MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCE
UNDERGRADUATE PROGRAM OF MATHEMATICS
Ketintang Campus, C8-C9 Buildings of FMIPA, Surabaya
Email: s1-mat@unesa.ac.id

Module Handbook

Module Name :	*Metode Numerik* Numerical Methods
Module level :	Bachelor degree/Undergraduate Program
Course Code :	8420203007
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	4th/ Second year
Module coordinator(s)	Dr. Yusuf Fuad, M.App. Sc
Lecturer(s):	Dr. Dian Savitri, M.Si Budi Priyo Prawoto, M.Si. Dimas Avian Maulana, M.Si.
Language:	Bahasa Indonesia (Indonesian Language)
Classification within the curriculum:	Compulsory/ ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (*sks* or credit unit*)
Workload :	3 x 50 minutes lectures, 3 x 60 minutes structured activity, and 3 x 60 minutes individual activity per week, 14 weeks per semester 119 total hours per semester ~ 4.77 ECTS**
Credit Unit:	3 credit unit (4.77 ECTS)
Requirements:	Integral Calculus

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Learning goals/competencies:	**Knowledge** CLO-1 : Able to 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 : Able to 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. CLO-3 : Able to implement of mathematical numerical approaches related to approximation of the roots of non-linear equations, polynomial interpolation, numerical derivatives and numerical integral. **Skill** CLO-4 : Able to implement basic principles of numerical method to solve simple mathematics problems with a numerical approach and its application
Content	This course discusses about the 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. Lecture activities are carried out in a student center with discussions, observations, project assignments, and presentations

Attribute Soft skill:	Active communication; Discipline; Collaboration; Responsibility; and Argumentation in class
Study/exam achievements:	The final grade (*NA*) is calculated based on the following ratio:

Assessment Components	Percentage of contribution
Participation	20%
Assignment	30%
Mid-semester test	20%
Final semester test	30%

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<table>
<tr><td></td><td>Grade conversion of 0-100 scale into 0-4 scale is set as below:
<table>
<tr><th>Letter</th><th>Number</th><th>Grade Interval</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>Learning Methods :</td><td>Skills or competence learning outcomes can be achieved by Practicum activity; Student-centered approach; project-based learning; lecturer and discussion; and presentations (structured activities)</td></tr>
<tr><td>Form of Media:</td><td>Power point slides; video; worksheets, and textbooks</td></tr>
<tr><td>Literature (primary references):</td><td>1. Chapra Steven C, Canale Raymond P, 2002, Numerical Methods for Engineers, Fourth Edition, Mc Graw Hill
2. Fuad, Y. 2010. Metode Numerik I. Unipress IKIP Surabaya.
3. Fink, K.K., Mathews H.J. 2004.Numerical Methods using Matlab 4th Edition. New Jersey: Pearson Education Inter.
4. Atkinson, K. 2003. Elementary Numerical Analysis3rd Edition, John Wiley and Sons.
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.</td></tr>
<tr><td>Notes:</td><td>*1 credit unit or sks in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research,
Technology, and Higher Education No. 50 Year 2018.</td></tr>
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	**1 credit unit or *sks* = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2019