



University of Pretoria Yearbook 2021

Faculty of Natural and Agricultural Sciences

Welcome to the Faculty of Natural and Agricultural Sciences

The hopes of South Africa rests, to a very large extent, on developments in Science, Engineering and Technology. The Faculty of Natural and Agricultural Sciences aims to provide leadership in the fields of basic natural sciences and mathematics. It has substantial records of research achievement. High quality of undergraduate and postgraduate education is offered and involvement in a variety of community projects contribute to excellence provided by the Faculty.

Faculty regulations and information

The rules for the degrees published here are subject to change and may be amended after the publication of this information.

The General Regulations (referred to as G.1-G.56) and General Rules apply to all faculties of the University of Pretoria. It is expected of all students to familiarise themselves well with these regulations and rules as well as all faculty-specific and programme-specific regulations and information as stipulated in the online yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression.

1. Examinations

Also consult General Regulations and Rules.

1.1 Examination admission and pass requirements

- A final mark of at least 50% is required to pass the module.
- Mainstream modules: A minimum semester mark of 30% is required to be admitted to the examination in a first-year, first-semester module on 100-level and a minimum semester/year mark of 40% is required for admission to the examination in all other modules.
- Extended BSc (Four-year programme) modules: All students in the first two semesters of the extended BSc (Four-year programme) are allowed to write the examination in that module. In the third-semester modules a minimum semester mark of 30% is required for admission to the examination.
- Class attendance is compulsory for all students in all modules for the full duration of all programmes. A student may be refused admission to the examination or promotion to a subsequent year of study if he/she fails to comply with the attendance requirements.
- In certain modules, eg those with practical components, a department may stipulate additional requirements for students to be admitted to the examination. These requirements must be published in the study guide of the module. A student may be refused admission to the examination in a module by the head of the relevant department should the student not comply with these requirements.
- In exceptional cases, where it is deemed appropriate, the Dean of the Faculty may excuse a student from attending all or a part of the activities in a module.

Please note: The requirements for admission to the examination is published in the study guide and the relevant department is required to inform students of the specific requirements at the beginning of each module.

1.2 Subminima in examinations

A subminimum of 40% is required in the examination in each module. The year or semester mark of a module is



obtained through continuous assessment of a student's performance during the module. A student must satisfactorily complete the practical component of the module (if applicable). The method by which the year/semester mark will be obtained, is published in the study guide of the module.

1.3 Examinations

The examinations for first-semester modules and the first- and second-quarter modules take place in May/June, while all other examinations (second-semester modules, third- and fourth-quarter modules and year modules) take place in October/November.

The final mark for the module is a combination of the year or semester mark and the examination mark, with the proviso that a module can only be passed if a subminimum of 40% is obtained in the examination and the practical component (if applicable) of the module has been satisfactorily completed. A final mark of at least 50% is required to pass a module. The year or semester mark must fall within a range of 40%-60% and the examination mark must fall within a range of 40%-60% of the final mark. Deviations from this rule can be approved by the Dean. The formula that is used to determine the final mark will be specified in the study guide of the module.

1.4 Ancillary examinations

After completion of an examination and before the examination results are published, the examiners may decide to summon a student for an ancillary examination on particular aspects of the work in that module with a view to determining:

- whether a candidate who does not comply with the requirements to pass a module could achieve a final pass mark; or
- whether a candidate, who does not comply with the requirements for a pass with distinction, will be able to improve his or her final mark.

It is, therefore, possible that, depending on the importance a lecturer attaches to continuous evaluation, no supplementary examinations may be awarded in a certain module.

If ancillary examinations are awarded in a module, the guidelines indicating the basis for such consideration, have to be published in the study guide of the module.

1.5 Re-marking of examination papers (also consult the G. Regulations)

After an examination, departments give feedback to students about the framework that was used by the examiners during the examination. The way in which feedback is given, is determined by the departmental heads. Students may apply for re-marking of an examination paper after perusal and within 14 calendar days after commencement of lectures in the next semester. The prescribed fee has to be paid. The paper will then be re-marked by an examiner appointed by the head of the department.

1.6 Supplementary examinations

- a. Supplementary examinations in first-semester modules take place after the May/June examinations, while those in second-semester and year modules take place after the October/November examinations.
- b. To pass a supplementary examination, a student must obtain a minimum of 50%.
- c. The highest final percentage a student can obtain in a supplementary examination is 50%.
- d. If a student fails the supplementary examination, the mark obtained in the supplementary examination will be recorded as the final mark for the module.
- e. Special supplementary examinations are not arranged for students who are unable to write the examinations at the times and venues scheduled for supplementary examinations. (Also consult the G. Regulations.)

