

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

Document Code

| | | | | SE | EME | EST | ER | R LE | EAI | RN | ING | i Pl | | J | | | | | |
|-----------------------------|-------------|--|-----------------------------|--------------------------------------|---------------------------|-----------------------------|--------------------------|------------------------------|---------------------------|--|----------------------------|------------------------------|-------------------------|--------------------|--|-----------------|--------------------------|-----------------|-----------------------|
| Courses | | | | CODE | | | | Со | urse I | Famil | у | Cre | dit We | eight | | SEM | IESTER | Con | pilation |
| Kinemati | cs ai | nd Dynamics | | 212010 | 3033 | | | | | | | Т=3 | P=0 | ECT | S=4.77 | 1 | 3 | July | 18, 2024 |
| AUTHOR | IZAT | ION | | SP Developer | | | | Course Cluster Coordinator | | | nator | Study Program Coordinator | | | | | | | |
| | | | | | | | | | | | | | | | | lr. F | | | |
| Learning model | | Case Studies | | | | | | | | | | | | | | | | | |
| Program Learning | | PLO study pro | gram | that is | char | ged to | o the | cours | se | | | | | | | | | | |
| Outcom | | Program Obje | ctives | 6 (PO) | | | | | | Course Cluster Coordinator Study Program Coordinator Ir. Priyo Heru Adiwibowo, S.T., M.T. Veek 7 8 9 10 11 12 13 14 15 16 s, kinematics of particles, types of plane motion, Newton's working momentum in rigid objects, degrees of freedom of mechanisms, | | | | | | | | | |
| (PLO) | | PLO-PO Matrix | ¢ | | | | | | | | | | | | | | | | |
| | | P.O | | | | | | | | | | | | | | | | | |
| | | PO Matrix at the end of each learning stage (Sub-PO) | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | F | P.0 | | | | | Week | | | | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | | | | | | | | | | | | | | | | | | | |
| Short Course Descript | tion | Understanding a principle, princip determining spee | le of i | momentu | um in | partic | les, p | princip | le of | mome | ematic entum | s of p in rig | article: jid obj | s, type ects, c | s of pla legrees | ne mo of fre | otion, Ne eedom c | wton's f mec | s working hanisms, |
| Referend | ces | Main : | | | | | | | | | | | | | | | | | |
| | | Russel (Hirchorn Ferdinar Hill. | C, Hibb J. 190 nd P E | beler. 199 62. Kiner 3eer, E F | 95. Er matics Russe | nginee s and [I John | ringM Dynan ston S | lechan nics of Jr. 199 | iics : I Plan 98. V | Dynar e Mec ector | nics. F chanisi Mech | Prentic m . Mo anism | e Hall Graw for E | Hill Bo nginee | ook Con rs, Dyn | npany amics | , 3rd Ec | ition . | McGraw |
| | | Supporters: | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| Supporti lecturer | ing | Ir. Priyo Heru Ad Diah Wulandari, Ferly Isnomo Ab | S.T., M | M.T. | | | | | | | | | | | | | | | |
| Week- | eac stag | Final abilities of each learning stage (Sub-PO) Ir | | Evaluation | | | | Lea | | Help Learning, Learning methods, Student Assignments, [Estimated time] | | | | ma | Learning materials [References | | Assessment Weight (%) | | |
| | (Su | | | ndicator | | Crite | eria & | Form | ۱ | Offli offli | | 0 | Online | (onli | ne) | | 1 | | |
| (1) | | (2) | | (3) | | | (4) | | | (5 | 5) | | | (6) | | | (7) | | (8) |

