


|  | | Universitas Negeri Surabaya Faculty of Engineering, Mechanical Engineering Education Undergraduate Study Program | | | | | Document Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|-----------------------|---|-------------------|-----------------------------------|--|-------------------------|--|-----|--|--|--|--|--|--|--|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| SEMESTER LEARNING PLAN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Courses | | CODE | Course Family | Credit Weight | | | SEMESTER | Compilation Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pumps and Compressors | | 8320302127 | | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 50px; height: 20px;"></td> <td colspan="16" style="text-align: center;">P.O</td> </tr> </table> | | | | | | | | P.O | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P.O | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PO Matrix at the end of each learning stage (Sub-PO) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="width: 30px; height: 20px;"></td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> | | | | | | | | | | | | | | | | | Week | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Week | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Short Course Description | This course is a continuation of the Thermodynamics I course which includes: Exergy, various variants of steam power systems, various variants of gas power systems and the basics of propulsion systems, various refrigeration systems and thermal pumps, main state equations for simple compressible substances, non-reacting gaside mixtures and psychrometrics, as well as reacting mixtures and combustion. After taking this course, students are expected to be able and skilled in applying engineering thermodynamics for modeling and analyzing various thermodynamic systems. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| References | Main : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1. Indra Herlamba Siregar, Pompa Centrifugal, 2014.Edisi Pertama Unipress. 2. Igor J. Karrasik, Pump Handbook, 2001, 3rd Edition, McGraw-Hill 3. Val S Lobanoff, CEntrifugal Pump, 1992, 2nd Edition, Butterworth-Heinemman 4. Tony Giampallo, Compressor Handbook,, 2009, CRC-Press | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Supporters: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Supporting lecturer | Dr. Soeryanto, M.Pd. Indra Herlamba Siregar, S.T., 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) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Students get a complete picture of the pump and compressor course | - | Criteria: - | Lectures 3 X 50 | | | 0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|----|---|---|-----------------------|------------------------------------|--|--|----|
| 2 | Students are able to identify the main components of a centrifugal pump | - | | Lectures and discussions 3 X 50 | | | 0% |
| 3 | Students understand the principles of hydraulics in pumps | - | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 4 | Students understand and are able to calculate the NPSH of a pump | - | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 5 | Students understand and are able to calculate the NPSH of a pump | | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 6 | Students understand the PUMP PERFORMANCE CHARACTERISTIC CURVE | - | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 7 | Students understand the PUMP PERFORMANCE CHARACTERISTIC CURVE | - | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 8 | Students achieve 75% learning completeness | - | Criteria: - | Test 3 X 50 | | | 0% |
| 9 | Students are able to select pumps | - | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 10 | Students are able to select pumps | - | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 11 | Students understand the principles of fluids in compressors | - | Criteria: - | Lectures and discussions 3 X 50 | | | 0% |
| 12 | Students understand the working principles of piston compressors | - | Criteria: - | Lectures and discussions 1 X 1 | | | 0% |
| 13 | | | | | | | 0% |
| 14 | | | | | | | 0% |
| 15 | | | | | | | 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.