	Universitas Negeri Surabaya Vocational Faculty, D4 Transportation Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Railway	3930102061	Transportation	T=2	P=0	ECTS=3.18	4	July 16, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Dr. Ir. Dadang Supriyatno, MT.,IPU.,ASEAN Eng.	.....	Dr. Anita Susanti, S.Pd., M.T.

Learning model	**Case Studies**

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PO - 1	Students understand and understand the construction elements of buildings above and below the railroad

PLO-PO Matrix

P.O
PO-1

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
PO-1																

Short Course Description	This course provides an overview to students: This course provides an overview to students: History of the development of railroads in Indonesia and pavement construction, Definition of track, function of railroads, how to know the classification of roads based on travel speed, passing tonnage of axle load, types of rails, body dimensions railways, cross-sections of railways, introduces students to railway planning, including: Distribution of loads on railways, subsoil layers, sand caps, ballast, types of rails, forces acting on railways (forces centrifugal, train overturning force), railroad track geometrics (horizontal and vertical alignment) bottom and top construction planning, emplacement, crossings and types of money orders.

References

Main :

1. Dadang. 2004.BukuAjar Jalan Raya & KA.Surabaya:FT. Sipil Unesa.
2. Banks, J. H. 2002. Introduction to Transportation Engineering. MacGraw Hill. 2nd Edition. Boston. 502p
3. Oglesby. 1982.Highway Engineering.Singapore. 4. Utomo, S. H. T. 2009. Jalan Rel. Beta Offset. Edisi Kedua. Yogyakarta.
4. Surakim, Konstruksi Jalan Rel, Penerbit Nuansa Cendekia Bandung (2014)
5. PJKA 1986Perencanaan Konstruksi jalan Rel (Peraturan Dinas 10 A,B,C)
6. Imam Subarkah1981Jalan Kereta ApiBandung : IdeaDharma

Supporters:

1. Studi lapangan, di proyek pembangunan dan peningkatan jalan rel, baik di Balai perkeretaapian maupun di PT. KAI

Supporting lecturer	Dr. Ir. H. Dadang Supriyatno, M.T. Purwo Mahardi, S.T., M.Sc.

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 understand the definition of highways and railways as well as the scope of railways for the user community	Students can understand transportation, transportation systems and transportation systems engineering	**Criteria:** You get full marks if you do the questions and do everything correctly **Form of Assessment** : Test	Discuss to narrow down the meaning of Transportation Systems and basic concepts in 2 X 50 transportation		**Material:** History of the development of railways in Indonesia from colonial times to independence, Railway planning criteria, Components of railway construction **Reader:** *Dadang. 2004. Highway & Railway Teaching Book. Surabaya: FT. Unesa Civil.*	0%
2	Students understand the classification of trains in fulfilling people's lives	Students can understand the development of land transportation and the role of transportation in people's lives	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the classification of railway roads in supporting the design of 2 X 50 road infrastructure		**Material:** Superstructure components: rail, railfastening **Bibliography:** *Surakim, Railway Construction, Nuansa Scholar Bandung Publisher (2014)*	0%
3	Students understand the Geometric Characteristics of JKA Environmental Conditions Economic considerations and the surrounding community	Students understand the components in geometric design of railway roads	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss examples of influential components in geometric design of railway roads such as 2 X 50 tonnage passing speed		**Material:** Substructure Components: Bearings, Reply **Library:** *PJKA 1986 Railway Construction Planning (Service Regulations 10 A, B, C)*	0%
4	Students are able to understand the types of train traffic surveys. Planning train traffic surveys. Inventory surveys. Calculating train operational capacity	Students can understand and differentiate the definitions of each sub-material.	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the traffic survey process in supporting planning and evaluating the capacity of the 2 X 50 road		**Material:** Substructure construction components: Base and sub base **Reference:** *PJKA 1986 Railway Construction Planning (Service Regulations 10 A, B, C)*	0%
5	Students are able to prepare a geometric pre-plan for a railway road with the elements: Horizontal Alignment View Distance Vertical Alignment	Students can understand various variables in planning good road geometry for safe roads	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss methods for geometric calculations of 2 X 50 railway roads		**Material:** History of the development of railways in Indonesia **Reference:** *Dadang. 2004. Highway & Railway Teaching Book. Surabaya: FT. Unesa Civil.*	0%
6	Students are able to prepare a geometric pre-plan for a railway road with the elements: Horizontal Alignment View Distance Vertical Alignment	Students can understand various variables in planning good road geometry for safe roads	**Criteria:** You get full marks if you do the questions and do everything correctly **Form of Assessment** : Test	Discuss methods for geometric calculations of 2 X 50 railway roads		**Material:** History of the development of railways in Indonesia **Reference:** *Dadang. 2004. Highway & Railway Teaching Book. Surabaya: FT. Unesa Civil.*	0%

7	Students are able to understand the needs/road materials in: Stability analysis, soil bearing capacity analysis, material quality	Students are able to calculate the kung force of the soil	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the calculation method and discuss the results of the 2 X 50 calculation			0%
8	UTS	UTS	**Criteria:** UTS	UTS 2 X 50			0%
9	Students are able to understand Lower & Upper Construction Planning for Railway Roads: Methods for planning lower and upper Construction	Students are able to analyze road pavement layers according to the conditions of the surrounding environment	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the factors that influence the analysis of the construction of the 2 X 50 KA road			0%
10	Students understand and comprehend Railway Road Drainage and Complementary Buildings: Surface drainage Subsurface drainage Road drainage buildings Other complementary buildings	Students are able to tell about the development of road transportation infrastructure in various regions.	**Criteria:** You get full marks if you do the questions and do everything correctly	Students discuss the development of 2 X 50 rail road transportation			0%
11	Students understand & understand the development of Railway Transportation: Development of railroads in Indonesia	Students are able to understand the definition and role of free space for safe train travel	**Criteria:** You get full marks if you do the questions and do everything correctly	Students discuss the free space of the surrounding railway and its influence on the safety of 2 X 50 train travel			0%
12	Railway road elements: Conveying train loads. Rail Rail Connections Rail Fastening Ballast Bearings	Students are able to understand the stages of load delivery from upper construction to lower construction of the railway	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the distribution stages of the 2 X 50 train load distribution			0%
13	Students are able to recognize and understand the various types of railway bodies in straight lines and curves	Students are able to understand the shapes of railroad bodies	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss about the 2 X 50 Railway Body			0%
14	Students are able to recognize and understand curved steel roads: curved loads and widening of curved rails	Students are able to understand the planning stages of a railroad in curves	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the safety of train travel in curves related to the design speed of 2 X 50			0%
15	Students are able to recognize and understand Elements and Stations: Several train functions Several types of stations Several types of auxiliary buildings and facilities	Students are able to understand the function of emplacements and stations for train travel and train users	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the complementary buildings at the station and the buildings in the 2 X 50 emplacement			0%
16	Students are able to recognize and understand Elements and Stations: Several train functions Several types of stations Several types of auxiliary buildings and facilities	Students are able to understand the function of emplacements and stations for train travel and train users	**Criteria:** You get full marks if you do the questions and do everything correctly	Discuss the complementary buildings at the station and the buildings in the 2 X 50 emplacement			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.