate knowledge and capabilities in the solution of complex problems. 9. Compile and manipulate abstract models. 10. Use well developed research skills with authority. 11. Re-evaluate existing theories and propose new theories. 12. Handle contradictions and apply considered judgements. 13. Conduct a debate with fellow students, professional colleagues and superiors, and compile reports that are logical, considered and correct. 	<p>General Outcomes: The graduate:</p> <ol style="list-style-type: none"> 1. Has mastered at least one specialist field in engineering on advanced level. 2. Has knowledge of at least one, but preferably more, specialist fields in engineering. 3. Has mastered advanced analytical techniques. 4. Use higher order principles to analyse data. 5. Can model complex engineering systems to apply advanced analytical techniques to analyse and predict the systems' behaviour. 6. Can specify, conceptualise and design complex engineering systems. 7. Apply appropriate knowledge and capabilities in the solution of complex problems. 8. Can manage conflicting requirements and apply considered judgements in the resolution thereof. 9. Conduct a debate with fellow students, professional colleagues and superiors, and compile reports that are logical, considered and correct.

<p>The graduate can demonstrate that he/she</p> <ol style="list-style-type: none"> 1. Has mastered a theoretical, sophisticated topic and can solve related problems in an acceptable, extensive field of knowledge. 2. Is an expert in an advanced field of knowledge and in applications of the field. 3. Can do independent research through successful completion of a project and all assignments. 4. Can understand the application of specific academic and professional values. 5. Has the characteristics to take controlled risks. 6. Is introspective and adaptable. 	<p>The graduate can demonstrate that he/she</p> <ol style="list-style-type: none"> 1. Has mastered a specialist field of knowledge and can apply it to practical engineering problems and systems. 2. Is an expert in an advanced field of knowledge and in applications of the field. 3. Can independently work as an engineering specialist through successful completion of a project and all assignments. 4. Can understand the application of specific academic and professional values. 5. Has the characteristics to take controlled risks. 6. Is introspective and adaptable.
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Appendix C: Study Agreement Template

Department of Mechanical and Mechatronic Engineering
Stellenbosch University

Study Agreement for Postgraduate Study (ALL 1st Yr MEng Research & PhD students)

1. Particulars of Student:

- 1.1. Initials and Surname: _____
- 1.2. Student number: _____
2. Supervisor: _____
3. Programme: _____
4. Thesis/Dissertation topic: _____
5. Start date of study: _____
6. Date that thesis/research proposal is to be submitted:

7. Planned completion date of programme: _____

8. Responsibilities:

Once the thesis/research proposal has been accepted by the Postgraduate Coordinator/Faculty Board, it will be part of the study agreement.

8.1. Responsibilities of the Supervisor

The supervisor agrees to:

- 8.1.1. To be readily available for appointments with the student, typically _ hour per _____, except when on leave. When the supervisor is on research or study leave, he/she will make arrangements for continued study guidance.
- 8.1.2. Give regular guidance and feedback about formulation of objectives, literature, methodology and progress.
- 8.1.3. Arrange financing for equipment and operating costs that is needed by the student for his/her research.
- 8.1.4. Attempt to arrange bursaries and assistantships to the amount of _____ per year made available in ___ instalments for ___ years for the student, subject to acceptable progress of the student to complete the degree in the allocated time (two years for a Master's degree and three years for a Doctoral degree). This amount excludes any other bursaries or scholarships received during that year (such as bursaries from the University, Faculty, Department, NRF, Harry Crossley fund etc.). These additional bursaries will be monitored by the supervisor(s) in order for the total bursary amount paid to the student to not exceed _____ per annum. This bursary amount arranged by the supervisor may be revised by the supervisor if the student receives other bursaries.
- 8.1.5. Require no more than 9 hours of work per week not related to this programme (time for one student assistantship of 4 hours per week forms part of these hours).
- 8.1.6. Attempt to provide a workplace for the student in an office or in a laboratory.

8.2 Responsibilities of the student

The student agrees to:

- 8.2.1. Do his/her best to finish this study programme in _____ years.
- 8.2.2. Repay all bursaries and assistantships that were arranged by the supervisor and costs incurred by the Department, with interest accrued at the prime interest rate if the agreed upon study programme was not completed successfully within the maximum registration period allowed by the Faculty of Engineering for the programme. The repayment will be completed within two years of the last day of registration in the programme.