| 1 Students are able be option the web as any of the mechanism Know the samples Criteria: Criteria: Methods web and web as and any of the problem that web as any of the mechanism Criteria: Criteria: Criteria: Compliance with assignments Lectures, and any of the problem that web asy of the problem that web asy of the mechanism 0% 2 Students are able to explain the mechanism Know the stages of web asy of the any of the stages of ubesping a mechanism Criteria: Compliance with and any of the symbols and units Criteria: Compliance with and any of the symbols and units Criteria: Compliance with any of the symbols and units 0% 0% 3 Students are able to use the basics of vectors in the complete and any of the symbols and of vectors with any of the symbols any of the symbols and of vectors with any of the symbols and of vectors with any of the symbols and of vectors with any of the symbols any of the symbols any of the symbols any of the symbols any of | | | | | | | |
|--|---|---|---|-----------------|---|--|----|
| Image: Students are able to use the basics of vectors Skilled in using vector discussions, used to use the basics of vectors Skilled in using vector discussions, used to use the basics of vectors Skilled in using vector discussions, used to use the basics of vectors Skilled in using vectors discussions, used to use the basics of vectors Skilled in using vectors discussions, used to use the basics of vectors Skilled in using vectors discussions, used to use the basics of vectors Skilled in using vectors discussions, used to vectors discussions, used to vectors with vectors | 1 | to explain their understanding of the problem that will be designed to design the | problem to be | Compliance with | discussions, questions and answers, exercises and assignments | | 0% |
| It use physical symbols and units quantities, symbols and units compliance with the answer key discussions, questions and answers, searcrises and assymmets discussions, questions and assymmets 4 Students are able to use the basic vectors site of vectors Identifying scalar quantities, scalar quantities, questions and assignments Criteria: Compliance with the answer key Lectures, discussions, questions and assignments 0% 5 Students are able of vectors Stilled in using vectors skilled in using vectors with scalar skilled in using vectors Criteria: Compliance with the answer key Lectures, discussions, questions and assignments 0% 6 Students are able vectors with scalar skilled in using vectors skilled in using vectors skilled in using corriteria: spatem Criteria: Compliance with the answer key spatem Lectures, discussions, questions and answers, severcises and ansymets assignments 0% | 2 | to explain their understanding of the stages in designing a | stages of | Compliance with | discussions, questions and answers, exercises and assignments | | 0% |
| a state the basics of vectors scalar and ovectors Compliance with the answer key ovectors discussions, and answers, exercises and assignments 3 x 50 discussions, and answers, exercises and 5 Students are able of vectors Skilled in using miting extor decomposition Criteria: Compliance with the answer key system Skilled in using miting and scalars Skilled in using miting and scalars Skilled plane Criteria: Compliance with the answer key system Skilled in using miting and scalars Skilled in using miting and scalars Skilled plane Criteria: Compliance with the answer key system Skilled in using miting and scalars Skilled plane Criteria: Compliance with the answer key system Skilled in using miting and scalars Skilled in using miting and skilled in using cortinates Skilled in using miting cortinates Skilled in using miting cortinates Skilled in using miting absolute and relative particle miting absolute and relative particle miting cortinates Skilled in using miting cortinates Skilled in using miting absolute and relative particle miting cortinates Skilled in using miting cortinates Skilled in using miting absolute and relative particle miting cortinates Skilled in using miting absolute and relative particle miting cortinates Skilled in using miting absolute and relative particle miting absolute and relativ | 3 | to use physical quantities, | quantities, symbols and | Compliance with | discussions, questions and answers, exercises and assignments | | 0% |
| to use the basics of vectorsvectors in the Carresian axis system Skilled in using multiplication of vectors with scalars Skilled in using motion on a flatCompliance with the answer key weith scalars Skilled in using Carresian skilled in using planeCompliance with the answer key weith scalars Skilled in using Carresian Skilled in using coordinates Skilled in using planeCriteria: Compliance with the answer key the answer key scalars compliance with the answer key the answer keyLectures, discussions, questions and answers, evercises an | 4 | to use the basics | scalar and vector quantities Drawing vectors Skilled in using addition, subtraction and resultant vectors Skilled in using vector | Compliance with | discussions, questions and answers, exercises and assignments | | 0% |
| to use particle motion on a flat planebetween adsolute and relative vectors Skilled in using polar coordinates Skilled in using polar absolute and reference axis systems Skilled in using coordinates Skilled in using polar absolute and reference axis systems Skilled in using absolute and reference axis systems Skilled in using coordinates Skilled in using polar coordinates Skilled in using polar etailed in using polar etailed in using absolute and reference axis systems Skilled in using coordinates Skilled in using polar coordinates Skilled in using polar etailed in using polar etailed in using coordinates Skilled in using coordinates Skilled in using polar coordinates Skilled in using polar doordinates Skilled in using polar doordinates Skilled in using polar doordinates Skilled in using polar doordinates Skilled in using polar doordinates Skilled in using polar doordinates Skilled in using motion reference axis systems Skilled in using absolute and relative particle motionCompliance with the answer key the answer keyLectures, ticscusions, questions and answers, exercises and answers, exercises and assignments 3 X 500%8Midtern ExamMidtern Exam0% | 5 | to use the basics | vectors in the Cartesian axis system Skilled in using multiplication of vectors with scalars Skilled in using multiplication of vectors with | Compliance with | discussions, questions and answers, exercises and assignments | | 0% |
| to use particle motion on a flat planebetween absolute and relative vectors Skilled in using Cartesian coordinates Skilled in using polar coordinates Skilled in using motion reference axis systems Skilled in using absolute and reference axis systems Skilled in using absolute and reference axis systems Skilled in using absolute and reference axis systems Skilled in using absolute and relative particle motionCompliance with the answer keydiscussions, questions and and assignments 3 X 508Midterm Exam0% | 6 | to use particle motion on a flat | between absolute and relative vectors Skilled in using Cartesian coordinates Skilled in using polar coordinates Skilled in using motion reference axis systems Skilled in using absolute and relative particle | Compliance with | discussions, questions and answers, exercises and assignments | | 0% |
| | 7 | to use particle motion on a flat | between absolute and relative vectors Skilled in using Cartesian coordinates Skilled in using polar coordinates Skilled in using motion reference axis systems Skilled in using absolute and relative particle | Compliance with | discussions, questions and answers, exercises and assignments | | 0% |
| | 8 | | | | 3 X 50 | | 0% |

