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### Module Handbook

Module Name :	<i>Desain Eksperimen</i> Design of Experiment
Module level :	Bachelor degree/Undergraduate Program
Course Code :	4420103114
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	4 <sup>th</sup> / second year
Module coordinator(s)	Rudi Artiono, M.Si.
Lecturer(s):	Rudi Artiono, M.Si.
Language:	Bahasa Indonesia (Indonesian Language)
Classification within the curriculum:	<del>Compulsory</del> / Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures ( <i>sks</i> 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:	None



<p>Learning goals/competencies:</p>	<p><b>Competency (KNO-2) : Identifying and explaining the characteristics of statistical concepts for experimental design</b></p> <ul style="list-style-type: none"> <li>• CLO-1: Explain about t-test, one-factor ANOVA, two-factor ANOVA, complete block design, Latin square design, Latin Graeco square design, Incomplete Block Design, 2k Design, Blocking and Confounding 2k, design 2 Partial k, 3k design, regression analysis, response surface analysis and split plot design</li> </ul> <p><b>Skill (SKI-4) : Implementing simple mathematical procedures in computer programs.</b></p> <ul style="list-style-type: none"> <li>• CLO-2: implementing mathematical knowledge to operate mathematics software</li> </ul> <p><b>Competencies (COM-2): Generating ideas used for completing mathematical tasks and to communicate them either in writing or orally, in accordance with scientific principles.</b></p> <ul style="list-style-type: none"> <li>• CLO-3: Apply t-test, one-factor ANOVA, two-factor ANOVA, complete block design, Latin square design, Latin Graeco square design, Incomplete Block Design, 2k Design, Blocking and Confounding 2k, design 2 Partial k, 3k design, regression analysis, response surface analysis and split plot design in daily life problems.</li> </ul> <p><b>Competencies (COM-3): Solving mathematical problems using technology</b></p> <ul style="list-style-type: none"> <li>• CLO-4: using software statistics for regression analysis and other experimental design</li> </ul> <p><b>Social (SOC-2): Showing responsibility for work in the field of expertise independently, having a lifelong willingness to learn, and having the courage to make decisions.</b></p> <ul style="list-style-type: none"> <li>• CLO-5: Showing responsibility for completing the assignment or project of design of experiment on time.</li> </ul>
<p>Content</p>	<p>This Course Studying about hypothesis testing, t-test, one-factor ANOVA, two-factor ANOVA, complete block design, Latin square design, Latin Graeco square design, Incomplete Block Design, 2k Design, Blocking and Confounding 2k, design 2k Partial, 3k design, regression analysis, response surface analysis and split plot design. Learning is done by using lecture methods, question and answer, group discussions, and assignments.</p>



Attribute Soft skill:	Active communication; Discipline; Collaboration; Responsibility; and Argumentation in class.																																								
Study/exam achievements:	<p>The final grade (<i>NA</i>) is calculated based on the following ratio:</p> <table border="1" data-bbox="539 524 1347 851"> <thead> <tr> <th>Assessment Components</th> <th>Percentage of contribution</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td>20%</td> </tr> <tr> <td>Assignment</td> <td>30%</td> </tr> <tr> <td>Mid-semester test</td> <td>20%</td> </tr> <tr> <td>Final semester test</td> <td>30%</td> </tr> </tbody> </table> <p>Grade conversion of 0-100 scale into 0-4 scale is set as below:</p> <table border="1" data-bbox="547 891 1417 1357"> <thead> <tr> <th>Letter</th> <th>Number</th> <th>Grade Interval</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>4,00</td> <td><math>85 \leq A \leq 100</math></td> </tr> <tr> <td>A-</td> <td>3,75</td> <td><math>80 \leq A- &lt; 85</math></td> </tr> <tr> <td>B+</td> <td>3,50</td> <td><math>75 \leq B+ &lt; 80</math></td> </tr> <tr> <td>B</td> <td>3,00</td> <td><math>70 \leq B &lt; 75</math></td> </tr> <tr> <td>B-</td> <td>2,75</td> <td><math>65 \leq B- &lt; 70</math></td> </tr> <tr> <td>C+</td> <td>2,50</td> <td><math>60 \leq C+ &lt; 65</math></td> </tr> <tr> <td>C</td> <td>2,00</td> <td><math>55 \leq C &lt; 60</math></td> </tr> <tr> <td>D</td> <td>1,00</td> <td><math>40 \leq D &lt; 55</math></td> </tr> <tr> <td>E</td> <td>0,00</td> <td><math>0 \leq E &lt; 40</math></td> </tr> </tbody> </table>	Assessment Components	Percentage of contribution	Participation	20%	Assignment	30%	Mid-semester test	20%	Final semester test	30%	Letter	Number	Grade Interval	A	4,00	$85 \leq A \leq 100$	A-	3,75	$80 \leq A- < 85$	B+	3,50	$75 \leq B+ < 80$	B	3,00	$70 \leq B < 75$	B-	2,75	$65 \leq B- < 70$	C+	2,50	$60 \leq C+ < 65$	C	2,00	$55 \leq C < 60$	D	1,00	$40 \leq D < 55$	E	0,00	$0 \leq E < 40$
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Learning Methods :	Student-centered approach; project-based learning; lecturer and discussion; and presentations (structured activities)																																								
Form of Media:	Power point slides; video; worksheets, and textbooks																																								



<p>Literature (primary references):</p>	<ol style="list-style-type: none"> <li>1. Competency (KNO-2) : Identifying and explaining the characteristics of statistical concepts for experimental design</li> <li>2. CLO-1: Explain about t-test, one-factor ANOVA, two-factor ANOVA, complete block design, Latin square design, Latin Graeco square design, Incomplete Block Design, 2k Design, Blocking and Confounding 2k, design 2 Partial k, 3k design, regression analysis, response surface analysis and split plot design</li> <li>3. Skill (SKI-4) : Implementing simple mathematical procedures in computer programs.</li> <li>4. CLO-2: implementing mathematical knowledge to operate mathematics software</li> <li>5. Competencies (COM-2): Generating ideas used for completing mathematical tasks and to communicate them either in writing or orally, in accordance with scientific principles.</li> <li>6. CLO-3: Apply t-test, one-factor ANOVA, two-factor ANOVA, complete block design, Latin square design, Latin Graeco square design, Incomplete Block Design, 2k Design, Blocking and Confounding 2k, design 2 Partial k, 3k design, regression analysis, response surface analysis and split plot design in daily life problems.</li> <li>7. Competencies (COM-3): Solving mathematical problems using technology</li> <li>8. CLO-4: using software statistics for regression analysis and other experimental design</li> <li>9. Social (SOC-2): Showing responsibility for work in the field of expertise independently, having a lifelong willingness to learn, and having the courage to make decisions.</li> <li>10. CLO-5: Showing responsibility for completing the assignment or project of design of experiment on time.</li> </ol>
<p>Notes:</p>	<p>*1 credit unit or <i>sks</i> 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.</p> <p>**1 credit unit or <i>sks</i> = 1.59 ECTS according to Rector Decree of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2019</p>



**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](mailto:s1-mat@unesa.ac.id)**

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