8.2.3. Until the completion of the programme in paragraph 3:

- ✧ Not accept bursaries without the permission of the supervisor except university awarded merit bursaries. All merit bursaries must be reported to the supervisor as soon as they are awarded, including the amount of said bursaries. This restriction will apply to all bursaries from the National Research Foundation, employers such as Eskom and SASOL, and bursaries from trusts or other donor agencies.
- ✧ Undertake no part/full time work, assistantships or modules without the prior permission of the supervisor, which must be applied for in writing.
- ✧ Not change the study plan without the permission of the supervisor. If the student wants to change programme or research project he/she must apply in writing to do so and may forfeit the bursary if it is decided that the new programme/ project is no longer part of the focus of the supervisor or grant.
- ✧ Be at his/her office from _____ to _____ and from _____ to _____ every workday, unless arranged otherwise with the supervisor, and to take no more than _____ workdays vacation per year.
- ✧ Work _____ hours per week on coursework, research and assistantships.
- ✧ Remain a full-time student for the entire academic year in which bursary is received. If the degree is completed midway through the year, only _____ % of the values of the bursary will be received from it. The supervisor must be informed of any change in the status of registration.
- ✧ Use all equipment, instrumentation, experimental set-ups and laboratories with care and good judgement.
- ✧ Scrupulously comply with all the terms and conditions set out in the Study Guide for the postgraduate programme, as well as Parts 1 and 11 of the University Calendar.
- ✧ Assist with demonstrations associated with the lab's funding support, as well as for the Faculty's Winterweek and Open Days.
- ✧ Comply with the Department's requirements for service by postgraduate students (e.g. student assistantships).

8.2.4 Submit at least _____ manuscript(s) for publication, which should meet the approval of the supervisor(s), or be acceptable for publication in the proceedings of an international/national conference within 24 months of study,

and/or

submit at least _____ manuscript(s) for publication within 24 months of study, which should meet the approval of the supervisor(s), and are acceptable for submission for publication in an international journal.

8.2.6. Provide the supervisor with the final draft of his/her thesis/dissertation (which has been thoroughly checked using spell checker and grammar checker software) at least 6 weeks before the intended date for submission to the examiners.

9. Signatures

Student _____

Date _____

Supervisor _____

PG Coordinator _____

Date _____

Date _____

Appendix D: Progress Assessment

Department of Mechanical and Mechatronic Engineering

POSTGRADUATE STUDENT PROGRESS REPORT

(MEng Research & PhD students not graduating December, or March of the following year)

The purpose of this report is for you to reflect on your work, your supervision and the resources available. Please answer it honestly as notification of problems will be viewed as a request for assistance and will help the Department to address the needs of postgraduate students.

1. Please complete Sections 1 and 2 and submit these to the Postgraduate Administrator directly.
2. Fill in your name and your supervisor's name in Section 3, and ask your supervisor to complete this. The written report (mentioned in Section 2B) as well as Section 3 should be handed to your supervisor at least **a week before** the actual deadline of **31 October** – please communicate the deadline to him/her by when these documents should be handed in with the PA.
3. Completion of the annual report is essential for your continued enrolment.

1. PERSONAL DETAILS

Name Student No.

Address.....

Telephone No. (Office) (Home) (Cell).....

Thesis Title

Supervisor(s)

Degree programme: MEng Research / PhD

Commencement Date Expected Completion Date

2A. STUDENT'S COMMENTS

- 2.1. Has your study plan been submitted AND accepted? Yes No
- 2.2. Has your thesis proposal been submitted AND accepted? Yes No n/a
Adv Mech Adv.Maths 800-level
- 2.3. How many modules have you completed to date?
- 2.4. How many modules do you still have to complete?
- 2.5. How often do you consult with your supervisor(s)? To what extent has this met your needs? Daily Weekly Monthly Other
.....
- 2.6. Have you presented your work in any formal departmental, university or outside forum in the last year? Give broad details (e.g. departmental seminar, paper to national conference, etc.) Yes No
.....
- 2.7. Have you submitted any work for publication in the last year? Yes No
- 2.8. Would you like additional help in language / writing / communications skills? Yes No
Please elaborate
- 2.9. Does the department provide all necessary facilities for your research? Yes No

2.10. In your view:

	Strongly Disagree			Strongly Agree	
You have diligently and effectively applied yourself to your project.	1	2	3	4	5
You have shown initiative consistent with the requirements of the research program/course and level of study.	1	2	3	4	5
You have made satisfactory progress throughout the year.	1	2	3	4	5
You have shown that you will be able to complete the research programme by the due date.	1	2	3	4	5
You have made satisfactory progress in writing your thesis/dissertation	1	2	3	4	5
The scope of the project has been sufficiently outlined.	1	2	3	4	5
Your supervisor exhibits the required expertise to support you during this project.	1	2	3	4	5
Your supervisor has provided reasonable guidance.	1	2	3	4	5
You expect to complete by the date indicated in section 1.	1	2	3	4	5

If you have circled a 3 or lower, please elaborate in a separate document and add it to Sec 2A

2.11. Have there been any difficulties affecting the progress of your work? Yes No

If yes, have any of the following problems significantly limited your progress over the past year?

