Module Descriptions

A **module** is a self-contained **learning unit** within a higher education program that includes thematically related courses and is assigned a **fixed number of credits**. It follows specific **learning objectives**, includes an **assessment component**, and contributes to achieving the qualifications of a degree program. In some countries, “modules” are also named “courses”.

Please provide a module description for each module. In addition to the compulsory and elective modules, this also includes credited internships and the final thesis.

Please summarize all module descriptions in one document (Module Handbook) and create a table of contents so that the modules can be found easily.

Module designation	Mathematics for Chemistry
Semester(s) in which the module is taught	2
Person responsible for the module	*Dr. Suwardi*
Language	*Indonesia*
Relation to curriculum	*Compulsory ~~/ elective / specialisation~~*
Teaching methods	*Lecture, discussion, project*
Workload (incl. contact hours, self-study hours)	*(Estimated) Total workload:* *100 minutes/week for class learning*
Credit points	*2 sks (3.2 ECTS)*
Required and recommended prerequisites for joining the module	-

<table>
<tr><td>Module objectives/intended learning outcomes</td><td>On successful completion of the course students should be able to:
- understand the use of numbers and measurement techniques in scientific and engineering contexts, and are able to apply basic numerical methods
- read, write, and use mathematical symbols and functions to solve problems
- formulate and solve various types of algebraic equations
- perform differentiation and interpret its meaning in scientific and engineering contexts.
- calculate integrals of single-variable functions and apply them to various scientific problems
- master the concepts and techniques of multivariable calculus for technical and scientific applications.
- model and solve basic ordinary differential equations (ODEs) in various contexts
- explain matices, and determinan
- solve large-scale systems of linear equations efficiently
- analyze and interpret experimental data quantitatively.</td></tr>
<tr><td>Content</td><td>1. Numbers, measurements, and numerical mathematics
2. Mathematical symbols and mathematical functions
3. Completion of algebraic equations
4. Mathematical functions and differential calculus
5. Integral Calculus
6. Calculus with several variables
7. Differential equations
8. Operators, matrices, and determinan
9. Completion of simultaneous algebraic equations
10. Processing experimental data</td></tr>
<tr><td>Examination forms</td><td>Essay, project report and presentation, written tests</td></tr>
<tr><td>Study and examination requirements</td><td>Minimum attendance at lectures is 75% and lab work is 100%
Final score (NA) is calculated as follows:
<table><tr><th>Learning Outcome</th><th>Weight (%)</th><th>Technique of Assesment</th></tr><tr><td>1</td><td>5</td><td>Participation</td></tr><tr><td>1</td><td>5</td><td>Quizz/ Task</td></tr><tr><td>3</td><td>50</td><td>Project</td></tr><tr><td>4</td><td>20</td><td>Mid-term Written Test</td></tr><tr><td>5</td><td>20</td><td>Final Exam Written Test</td></tr></table></td></tr>
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Reading list	Barrante, J. R. (1998). Applied Mathematics for Physical Chemistry. New Jersey: Prentice Hall. Robert G. Mortimer, 2005, Mathematics for Physical Chemistry, Elsevier Inc. Kreyszig, Erwin. (1994). Advanced Engineering Mathematics. New York : John Wiley. Boas, Marry. L. (1996). Mathematics for Physical Sciences. New York: John Wiley. Doggett, Sutcliffe (1996). Mathematics for chemistry, Harlow, Longman

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