



Universitas Negeri Surabaya
Faculty of Engineering,
Mechanical Engineering Undergraduate Study Program

Document Code

SEMESTER LEARNING PLAN

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|-----------------------------------|--|--------------------------|--|------------------------------|---|---|----|----|----|----|----|----|----|--|-----|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| Courses | CODE | Course Family | Credit Weight | | | SEMESTER | Compilation Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aerodynamics | 2120102001 | | T=2 | P=0 | ECTS=3.18 | 7 | July 18, 2024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AUTHORIZATION | SP Developer | | Course Cluster Coordinator | | | Study Program Coordinator | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | Ir. Priyo Heru Adiwibowo, S.T., M.T. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Short Course Description | PO Matrix at the end of each learning stage (Sub-PO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td rowspan="2" style="width: 5%;">P.O</td> <td colspan="16">Week</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td> </tr> </table> | | | | | | | | | | | | | | | | P.O | Week | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| P.O | Week | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| References | <p>Main :</p> <ol style="list-style-type: none"> 1. Grummy, A.W. 2014. Buku Ajar: Aerodinamika . Surabaya: Upress. 2. Fox and McDonald. 2012. Introduction to Fluid Mechanics: Eight Edition, SI Version. USA: John Wiley & Sons. 3. Barnard R.H. 1996. Road vehicle Aerodynamic Design: An Introduction. England: Longman. 4. Clancy L.J. 1975. Aerodynamics. London: A Pitman International Text. 5. Hucho, Wolf-Heinrich. 1986. Aerodynamics of road vehicles. London: Butterworth. 6. Katz, Joseph. 1995. Race car aerodynamics: Designing for speed. Cambridge: Robert Bentley, Inc. 7. Pope, Alan, and Harper, John, J. 1966. Low speed wind tunnel testing. New York: John Wiley & Sons. <p>Supporters:</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Supporting lecturer | Dr. A. Grummy Wailanduw, M.Pd., M.T. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|----|--|--|--|---|--|--|----|
| 1 | Students can explain the flow phenomenon around the bluff body | Can explain the flow phenomenon around the bluff body | Criteria: Compliance with the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 2 | Students can explain the flow phenomenon around the bluff body | Can explain the flow phenomenon around the bluff body | Criteria: Compliance with the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 3 | Students can explain fluid properties related to flow around a bluff body | Can explain fluid properties related to flow around the bluff body | Criteria: Compliance with the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 4 | Students can explain fluid properties related to flow around a bluff body | Can explain fluid properties related to flow around the bluff body | Criteria: Compliance with the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 5 | Students can explain dimensions and units | Can explain dimensions and units | Criteria: Compliance with the answer key | Lectures, questions and answers, discussions. 2 X 50 | | | 0% |
| 6 | Students can apply dimensional and similarity analysis to form dimensionless equations | Can apply dimensional and similarity analysis in forming dimensionless equations | Criteria: Compliance with the answer key | Lectures, questions and answers, discussions. 2 X 50 | | | 0% |
| 7 | Students can apply dimensional and similarity analysis to form dimensionless equations | Can apply dimensional and similarity analysis in forming dimensionless equations | Criteria: Compliance with the answer key | Lectures, questions and answers, discussions. 2 X 50 | | | 0% |
| 8 | Students can solve problems in the mid-semester exam script | Can solve problems in the mid-semester exam script | Criteria: 75-100% of students can do it | test, open close properties 2 X 50 | | | 0% |
| 9 | Students can apply Bernoulli's theorem to solve flow phenomena around bluff bodies | Can apply Bernoulli's theorem in solving flow phenomena around bluff bodies | Criteria: Work according to the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 10 | Students can apply Bernoulli's theorem to solve flow phenomena around bluff bodies | Can apply Bernoulli's theorem in solving flow phenomena around bluff bodies | Criteria: Work according to the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 11 | Students can calculate the aerodynamic forces acting on vehicles | Can calculate the aerodynamic forces acting on the vehicle | Criteria: According to the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 12 | | | | | | | 0% |
| 13 | Students can calculate the aerodynamic forces acting on vehicles | Can calculate the aerodynamic forces acting on the vehicle | Criteria: According to the answer key | Lectures, questions and answers, discussions 2 X 50 | | | 0% |
| 14 | Students can explain testing procedures with a wind tunnel | Can explain testing procedures with a wind tunnel | Criteria: according to the answer key | Lectures, questions and answers, discussions. 2 X 50 | | | 0% |

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|----|--|---|--|--|--|--|----|
| 15 | Students can explain testing procedures with a wind tunnel | Can explain testing procedures with a wind tunnel | Criteria: according to the answer key | Lectures, questions and answers, discussions. 2 X 50 | | | 0% |
| 16 | Students can explain testing procedures with a wind tunnel | Can explain testing procedures with a wind tunnel | Criteria: according to the answer key | Lectures, questions and answers, discussions. 2 X 50 | | | 0% |

Evaluation Percentage Recap: Case Study

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

Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Forms of assessment:** test and non-test.
- 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.
- 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.