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| <b>Faculty</b>  | Natural Sciences   |  |  |
| <b>Home Department</b>                                | Earth Sciences   |  |  |
| <b>Module Topic</b>                                   | Igneous and Metamorphic Petrology, Economic Geology and Exploration Geochemistry   |  |  |
| <b>Generic Module Name</b>                            | Geology 321  |  |  |
| <b>Alpha-numeric Code</b>                             | APG321   |  |  |
| <b>NQF Level</b>                                      | 7  |  |  |
| <b>NQF Credit Value</b>                               | 30   |  |  |
| <b>Duration</b>                                       | Semester   |  |  |
| <b>Proposed semester to be offered.</b>               | Second Semester  |  |  |
| <b>Programmes in which the module will be offered</b> | BSc (Applied Geology) (3214, 3011)   |  |  |
| <b>Year level</b>                                     | 3  |  |  |
| <b>Main Outcomes</b>                                  | <p>On completion of this module students should be able to:</p> <ul style="list-style-type: none"> <li>Recognize igneous and metamorphic rocks and associated textures in hand specimen and under the microscope.</li> <li>Relate the changes in the mineralogy of igneous rocks to the variation in the chemistry of the rocks.</li> <li>Describe the origin of igneous and metamorphic rocks and associated textures, as well as the various igneous and metamorphic rock-forming processes.</li> <li>Describe the principles of concentration of mineral deposits in the context of various geological processes.</li> <li>Explain the occurrence of various genetic types of ore deposits in relation to associated host rocks, mineralogy of ores, ore grade and geological setting.</li> <li>Explain ore deposit formation and various geological processes as well as ore deposit exploration and evaluation.</li> <li>Describe the concepts in exploration geochemistry and their application to ore deposit exploration.</li> <li>Acquire, analyze and interpret geochemical data used in minerals exploration</li> <li>Describe element dispersion and isotopic fractionation and apply this knowledge to ore deposits studies.</li> </ul> |  |  |
| <b>Main Content</b>                                   | <ul style="list-style-type: none"> <li>Formation of igneous and metamorphic rocks</li> <li>Classification of igneous and metamorphic rocks</li> <li>Introduction to the genetic classification and formation of ore deposits.</li> <li>Magmatic, hydrothermal and sedimentary ore deposits and ore deposit models.</li> <li>Concepts of mineral exploration.</li> <li>Introduction to exploration geochemistry</li> </ul>  |  |  |
| <b>Pre-requisite modules</b>                          | APG231 and APG232 and APG233   |  |  |
| <b>Co-requisite modules</b>                           | None   |  |  |
| <b>Prohibited module Combination</b>                  | None   |  |  |
| <b>Breakdown of Learning Time</b>                     | <b>Hours</b>   | <b>Time-table Requirement per week</b> | <b>Other teaching modes that does not require time-table</b> |
| <i>Contact with lecturer / tutor:</i>                 | 42   | Lectures p.w.                          | 3  |

|                                     |   |                 |   |  |
|-------------------------------------|---|-----------------|---|--|
| <i>Assignments &amp; tasks:</i>     | 60  | Practicals p.w. | 1 |  |
| <i>Practicals:</i>                  | 84  | Tutorials p.w.  | 0 |  |
| <i>Assessments</i>                  | 30  |                 |   |  |
| <i>Selfstudy</i>                    | 84  |                 |   |  |
| <i>Other:</i>                       | 0   |                 |   |  |
| <b>Total Learning Time</b>          | 300   |                 |   |  |
| <b>Method of Student Assessment</b> | Continuous Assessment (CA): 50%<br>Final Assessment (FA): 50% |                 |   |  |
| <b>Assessment Module type</b>       | Continuous and Final Assessment (CFA)                         |                 |   |  |