MODULE HANDBOOK

Module Name:	Numerical Methods
Module Level:	Sarjana (S-1) / Bachelor
Abbreviation, if applicable:	8420203007
Sub-heading, if applicable:	-
Course included in the module, if applicable:	-
Semester/term:	4/ Second year
Module Coordinator(s):	Dr. Yusuf Fuad, M.App. Sc
Lecturer(s):	Dian Savitri, M.Si Dimas Avian Maulana, M.Si.
Language:	Indonesia
Classification within the curriculum:	Compulsory course/ ~~elective studies~~
Teaching format/class hours per week during the semester	Teaching format: lectures, tutorial assignment, and individual study. 3 x 170 minutes = 510 minutes = 8.5 hours lectures
Workload:	15 weeks per semester consisting of: • 2.5 hours lectures (3 x 50 minutes) per week, • 3 hours tutorial assignments (3 x 60 minutes) per week, • 3 hours individual study (3 x 60 minutes) per week, Total workload : 14x3x170 minutes = 7,140 minutes = 4.76 ECTS*
Credit Point:	3
Requirements:	Intergal Calculus
Learning Goals:	**Knowledge** CLO-1: Demonstrate mathematical thinking and insight in solving simple mathematical problems with numerical approaches related to sources of errors, the concept of precision accuracy, approximation of the roots of non-linear equations, polynomial interpolation, numerical derivatives and numerical integral. CLO-2: Formulate problems related to sources of errors, the concept of precision accuracy, approximation of the roots of non-linear equations, polynomial interpolation, numerical derivatives and numerical integral.

<table>
<tr><td></td><td>CLO-3: Implement of mathematical numerical approaches related to approximation of the roots of non-linear equations, polynomial interpolation, numerical derivatives and numerical integral.
Skill
CLO-2: Implement basic principles of numerical method to solve simple mathematics problems with a numerical approach and its application</td></tr>
<tr><td>Content:</td><td>Learn basic concepts of approach and Error Analysis, approximation of the roots of non linear equations by various methods, determines value by interpolation, calculating numerical derivatives, and numerical integration.</td></tr>
<tr><td>Study/exam achievements</td><td>

This lecture materials provided with lectures, independent tasks, and discussions. To improve understanding of the material, students were given the task in the form of individual tasks and task groups. Exam in the subject of numerical methods include UTS and UAS. On this subject there is a soft skill assessment.
Students are considered competent and pass if the final score calculated from the score of midterm exam, assignments, participation, and final exam is at least 55 or C.
Final score is calculated as follows:
20% midterm exam + 30% assignments + 20% participation + 30% final exam
Final index is defined as follow:

<table>
<tr><th>Index</th><th>Converted Score</th><th>Score Range</th></tr>
<tr><td>A</td><td>4.00</td><td>$85 \leq A \leq 100$</td></tr>
<tr><td>A-</td><td>3.75</td><td>$80 \leq A-$ <85</td></tr>
<tr><td>B+</td><td>3.50</td><td>$75 \leq B+$ <80</td></tr>
<tr><td>B</td><td>3.00</td><td>$70 \leq B$ <75</td></tr>
<tr><td>B-</td><td>2.75</td><td>$65 \leq B-$ <70</td></tr>
<tr><td>C+</td><td>2.50</td><td>$60 \leq C+$ <65</td></tr>
<tr><td>C</td><td>2.00</td><td>$55 \leq C$ <60</td></tr>
<tr><td>D</td><td>1.00</td><td>$40 \leq D$ <55</td></tr>
<tr><td>E</td><td>0.00</td><td>$0 \leq E$ <40</td></tr>
</table>
</td></tr>
<tr><td>Forms of Media</td><td>Slides and LCD projectors, whiteboard</td></tr>
<tr><td>Literature</td><td>

Chapra Steven C, Canale Raymond P, 2002, Numerical Methods for Engineers, Fourth Edition, Mc Graw Hill
Fuad, Y. 2010. Metode Numerik I. Unipress IKIP Surabaya.
Fink, K.K., Mathews H.J. 2004.Numerical Methods using Matlab 4th Edition. New Jersey: Pearson Education Inter.
Atkinson, K. 2003. Elementary Numerical Analysis3rd Edition, John Wiley and Sons.

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	5. Fisher, M.E. 1985. Introductory Numerical Methods for Scientists and Engineers, Revised Edition. Department of Mathematics, The Univesity of Western Australia. 6. Gerald, C.F. and Weatley, P.O. 1984. Applied Numerical Analysis. Addison Wesley.. Springer Netherlands. 7. Patel, Vithal A., 1994. *Numerical Analysis.* Harcourt Brace College Publishers. Fort Worth.
Note	*Total hours per 1 credit in 1 semester={(1 credit x 170 minutes x 14 weeks)/60 minutes}=39,67 hours. Each ECTS equals with 25 hours therefore 1 credit in 1 semester equals 1,59 ECTS.