



BSc Extended Programme

Mathematics – cornerstone of any STEM degree

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What is so special about maths?

- Requires independent thinking (response to new situation, associating new experience with prior knowledge).
- Requires problem solving skills.
- Works with abstract concepts and relationships (being able to abstract trend, causal relationship or pattern from observations is the essential part of a scientific discovery)

Independent thinking, problem solving and abstracting quantitative relations are sought after skills by all employers and the same goes for the Universities

The world is changing fast: Any specific job that you are aiming for is likely not to exist or to have significantly change by the time you graduate. The skills **above in red** are essential for any career in general, but even more so for career in STEM discipline.

Mathematics is an environment in which the skills of

- **Independent thinking,**
 - **problem solving and**
 - **abstracting quantitative relations**
- are developed and demonstrating.**

In the absence of a specific measure/test the success in Mathematics is used as indicator for level of acquiring such skills for work or for further studies, e.g. note the admission requirements of disciplines not involving university mathematics.

Understanding the Extended Programme

- Unique opportunity for smooth entrance into BSc, BEd, BCom or BEng programmes.
- The school – university gap is real.
 - ❖ School maths is taught as a set of recipes – recipe works only for specific type of questions.
 - ❖ University maths is based on understanding – if you understand something you can never misunderstand it (as you can see the word does not exist).
- WTW133 and 135 both deal with the topics of school maths, but these are not just a revision. They require deeper understanding of the content. If you continue relying on recipes, you will fail. If you just pass with 50%, you will fail later. These modules lay foundation – it must be solid. Aim to master all the content.
- Possible exists:
 - WTW133/WTW135+WTW144
 - WTW133/WTW135+WTW144+WTW154
 - WTW135+WTW143+WTW153+WTW148+WTW146
 - WTW135+WTW143+WTW153+WTW124+second year maths(Mathematics intensive degrees)
- What is required from you: motivation and hard work. It is up to you to make the best out of this great opportunity.

WTW135+WTW143+WTW153: The central pillar of Maths intensive degrees

Education (matric maths)
Computer Science (maths)
Mathematical Statistics
Econometrics
Physics, Geology, Meteorology
Mathematics (pure, applied,
financial and actuarial)

Third year modules: one or two majors			
WTW220/4	WTW264	WTW221	WTW248
WTW211	WTW218	WTW286	WTW285
WTW124		WTW162	WTW123
WTW153		WTW152	WTW115
WTW143			
WTW135			

Failing any of the modules in red blocks your further studies

BEng is very similar, but is taught separately due to the large number of students

PASSING WITH 50% IS NOT A SUCCESS

- Unlike other students, you have the opportunity in terms of time, facilities and support to master the content of the first year of mathematics and have a solid foundation for successfully and on time completing your studies.
 - Aim for 100%. Learn everything. Do not leave any tutorial unfinished. Do not leave any question unanswered. If you have 70%, you did 30% wrong. Find out what do you need to learn.
 - If you pass with 50%, I suggest you really need to revisit your motivation why you are here. Is the study path you have selected really your passion? If it is, then why are you learning only half of it?
 - Our analysis shows that students with poor performance in the first year of the Extended Programme are not successful in completing Mathematics Intensive Degrees.
- Hence, some minimum requirements are implemented.

Minimum Requirements for ALL Mathematics Intensive Degrees

- Student should achieve at least GPA of 65% to proceed with a mathematics intensive degree
- If the requirement of GPA of 65% is not satisfied the students may not register for WTW153, WTW114 or WTW158
- Students who passed all modules, but did not achieve GPA of 65% may proceed in any of the other degrees. If they choose a degree involving upto one year of mathematics they can use the earned credits, e.g.

WTW133+WTW144+WTW154=WTW134/WTW165

WTW134+WTW146+WTW148 = one year of maths

Minimum Requirements for admission to BSc in Actuarial and Financial Mathematics

- **WTW135: 60%**
- **WTW143: 60%**
- **WST133: 60%**
- **WST143: 60%**
- **WTW153: 70%**
- **WTW124: 70%**
- **There are other performance requirements,
but these are the most important for now.**

Less mathematically intensive streams

- WTW133+WTW144+WTW154 is specifically intended for the Biological Sciences, but one can also look at other options after completing the year.
- Note that if you fail WTW135 you are automatically out of the mathematics intensive stream and will continue in the second semester with WTW144.
- There are many programmes in which one can continue having passed the year with WTW144.

Finding the correct study path

First year at the University is also an year of orientation:

- *Identifying better one's interests, strengths and weakness.*
- *Getting better knowledge of the University programmes*
- *Identifying programmes which would be better suited for students' profile.*

Many students change their programmes during their studies. If this is done in the first year, then the new degree can be completed in minimum time or minimum time +1.

Student who do not achieve at least GPA of 65% in the maths intensive programme have to change to a less math intensive programme.

We list on the next slides some not math intensive programmes. Please contact the respective department or faculty adviser for any specific admission requirements.

