

# University of Pretoria Yearbook 2020

## Process heat transfer and control 312 (NPB 312)

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| <b>Qualification</b>          | Undergraduate                                                                                           |
| <b>Faculty</b>                | <a href="#">Faculty of Engineering, Built Environment and Information Technology</a>                    |
| <b>Module credits</b>         | 16.00                                                                                                   |
| <b>Programmes</b>             | <a href="#">BEng Metallurgical Engineering</a><br><a href="#">BEng Metallurgical Engineering ENGAGE</a> |
| <b>Prerequisites</b>          | No prerequisites.                                                                                       |
| <b>Contact time</b>           | 1 tutorial per week, 2 lectures per week                                                                |
| <b>Language of tuition</b>    | Module is presented in English                                                                          |
| <b>Department</b>             | Materials Science and Metallurgical Engineering                                                         |
| <b>Period of presentation</b> | Semester 1                                                                                              |

### Module content

Elements of metallurgical process control. Introduction to process instrumentation. Control loops, identification of controlled and manipulated variables and disturbances. Principles of proportional integral controller, tuning of PID controllers. Principles of steady-state and transient heat transfer. Transient and steady-state heat transfer in metallurgy (formation of freeze layers, heating and cooling of components). Introduction to the numerical solution to steady-state and transient heat transfer problems.

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