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 :	*Geometri Fraktal* Fractal Geometry
Module level :	Bachelor degree/Undergraduate Program
Course Code :	4420103044
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	5th/ third year
Module coordinator(s)	Prof. Dr. Dwi Juniati, M.Si
Lecturer(s):	Prof. Dr. Dwi Juniati, M.Si Muhammad Jakfar, S.Si., 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:	Geometry

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Learning goals/competencies:	**Skill (SKI-4)** CLO-1: Implement methods of forming fractal geometries, calculating fractal geometry dimensions in computer programs. **Competences (COM-2)** CLO-2: Solve fractal geometry problems using technology. **Attitude and Social (SOC-2)** CLO-3: Showing responsibility for work in the field of expertise independently, having a lifelong willingness to learn, and having the courage to make decisions when working on tasks related to application of forming and determining fractal geometry dimensions.
Content	This course discusses Definition of fractals and fractal geometry, methods of forming fractal geometries, calculating fractal geometry dimensions and application of forming and determining fractal geometry dimensions. 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 ≤ A ≤ 100</td></tr>
<tr><td>A-</td><td>3,75</td><td>80 ≤ A- < 85</td></tr>
<tr><td>B+</td><td>3,50</td><td>75 ≤ B+ < 80</td></tr>
<tr><td>B</td><td>3,00</td><td>70 ≤ B < 75</td></tr>
<tr><td>B-</td><td>2,75</td><td>65 ≤ B- < 70</td></tr>
<tr><td>C+</td><td>2,50</td><td>60 ≤ C+ < 65</td></tr>
<tr><td>C</td><td>2,00</td><td>55 ≤ C < 60</td></tr>
<tr><td>D</td><td>1,00</td><td>40 ≤ D < 55</td></tr>
<tr><td>E</td><td>0,00</td><td>0 ≤ E < 40</td></tr>
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<tr><td>Learning Methods :</td><td>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. Barnsley M.,1993, Fractal Everywhere, Academic Press.
2. Falconer,K., 2003, Fractal Geometry : Mathematical Foundations and Its Applications, John Wiley and Sons.
3. Gerald Edgar, 1990, Measure, Topology, and Fractal Geometry, Springer-Verlag,
4. Juniati,D., 2015, Geometri Fractal dan Aplikasinya, Surabaya.
5. Pike, A.,2007, Modeling Plants with Lindenmayer Sistems, SFU Computing Science, CMPT 461
6. Prusinkiewicz P, Hanan J,1989, Lindenmayer systems, fractals, and plants. Lecture Notes in Biomathematics Springer-Verlag:Berlin.
7. Prusinkiewicz, Przemyslaw and Lindenmayer, Aristid, 2004, The Algoritmic Beauty of Plants, Springer Verlag.New York.</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