2. Special examinations in the Faculty of Natural and Agricultural Sciences

A student who requires a maximum of two modules and not more than 36 credits outstanding to comply with all the requirements for the degree, may be admitted by the Dean, on the recommendation of the head of



department, to special examinations in modules failed, provided that this will enable him or her to comply with all the degree requirements. A student who has obtained a final mark of less than 40% in any one of the relevant modules, or who has previously been admitted to a special examination, does not qualify for this concession.

3. Academic promotion requirements

General

All students whose academic progress is not acceptable can be suspended from further studies.

- A student who is excluded from further studies in terms of the stipulations of the abovementioned regulations, will be notified in writing by the Dean or Admissions Committee at the end of the relevant semester.
- A student who has been excluded from further studies may apply in writing to the Admissions Committee of the Faculty of Natural and Agricultural Sciences for re-admission.
- Should the student be re-admitted by the Admissions Committee, strict conditions will be set which the student must comply with in order to proceed with his/her studies.
- Should the student not be re-admitted to further studies by the Admissions Committee, he/she will be informed in writing.
- Students who are not re-admitted by the Admissions Committee have the right to appeal to the Senate Appeals Committee: Admissions.
- Any decision taken by the Senate Appeals Committee: Admissions is final.

4. Recognition of excellence

Criteria for eligibility

To qualify for the awards the following criteria must be met:

(a) Dean's Merit List

The student will be considered if she/he has passed all first-time registered modules as prescribed for a programme at each year level of study for that year (minimum 140 credits per year/88 credits for the first year of the BSc(Four-year Programme)) with a weighted average of 75%.

(b) Other achievers

The student will be considered if she/he has passed all first time registered modules as prescribed for a programme for that year (minimum 140 credits per year/88 credits for the first year of the BSc(Four-year Programme)) with a weighted average of 65%.

5. Requirements for specific modules

A candidate who:

- a. passed the Grade 12 examination in Mathematics as well as in Physical Science with at least 60%, will be admitted to Molecular and Cell Biology and a module in the subjects Zoology and Entomology, Genetics, Microbiology or Plant Science;
- b. who does not qualify for STK 110, must enrol for STK 113 and STK 123;
- c. registers for Mathematical Statistics (WST) and Statistics (STK) modules must take note that WST and STK modules, except for STK 281, may not be taken simultaneously in a programme; and
- d. registers for a module presented by another faculty must take note of the prerequisites for that module, subminimum required in examination papers, supplementary examinations, etc.

Please note:

'in the Grade 12 examination' refers to the final National Senior Certificate examination.

6. Academic information management (AIM 111 and AIM 121)

It is compulsory for all new first-year students to take Academic information management modules. Please see curricula for details.

Faculty guidelines for consideration of BTech and/or MTech students to postgraduate study

Candidates who hold BTech and/or MTech degrees are required to fulfil the following conditions:

1. Honours level

The candidate must have a BTech degree with a minimum of 60% in the broad area of specialisation that the candidate wishes to pursue for an honours programme. The student will be given conditional acceptance to an honours programme, but in order to align the student's undergraduate training with the outcomes expected of a BSc graduate, the student will be expected to undertake additional coursework at NQF level 7. The head of department concerned will be required to identify specific modules. The programme of study must be recommended by the Postgraduate Studies Committee, Faculty Board and for approval by the Subcommittee of the Senate. Confirmation of candidature will be based on the successful completion of the additional module requirements during the first year of the honours programme.

1.1 Procedure

The candidate must submit an official application form, together with a motivation, matriculation certificate, academic record and a short CV. The CV should include details of relevant work experience and, where applicable, any publications. The head of department has to identify and prescribe modules as set out in 1 above. The application is submitted via the Faculty Postgraduate Studies Committee and the Faculty Board, to the Subcommittee of the Senate for approval.

Refer to the General Regulations.