- | | |
|--|--|
| <input type="checkbox"/> Academic background | <input type="checkbox"/> Language |
| <input type="checkbox"/> Settling in | <input type="checkbox"/> Access to books/equipment |
| <input type="checkbox"/> Experimentation | <input type="checkbox"/> Understanding work expected |
| <input type="checkbox"/> Communication with people | <input type="checkbox"/> Health/Personal |
| <input type="checkbox"/> Mechanical failures/Long deliveries | <input type="checkbox"/> Financial |
| <input type="checkbox"/> Employment commitments | <input type="checkbox"/> Other commitments |

If any boxes have been marked, please indicate in your report (Section 2B) what steps you have taken or will take to help overcome these problems.

2.12 Do you wish to apply for an extension? Yes No

If yes, please elaborate in your report (Section 2B)

2B – REPORT ON RESEARCH PROGRAM

Please attach a report (maximum of 4 pages) on your research progress to date. *This report should be signed by your supervisor.* Please make sure you include:

- A statement of the problem that is to be addressed.
- The overall research work plan (start to finish).
- A short summary of results to date.
- The work still to be completed.
- Comments on aspects indicated above.
- How far you have proceeded in writing your thesis.

2C – SIGNATURE

I have witnessed the completed entries above, and I also confirm that I have complied with the University's Code of Conduct for Research.

Name (Print) Signature Date

Advice to Students:

Please remember that throughout your candidature you can expect support and guidance to be readily at hand in your Department or Faculty. If problems arise it is appropriate that you consult with your supervisor and then, if necessary, the Postgraduate Coordinator, Departmental Chairman or Dean.

3. SUPERVISOR'S COMMENTS

Student Name

Supervisor

3.1. Are supervision arrangements for the student finalised for the whole of the coming year? Yes No

3.2. How often do you consult with your student? Daily Weekly Monthly Other

3.3. Are you satisfied with the frequency of consultation with the student? Yes No

3.4. Is the department able to provide all necessary facilities for the student's research during the coming year? Yes No

3.5. In your view:

	Strongly Disagree			Strongly Agree	
	1	2	3	4	5
The student has diligently and effectively applied him/her to his/her project.	1	2	3	4	5
The student has shown initiative consistent with the requirements of the research program/course and level of study.	1	2	3	4	5
The student has made satisfactory progress throughout the year.	1	2	3	4	5
The student has shown that he/she will be able to complete the research programme by the due date.	1	2	3	4	5
The student has made satisfactory progress in writing his/her thesis/dissertation	1	2	3	4	5
The scope of the project has been sufficiently outlined.	1	2	3	4	5
You exhibit the required expertise to support the student during this project.	1	2	3	4	5
You have provided reasonable guidance.	1	2	3	4	5
You expect the student to complete by the date indicated in section 1.	1	2	3	4	5

If you have circled a 3 or lower, please elaborate:

.....

3.6. Have any of the following problems significantly limited the student's progress over the past year?

- | | |
|--|--|
| <input type="checkbox"/> Academic background | <input type="checkbox"/> Language |
| <input type="checkbox"/> Settling in | <input type="checkbox"/> Access to books/equipment |
| <input type="checkbox"/> Experimentation | <input type="checkbox"/> Understanding work expected |
| <input type="checkbox"/> Communication with people | <input type="checkbox"/> Health/Personal |
| <input type="checkbox"/> Mechanical failures/Long deliveries | <input type="checkbox"/> Financial |
| <input type="checkbox"/> Employment commitments | <input type="checkbox"/> Other commitments |

If any boxes have been marked, please indicate what steps have been taken or will be taken to help overcome these problems.

.....

3.7. If the student has applied for an extension, please comment and explain your support of this.

.....

If you have answered no to any of the above questions, please elaborate (use additional sheet if necessary).

3B – SIGNATURE

I have witnessed the completed entries above, and I also confirm that the research is conducted in compliance with the University's Code of Conduct for Research.

Name (Print) Signature Date

NB: Please submit the completed report & the signed (by supervisor) written report of the student to the Postgraduate Administrator without delay.

Appendix E: Prescribed structure of the PhD research proposal

A large number of research proposals are considered by the Faculty Board and using a common structure will help those involved to productively review the proposals. PhD candidates must therefore use the following structure for their research proposals that are prepared for consideration by the candidacy panel. This structure is aimed at giving the candidates a clear framework of what the candidacy panel expects. The instructions provided for each section must be adhered to. Please note that the proposal will also be read by persons outside the candidate's field of research and therefore detailed background knowledge of the state of the art should not be assumed.