| | | | | 1 | 1 | |
|----|--|---|--|--|---|----|
| 9 | Students are able to explain relative speed and relative acceleration | Skilled at explaining relative speed Skilled in explaining relative acceleration Skilled in explaining the speed relationship between two points on a rigid link Skilled in explaining the acceleration of a point on a link rotating about a fixed center with a constant radius Skilled in explaining the relative acceleration of two points on a rigid link | Criteria: Compliance with the answer key | Lectures, discussions, questions and answers, exercises and assignments 3 X 50 | | 0% |
| 10 | Students are able to explain relative speed and relative acceleration | Skilled at explaining relative speed Skilled in explaining relative acceleration Skilled in explaining the speed relationship between two points on a rigid link Skilled in explaining the acceleration of a point on a link rotating about a fixed center with a constant radius Skilled in explaining the relative acceleration of two points on a rigid link | Criteria: Compliance with the answer key | Lectures, discussions, questions and answers, exercises and assignments 3 X 50 | | 0% |

| 11 | Students are able to calculate and apply relative speed and relative acceleration | Skilled at calculating relative speed Skilled in calculating relative acceleration Skilled in calculating the speed relationship between two points on a rigid link Skilled in calculating the acceleration of a point on a link rotating about a fixed center with a constant radius Skilled in calculating the acceleration of a point on a link | Criteria: Compliance with the answer key | Lectures, discussions, questions and answers, exercises and assignments 3 X 50 | | 0% |
|----|---|--|--|--|--|----|
| 12 | Students are able to calculate and apply relative speed and relative acceleration | Skilled at calculating relative speed Skilled in calculating relative acceleration Skilled in calculating the speed relationship between two points on a rigid link Skilled in calculating the acceleration of a point on a link rotating about a fixed center with a constant radius Skilled in calculating the acceleration of a point on a link | Criteria: Compliance with the answer key | Lectures, discussions, questions and answers, exercises and assignments 3 X 50 | | 0% |
| 13 | Students are able to explain and calculate relative speed and relative acceleration in the application of various mechanisms | 1.Skilled in calculating relative speed applications 2.Skilled in calculating relative acceleration applications | Criteria: Compliance with the answer key | Lectures, discussions, questions and answers, exercises and assignments 3 X 50 | | 0% |

| 14 | Students are able to explain and calculate relative speed and relative acceleration in the application of various mechanisms | Skilled in calculating relative speed applications Skilled in calculating relative acceleration applications | Criteria: Compliance with the answer key | Lectures, discussions, questions and answers, exercises and assignments 3 X 50 | | 0% |
|----|---|---|--|--|--|----|
| 15 | Students are able to explain and calculate relative speed and relative acceleration in the application of various mechanisms | Skilled in calculating relative speed applications Skilled in calculating relative acceleration applications | Criteria: Compliance with the answer key | Lectures, discussions, questions and answers, exercises and assignments 3 X 50 | | 0% |
| 16 | Final Semester Examination (UAS) | | | 3 X 50 | | 0% |

Evaluation Percentage Recap: Case Study

No Evaluation Percentage

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.
- 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.
- 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, 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.