2. Master's level

The candidate must have a BTech degree with a minimum of 60% in the broad area of specialisation that he/she wishes to pursue for a master's programme. The student will be given conditional acceptance to a master's programme, but in order to align the student's undergraduate training with the outcomes expected of a BScHons graduate, the student will be expected to undertake additional coursework at NQF levels 7 and 8. Additional coursework will be prescribed by the head of department concerned. A minimum of 70 credits at NQF level 8 will be required. The programme of study must be recommended by the Faculty Postgraduate Studies Committee, Faculty Board and for approval by the Subcommittee of the Senate. Confirmation of candidature will be based on the successfully completion of the additional module requirements during the first year of the master's programme.

2.1 Procedure

The candidate must submit an official application form, together with a motivation, matriculation certificate, academic record and a short CV. The CV should include details of relevant work experience and, where applicable, any publications. The head of department has to identify and prescribe modules as set out in 1 above. The application is submitted via the Faculty Postgraduate Studies Committee and the Faculty Board, to the Subcommittee of the Senate for approval.

Refer to the General Regulations.

3. Doctoral level

The candidate must have an MTech degree and have obtained at least 60% for the MTech dissertation. Since the PhD is clearly more demanding of a wider (philosophical) scientific background, the selection of candidates for the PhD degree must be stringent, and could include outside evaluation of the dissertation work by nominees selected by the head of department and recommended by the Faculty Postgraduate Studies Committee, evidence of peer-reviewed publication, appropriate work-related experience (ie in a research environment) and, where necessary, formal coursework to address shortcomings in the academic background.

3.1 Procedure

The candidate must submit an official application form, together with a motivation, academic record, a copy of

the MTech dissertation and a short CV. The CV should include details of appropriate work experience and list of any publications. The head of department will submit a motivation to support the application. The application is submitted, via the Faculty Postgraduate Studies Committee and the Faculty Board, to the Subcommittee of the Senate for approval.

Refer to the General Regulations.

Senate of the University of Pretoria guidelines for Senate discretionary admissions

G.54 POLICY ON POSTGRADUATE STUDENT CASES AND THE RECOGNITION OF PRIOR LEARNING

As the University has a finite capacity in most undergraduate fields (its limits have already been reached or those admitted are selected from a large number of applicants), the University's policy on the recognition of prior learning only applies to student cases at postgraduate level (including postgraduate diplomas).

Furthermore, as the University's strategic objective is to be an internationally recognised research university, admission to postgraduate study by means of the recognition of a prior learning pathway is the exception rather than the rule.

Senate may –

- a. grant a graduate of another higher education institution (either in the Republic or elsewhere) a status at the University that is equivalent to the status the student had at such other higher education institution.
- b. admit a person, who
 - i. has passed examinations at another university or institution (either in the Republic or elsewhere) which Senate deems equivalent to, or higher than the examinations prescribed for a degree at the University, which are set as a prerequisite for admission to a particular postgraduate study programme, or for the admission of such a person as a research student; or
 - ii. in another manner has reached a standard of competence Senate considers adequate for the purposes of postgraduate study or research at the University, as a student for a postgraduate degree, diploma or certificate.

The regulation provides two alternative routes with regard to the admission of students at postgraduate level in cases where they do not comply with the prescribed requirements:

1. A first possibility is via the academic route where a student has proven himself/ herself on the basis of academic achievement.
2. The second possibility refers to a standard of competence that would make a student eligible to continue with postgraduate studies.

With regard to the viewpoint set out above candidates may, inter alia, be evaluated according to the following criteria:

Honours studies

1. In cases where only a diploma and not a degree programme was previously offered in a certain field of study, the Dean may, in consultation with the head of the department, consider the admission of such candidates.
2. Should a student have the necessary academic background, but did not graduate in the applicable field of study, he/she may be admitted to the honours degree on the grounds of:
3. the successful completion of an oral/written entrance examination; and
4. a submission to the Senate.

In certain cases one or more external examiners may evaluate such an application.

or



1. The academic merit of a student who has achieved a standard of competence in another manner can be evaluated by means of:
2. a written motivation by the student which is evaluated by the head of the department;
3. the successful completion of an oral/written entrance examination in which one or more external examiners were involved; and
4. a submission to the Senate.

Master's studies

1. The application of a student who is not in possession of the required honours degree which would admit him/her to study for the master's degree, but has an academically advanced background, may be considered on grounds of:
2. the successful completion of an oral/written entrance examination in which one or more external examiners were involved; and
3. a submission to the Senate.

or

1. In cases where a standard of competence was reached in another manner, status may be granted by means of:
2. a written motivation by the student which was compiled in conjunction with the head of the department and/or study supervisor, and a recommendation;
3. the successful completion of an oral/written entrance examination in which one or more external examiners were involved; and
4. a submission to the Senate.

