<table>
<tr><td rowspan="2"></td><td colspan="4" align="center"><b>Universitas Negeri Surabaya<br>Faculty of Engineering,<br>Mechanical Engineering Education Undergraduate Study Program</b></td><td><b>Document Code</b></td></tr>
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## SEMESTER LEARNING PLAN

| Courses | | CODE | Course Family | Credit Weight | | SEMESTER | Compilation Date |
|---|---|---|---|---|---|---|---|
| **Mathematics II** | | 8320302064 | | T=2  P=0  ECTS=3.18 | | 2 | July 18, 2024 |

| AUTHORIZATION | SP Developer | Course Cluster Coordinator | Study Program Coordinator |
|---|---|---|---|
| | ....................................... | ....................................... | Ir. Wahyu Dwi Kurniawan, S.Pd., M.Pd. |

| Learning model | Case Studies |
|---|---|

| Program Learning Outcomes (PLO) | PLO study program that is charged to the course |
|---|---|
| | Program Objectives (PO) |
| | PLO-PO Matrix |

|  |  |
|---|---|
| | P.O |

| | PO Matrix at the end of each learning stage (Sub-PO) |
|---|---|

| P.O | Week | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

| Short Course Description | Use of specific integrals to find area, volume, arc length, center of gravity, moment of inertia, double integrals, matrices, systems of linear equations and their applications. |
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| References | Main : |
|---|---|

1. Baisuni , MH , 1986 , Kalkulus , Jakarta : Universitas Indonesia
2. Purcell dan Verberg,1992,Kalkulus dan Geometri Analitis, Jakarta : Erlangga
3. Stroud, KA, 1989, Matematika untuk Teknik, Alih bahasa: Erwin Sucipto, Jakarta Erlangga
4. Verberg, Purcell, Rigdon, 2007, Kalkulus, Jakarta : Erlangga

| | Supporters: |
|---|---|

| Supporting lecturer | Dr. Dian Savitri, S.Si., M.Si.<br>Tri Hartutuk Ningsih, S.T., M.T. |
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| Week- | Final abilities of each learning stage (Sub-PO) | Evaluation | | Help Learning, Learning methods, Student Assignments, [ Estimated time] | | Learning materials [ References ] | Assessment Weight (%) |
|---|---|---|---|---|---|---|---|
| | | Indicator | Criteria & Form | Offline ( offline ) | Online ( online ) | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | Students are able to communicate their understanding of indefinite integrals | Students can: · Explain indefinite integrals · Explain the basis and properties of integrals · Explain integration techniques · Explain substitution integrals · Explain trigonometric substitution integrals Explain partial integrals & integrals of rational split functions | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | | 0% |
| 2 | Students are able to communicate their understanding of definite integrals and their application to the area of land and volume of rotating objects, arc length | Students can: · Explain certain integrals · Explain its application to the area of land and volume of rotating objects, arc length · Convey ideas/questions | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | | 0% |
| 3 | Students are able to communicate their understanding of definite integrals and their application to the area of land and volume of rotating objects, arc length | Students can: · Explain certain integrals · Explain its application to the area of land and volume of rotating objects, arc length · Convey ideas/questions | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | | 0% |
| 4 | Students are able to communicate their understanding of the application of definite integrals, center of gravity, moment of inertia and pressure of liquids | Students can: · Formulate certain integrals in the form of applications of center of gravity, moment of inertia and liquid pressure | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | | 0% |
| 5 | Students are able to communicate their understanding of the application of definite integrals, center of gravity, moment of inertia and pressure of liquids | Students can: · Formulate certain integrals in the form of applications of center of gravity, moment of inertia and liquid pressure | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | | 0% |
| 6 | Students are able to communicate their understanding of the concept of double integrals and their applications | Students can: Formulate double integrals and their applications | **Criteria:** According to the Rubric | Lectures, discussions and questions and answers 2 X 50 | | | | 0% |
| 7 | Students are able to communicate their understanding of the concept of double integrals and their applications | Students can: Formulate double integrals and their applications | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | | 0% |
| 8 | USS (attached) | USS (attached) | **Criteria:** USS (attached) | USS (attached) 1 X 1 | | | | 0% |

| No | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | Students are able to communicate their understanding of ordinary differential equations | Students can: · Explain ordinary differential equations. Convey ideas/questions | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | 0% |
| 10 | Students are able to communicate their understanding of ordinary differential equations | Students can: · Explain ordinary differential equations. Convey ideas/questions | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | 0% |
| 11 | Students are able to communicate their understanding of ordinary differential equations | Students can: · Explain ordinary differential equations. Convey ideas/questions | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | 0% |
| 12 | Students are able to communicate their understanding of ordinary differential equations | Students can: · Explain ordinary differential equations. Convey ideas/questions | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | 0% |
| 13 | Students are able to communicate their understanding of matrices and determinants | Students can: · Explain matrices and determinants. Explain the types of matrices, inverses and determinants of matrices | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | 0% |
| 14 | Students are able to communicate their understanding of matrices and determinants | Students can: · Explain matrices and determinants. Explain the types of matrices, inverses and determinants of matrices. | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | 0% |
| 15 | Students are able to communicate their understanding of the System of Linear Equations for Liquid Pressure | Students can: Explain Systems of Linear Equations using the Gauss Elimination Method, Gauss – Jourdan Elimination, Inverse Matrix, Cramer and their applications | **Criteria:** According to the Rubric | Lectures, discussions, questions and answers 2 X 50 | | | 0% |
| 16 | | | | | | | 0% |

**Evaluation Percentage Recap: Case Study**

| No | Evaluation | Percentage |
|---|---|---|
| | | 0% |

**Notes**
1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the

course.

5. **Indicators for assessing**  ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria**  are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:**  Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:**  Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight**  is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.