Why completing in minimum time or minimum time +1 is important

- **Rather than spending money you can start earning money earlier. Do the math!**
- **Entering a profession or further studies earlier gives time for prosperous career.**
- **Bursaries and study loans are linked to your academic studies progressing on time.**
- **The University cannot afford to keep students for a long time. The government subsidy progressively decreases with the years above the minimum time for completion of the degree. No subsidy, if the student takes more than twice the minimum time.**
- **Make sure that you are in the correct programme, which corresponds to your talent and passion and in which you will be successful. Talk to the advisers if you are not sure.**

#FLY@UP with Maths

#Take off @ 65%

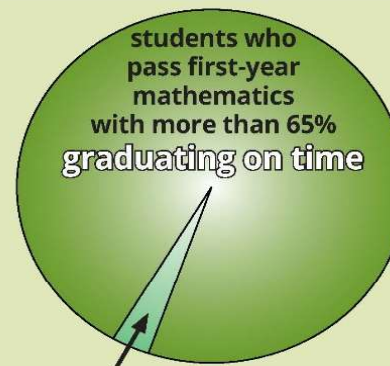
Want to graduate **ON TIME**?

... keep your maths mark above 65%

Student survey shows:

STUDENTS GRADUATING ON TIME,

are those who achieve more than 65% for first-year mathematics



students who pass first-year mathematics with less than 65% graduating on time

Data from survey on the 2013 and 2014 cohorts of students in mathematics intensive degrees (two or more years of mathematics)

What do I do?

1

Stay connected

- Take part in all tutorials
- Don't miss a lecture
- Keep up to date with the work

2

Take Action

- Deal with your problems as they come up
- Don't postpone!

Lecturers, Tutors and Student Advisors are here for you!

BSc Degrees in NAS requiring only one semester of math

BSc Biochemistry

BSc Biological Sciences

BSc Biotechnology

BSc Chemistry

BSc Culinary Science

BSc Ecology

BSc Entomology

BSc Environmental Sciences

BSc Food Science

BSc Genetics

BSc Geography

BSc Geoinformatics (and WTW148)

BSc Human Genetics

BSc Human Physiology

BSc Human Physiology, Genetics and Psychology

BSc Microbiology

BSc Nutrition

Degrees in other Faculties requiring WTW134/WTW114, but not more than one year mathematics (EBIT, EMS, Education)

BIT

**BSc Computer Science
(an option)**

**BSc Construction
Management**

**BSc Information and
Knowledge Systems**

BSc Quantity Surveying

BSc Real Estate

BCom Economics

**BEd Intermediate
phase**

There are more degrees, which allow WTW114 or WTW134 as electives, i.e. you can use the credits earned in WTW133+WTW143 or WTW133+WTW144

BEd degree: an option?

Indeed, it is. In fact, possibly a good one.

After completing successfully your first year you can continue with BEd with any of the following subjects

- Biology (Senior phase) +
Mathematics (Intermediate phase)
- Mathematics (Senior or Intermediate Phase) +
Science (Senior or Intermediate Phase)

If you have BEd with any two of Biology, Maths or Science you will not need to look for a job, jobs will be looking for you. If you are good, this might be a start of a sky rocketing career in Education.

MISCONCEPTIONS

- **WTW133/5 is on school maths. I have done it already. There is nothing much more required to be successful. NOT TRUE!**
The admission requirement of WTW114 is 70% in matric. Yet, half of the students do not get through first year.
You need much more than “polishing up” your school maths.
You need to master and understand all the content.
- **I did not learn well this topic, but I have a valid excuse (being sick, bus late, family problems, etc.). Hence, I should not be penalized for not knowing it. VERY MISLEADING!**
You can be excused from an activity or provided opportunity to repeat it, but not from learning the content.
You need to put an extra effort to catch up.
We are here to support you, but it is your responsibility.
Academic credit is earned only through academic performance.

HOW TO BE SUCCESSFUL: DON'Ts

- Do not postpone the study to the day before the test/exam.
- Do not use old test/exam papers as a study material. These are useful only for practice after you have learned a topic.
- Do not try to memorize memoranda. It is pointless. You will not get the same question.
- Do not attempt to learn recipes rather focus understanding.
- Do not miss any learning opportunity: lecture, tutorial, practical, consultation.
- Do not leave a tutorial/practical before completing all tasks.
- Do not disregard the low mark of today's test and think next time you will perform better. To expect a different outcome while you do the same thing, is unreasonable.

Change your approach

HOW TO BE SUCCESSFUL: DOs

- Change your attitude from one of being a school child to one of being a University student. Take responsibility for your studies. Leave bad school study habits behind.
- Take ownership of your studies. The decision to study is yours. The study programme is your choice. You should (intellectually) enjoy it.
- Set your goal to excellence rather than mediocracy (e.g. 50%) and perform accordingly.
- Do the work of today, today and not leave it for tomorrow. Mathematics cannot be learned fast (e.g. the day before the test). It is only learned through continuous long term sustained effort.
- Engage meaningfully with all activities (rather than just being there).
- Use your resources: talk to your lecturer, your tutor, your student adviser.

I feel overwhelmed, I am struggling, I am not coping. What shall I do?

- Struggle is part of the study process. There is no meaningful achievement without a struggle.
- Keep the bigger picture in mind, but focus on one problem at a time.
- If you struggle, but do not achieve, seek help. You are not alone. The struggle is yours, so is the achievement. However, we are here to support you all the way.
 - Campus Adviser: time management, study skills
 - Lecturers, tutors: understanding concepts, mastering technical skills, dealing with school knowledge gaps.
- Orientation and re-direction (this is for later)

Conclusion

- Exams and grades are temporary, but education is permanent.
- Make sure that your permanent landing is your place of talent and passion.
- Good luck with your studies and best wishes for making the choices, which will bring you to success.