Doctoral studies

1. The application of a student who is not in possession of the required master's degree which would admit him/her to doctoral study, but has an academically advanced background, may be considered on the grounds of:
 - the successful completion of an oral/written entrance examination in which one or more external examiners were involved; and
 - a submission to the Senate
- or
2. In cases where a standard of competence was reached in another manner, status may be granted by means of:
 - a written submission compiled in conjunction with the head of the department and/or study supervisor in which the standard of competence is indicated;
 - a report by an external reference(s) motivating the merits of admission to doctoral study;
 - the successful completion of an oral/written entrance examination in which one or more external examiners were involved; and
 - a submission to the Senate.



Undergraduate Degree

BConSci Clothing Retail Management (02130110)

BConSci Food Retail Management (02130108)

BConSci Hospitality Management (02130109)

BSc Actuarial and Financial Mathematics (02133395)

BSc Applied Mathematics (02133253)

BSc Biochemistry (02133398)

BSc Biological Sciences (02133397)

BSc Biotechnology (02133403)

BSc Chemistry (02133173)

BSc Culinary Science (02133320)

BSc Ecology (02133400)

BSc Engineering and Environmental Geology (02133043)

BSc Entomology (02133401)

BSc extended programme - Biological and Agricultural Sciences (02130014)

BSc extended programme - Mathematical Sciences (02130016)

BSc extended programme - Physical Sciences (02130015)

BSc Food Science (02133406)

BSc Genetics (02133402)

BSc Geography and Environmental Science (02133363)

BSc Geoinformatics (02133393)

BSc Geology (02133023)

BSc Human Genetics (02133409)

BSc Human Physiology (02133408)



BSc Human Physiology, Genetics and Psychology (02133396)

BSc Mathematical Statistics (02133274)

BSc Mathematics (02133263)

BSc Medical Sciences (02133407)

BSc Meteorology (02133313)

BSc Microbiology (02133404)

BSc Nutrition (02133322)

BSc Physics (02133203)

BSc Plant Science (02133405)

BSc Zoology (02133399)

BScAgric Agricultural Economics and Agribusiness Management (02133410)

BScAgric Animal Science (02133411)

BScAgric Applied Plant and Soil Sciences (02133431)

BScAgric Plant Pathology (02133433)



Honours

BAgricHons Extension (02241000)

BAgricHons Rural Development (02241002)

BScAgricHons Crop Science (02241004)

BScHons Actuarial Science (02240278)

BScHons Applied Mathematics (02240172)

BScHons Biochemistry (02240701)

BScHons Bioinformatics (02240702)

BScHons Biotechnology (02240393)

BScHons Chemistry (02240123)

**BScHons Engineering and Environmental Geology Engineering Geology
(02240375)**

BScHons Engineering and Environmental Geology Hydrogeology (02240376)

BScHons Entomology (02240704)

BScHons Financial Engineering (02240277)

BScHons Food Science (02240602)

BScHons Genetics (02240705)

BScHons Geography and Environmental Science (02240415)

BScHons Geoinformatics (02240414)

BScHons Geology (02240142)

BScHons Mathematical Statistics (02240192)

BScHons Mathematics (02240182)

**BScHons Mathematics and Mathematics Education Applied Analysis
(02240184)**



BScHons Mathematics and Mathematics Education Differential Equations and Modelling (02240185)

BScHons Mathematics and Mathematics Education Algebra and Analysis (02240183)

BScHons Mathematics of Finance (02240276)

BScHons Medicinal Plant Science (02240706)

BScHons Meteorology (02240074)

BScHons Microbiology (02240601)

BScHons Physics (02240232)

BScHons Plant Science (02240707)

BScHons Soil Science Environmental Soil Science (02240600)

BScHons Statistics and Data Science (02240193)

BScHons Wildlife Management (02240700)

BScHons Zoology (02240703)



Master's

MAgric Animal Production Management (02256000)

MAgric Extension (02256001)

MAgric Rural Development (02256003)

MConSci (02253014)

MConSci Clothing Management (02253012)

MConSci Food Management (02253013)

MConSci Interior Merchandise Management (02253011)

MSc Actuarial Science (02250396)

MSc Advanced Data Analytics (Coursework) (02250195)

MSc Air Quality Management (02250520)

