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| Faculty | Natural Sciences | | |
| Home Department | Mathematics and Applied Mathematics | | |
| Module Topic | Differential Calculus | | |
| Generic Module Name | Differential Calculus 103 | | |
| Alpha-numeric Code | MAT103 | | |
| NQF Level | 5 | | |
| NQF Credit Value | 15 | | |
| Duration | Year | | |
| Proposed semester to be offered | Both semesters | | |
| Programmes in which the module will be offered | BSc (Mathematical and Statistical Sciences) (3227) BSc (Chemical Sciences) (3220) BSc (Physics Sciences) (3233) BSc (Computer Science) (3221) | | |
| Year level | 1 | | |
| Main outcomes: | <p>On completion of this module students should be able to:</p> <ul style="list-style-type: none"> • Understand the basic ideas concerning functions, their graphs, and ways of transforming and combining them • Appreciate the basic ideas of the number system, including complex numbers. • Understand the limit concept, continuity and the definition of the derivative, with an emphasis on meanings in different mathematical contexts. • Apply differentiation techniques. • Use the derivative in solving real world problems. <p>NOTE: Students who require additional assistance are placed onto MAT103 from MAT105 midway through the first semester. Placement is based on performance in MAT105; it is not possible to register for MAT103 at the start of the academic year.</p> | | |
| Main content: | <ul style="list-style-type: none"> • Sets and real numbers • Trigonometry • Complex variables • The coordinate system and straight lines • Function characteristics and representation • Main types of functions that occur in calculus • Vectors • Limits and continuity • The derivative of a function • Differentiation rules covering all functions • Implicit differentiation • Curve sketching • Related rates and optimization <p>While introducing new concepts, emphasis is on the integration and infusion of concepts and techniques learnt at a lower level.</p> | | |
| Pre-requisite modules | None | | |
| Co-requisite modules | None | | |
| Prohibited module Combination | None | | |
| Breakdown of Learning Time | Hours | Timetable Requirement per | Other teaching modes that does not |

| | | week | | require time-table |
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| Contact with lecturer / tutor: | 39 | <i>Lectures p.w.</i> | 3 | |
| Assignments & tasks: | 15 | <i>Practicals p.w.</i> | 3 | |
| Assessment | 15 | <i>Tutorials p.w.</i> | 1 | |
| Practicals: | 39 | | | |
| Selfstudy | 29 | | | |
| Other: Please specify | 13 | | | |
| Total Learning Time | 150 | | | |
| Methods of Student Assessment | Continuous Assessment (CA): 50% Final Assessment (FA): 50% | | | |
| Assessment Module type | Continuous and Final Assessment (CFA) | | | |