Module designation	*Numerical Methods*
Semester(s) in which the module is taught	*6*
Person responsible for the module	*Sahid, M.Sc*
Language	*Bahasa Indonesia*
Relation to curriculum	*Compulsory course*
Teaching methods	*150 minutes lectures and 180 minutes structured activities per week.*
Workload (incl. contact hours, self-study hours)	*Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes self-study per week for 16 weeks.*
Credit points	*3*
Required and recommended prerequisites for joining the module	*E.g. Algebra 101…* *E.g. existing competences in ...*
Module objectives/intended learning outcomes	*After taking this course the students have ability to:* *CO1. Explain the meaning of numerical methods and the importance of numerical methods in solving mathematical problems* *CO2. Explain the concept of errors and concepts related to errors in numerical computing, both theoretically and practically* *CO3. Use special math software (Euler Maths Toolbox, Octave, SCILAB, or MATLAB, etc.) to implement algorithms in numerical methods* *CO4. Using a numerical method that is suitable for determining the completion of a system of linear equations (SPL)* *CO5. Using a numerical method that is suitable for calculating the approximation solution of a nonlinear equation* *CO6. Using a numerical method that is suitable for calculating the approximation value of a function (interpolation)* *CO7. Using a numerical method that is suitable for calculating the approximation solution of derivative* *CO8. Using numerical methods that are suitable for calculating the aproximation solution of integral* *CO9. Using the numerical method that is suitable for calculating the approximation solution to ordinary differential equations (initial value problem)*

Content	*The course discusses about errors in numerical approximation, numerical system solving of linear equations, numerically almost non-linear root equations, numerical interpolation, degradation and integration, and numerical solving of ordinary differential equations (initial value problems). Some numerical methods for solving mathematical problems are introduced in this course. There is a practical activity using a computer program (Euler Maths Toolbox, Octave, SCILAB, or MATLAB, etc.) to implement algorithms and solve numerically related mathematical problems.*
Examination forms	*CO1: Attitude assessment is carried out at each meeting by observation and / or self-assessment techniques using the assumption that basically every student has a good attitude.*
Study and examination requirements	*The student is given a value of very good or not good attitude if they show it significantly compared to other students in general. The result of attitude assessment is not a component of the final grades, but as one of the requirements to pass the course. Students will pass from this course if at least have a good attitude.*

The final mark will be weight as follow:

No	CO	Assessment Object	Assessment Technique	Weight
1	CO 1	a. Presentation b. Discussion	Observation	5% 10%
2	CO 2, CO 3, CO 4	a. Individual assignment b. Group assignment c. Quiz d. Midterm e. Final test	Written	10% 10% 20% 20% 25%
		Total		100%

Reading list	1. *Pengantar Komputasi Numerik dengan MATLAB (2005) oleh Sahid (Penerbit Andi Yogyakarta)* 2. *Handout Metode Numerik (Sahid, 2008-2009, FMIPA UNY)* 3. *Applied Numerical Methods with Matlab for Engineers and Scientists, third edition (2012) oleh Steve Chapra. (The McGraw-Hill Companies, Inc.)* 4. *Numerical Analysis, 9 th edition (2011), oleh Richard L. Burden & J. Douglas Faires. (Brooks/Cole, Cengage Learning.)*