MSc Air Quality Management (Coursework) (02250408)

MSc Applied Geoinformatics (Coursework) (02250417)

MSc Applied Mathematics (02250172)

MSc Biochemistry (02250512)

MSc Bioinformatics (02250514)

MSc Biotechnology (02250537)

MSc Chemistry (02250123)

MSc Engineering and Environmental Geology (02250375)

MSc Engineering and Environmental Geology Hydrogeology (02250376)

MSc Engineering Geology (02250374)

MSc Entomology (02250518)

MSc Environment and Society (02250522)

MSc Environment and Society (Coursework) (02250403)



MSc Environmental Ecology (02250524)
MSc Environmental Ecology (Coursework) (02250404)
MSc Environmental Economics (Coursework) (02250405)
MSc Environmental Education (02250528)
MSc Environmental Education (Coursework) (02250531)
MSc Environmental Management (02250526)
MSc Environmental Management (Coursework) (02250407)
MSc eScience (Coursework) (02250193)
MSc Financial Engineering (02250188)
MSc Food Science (02250506)
MSc Forest Management and the Environment (Coursework) (02250415)
MSc Forest Science (02250532)
MSc Genetics (02250535)
MSc Geography (02250413)
MSc Geoinformatics (02250414)
MSc Geology (02250142)
MSc Mathematics (02250185)
MSc Mathematics Education (02250187)
MSc Mathematics of Finance (02250186)
MSc Medicinal Plant Science (02250539)
MSc Meteorology (02250073)
MSc Microbiology (02250504)
MSc Nutrition (02250416)
MSc Physics (02250232)



MSc Plant Pathology (02250500)

MSc Plant Science (02250541)

MSc Science Education (02250445)

MSc Soil Science (02250502)

MSc Water Resource Management (02250530)

MSc Water Resource Management (Coursework) (02250406)

MSc Wildlife Management (02250510)

MSc Zoology (02250516)

MScAgric Agricultural Economics (Coursework) (02255001)

MScAgric Agricultural Extension (02255014)

MScAgric Agronomy (02255010)

MScAgric Animal Science Animal Breeding and Genetics (02255013)

MScAgric Animal Science Animal Nutrition (02255008)

MScAgric Animal Science Livestock Production and Ecology (02255009)

MScAgric Animal Science Production Physiology and Product Quality (02255007)

MScAgric Entomology (02255003)

MScAgric Genetics (02255005)

MScAgric Horticulture (02255002)

MScAgric Pasture Science (02255011)

MScAgric Plant Pathology (02255006)

MScAgric Soil Science (02255012)



Doctorate

PhD Actuarial Science (02260772)

PhD Agricultural Economics (02261030)

PhD Agronomy (02260803)

PhD Air Quality Management (02261045)

PhD Animal Production Management (02260548)

PhD Animal Science (02261050)

PhD Biochemistry (02260442)

PhD Bioinformatics (02261020)

PhD Biotechnology (02261021)

PhD Chemistry (02260453)

PhD Consumer Science Clothing Management (02263006)

PhD Consumer Science Development (02263007)

PhD Consumer Science Food Management (02263008)

PhD Consumer Science Interior Merchandise Management (02263005)

PhD Engineering and Environmental Geology (02260547)

PhD Engineering and Environmental Geology Hydrogeology (02260524)

PhD Engineering Geology (02260546)

PhD Entomology (02260242)

PhD Environment and Society (02261040)

PhD Environmental Economics (02261041)

PhD Environmental Management (02261042)

PhD Extension (02260900)

PhD Food Science (02261060)



PhD Forest Science (02260802)
PhD Genetics (02260502)
PhD Geography (02260513)
PhD Geoinformatics (02260514)
PhD Geology (02260523)
PhD Horticultural Science (02260806)
PhD Mathematical Sciences (02260762)
PhD Mathematical Statistics (02260612)
PhD Medicinal Plant Science (02260800)
PhD Meteorology (02260632)
PhD Microbiology (02260562)
PhD Nutrition (02260742)
PhD Pasture Science (02260804)
PhD Physics (02260482)
PhD Plant Pathology (02261070)
PhD Plant Science (02260801)
PhD Rural Development (02260901)
PhD Science and Mathematics Education (02260754)
PhD Soil Science (02260805)
PhD Water Resource Management (02261043)
PhD Wildlife Management (02260662)
PhD Zoology (02260462)

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