Should a masters degree be upgraded following the decision of the examination panel, the final accepted masters thesis will serve to support headings 1, 2, 3, 4, 8 and 9 of the Research Proposal below (refer to the masters thesis for more detail), ie. these sections may be shorter than proposed.

Note the Executive Summary must be handed in as an extra separate document.

The numbered section headings that must be used, the recommended length of each section and the requirements for each section's content are as follows:

Executive summary (maximum of 600 words):

The information must be presented under the following headings – headings should be bold and clear and numbered – please fit your document to 1 page:

Title of the research project,

Name of student,

Name of supervisor(s),

1. Brief description, and aims, of the research project.
2. Anticipated unique research contributions(s) of the study.
3. A broad time framework for the study (in terms of typically 4 to 10 activities). A **Gantt chart** is compulsory.

Research Proposal:

1. **Introduction** (maximum 1 page): Explain the background to the research project, e.g. where the specific research project originated and how it relates to other work done in the research group or department.
2. **Objectives** (less than 1/2 page): A specific and concise description of the research question or research hypothesis. This section must also explicitly describe the expected original contribution of the research. This section and/or the following section must make it clear that the objectives are worthy of PhD research (for example requiring advanced and specialised expertise). Note that the methods used to achieve the contribution should not be described here, but should be reflected in the planning section.
3. **Motivation** (1/2 to 1 page): Why are the specific research objectives worth pursuing? Note that the general research area must not be the focus, but the specific objectives of the candidate's own research. Avoid a long description of the general research area or background.
4. **Literature review** (typically 10 or more pages): what has already been done by others in the area of research and what are the main issues, discussed in the literature, that are relevant to the candidate's specific research topic? This section must enable the candidacy panel to assess what the main engineering science areas are that are relevant to the research and what type of work, facilities, etc are needed to make an original contribution. The final subsection of the literature review must describe how the candidate's research objectives differ from or agree with what other researchers have already done.
5. **Planning** (2 to 3 pages): A description of main activities (typically 4 to 10), making clear how each activity contributes to the achieving of the objectives. This section must include a **Gantt chart** showing the time allocated to each activity.
6. **Facilities required** (1/2 to 1 page): A description of the facilities required (including equipment, labs, software licenses, etc) and the planning to have the facilities available. This section must include a budget for the research (capital and running costs) and an outline of where the funds are expected to be found.
7. **Risk assessment** (less than 1 page): A critical assessment of the risks to the completion of the research, for example interdependence with other research being conducted in parallel by other students, the availability of critical facilities, funding, protocol approval by ethical committees, etc.
8. **Progress to date** (maximum 3 pages): A description and a critical self-assessment of the research work done to date. This could include, for example some detail planning, and a description of the methods and materials used/to be used. It must be clear from this section that the candidate is making progress commensurate with the time already spent on the research, so that the candidacy panel can assess whether

the candidate has the ability to complete the remaining work according to the planning given in the previous sections.

9. **Conclusion** (maximum 1 page): A self-assessment of the research objectives' suitability, the progress made to date, and the risks to completing the study within the allowed time.

The Candidacy Panel evaluates the proposal based on the following criteria:

RECOMMENDATIONS: CANDIDATE AND RESEARCH PROPOSAL

	YES	NO
The candidate has satisfactorily demonstrated background knowledge appropriate for the study.		
The candidate has satisfactorily demonstrated research capabilities appropriate for the study.		
Satisfactory expected original contributions are explained in the research proposal.		
A satisfactory exposition of the literature relevant to the PhD studies, as well as a synthesis and evaluation of the most important themes found in the literature, is given in the research proposal.		
A satisfactory explanation of the study's objectives, as well as how it relates to previously published work and the expected original contribution of the study, is given in the research proposal.		
The research methodology, aligned with study's objectives, in the research proposal is satisfactory.		
The research proposal gives a broad time schedule for the study (typically in terms of 4 to 10 activities, with a short description of the focus of each) that is reasonable.		
The research proposal gives a clear explanation of the infrastructure (software, equipment, laboratories, operating costs, etc.) necessary to complete the study, as well as reasonable arrangements to provide it.		
The critical self-evaluation by the student of progress made to date and of his/her research capabilities given in the research proposal is satisfactory.		
The supervisor and co-supervisors (if applicable) have expertise appropriate for the study.		
Is it recommended by the Admissions Committee/Candidature Panel that the candidate register for a PhD with the proposed research topic and supervision? <i>(Please attach appropriate explanatory documentation if the registration is not recommended.)</i>		