	Universitas Negeri Surabaya Faculty of Engineering Civil Engineering Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Drawing Civil Buildings	2220103060	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	1	April 29, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model	**Project Based Learning**
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	Program Objectives (PO)
	PO - 1 Drawing simple building construction, water buildings and transportation buildings
	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	Introduction to the types, functions and ways of using drawing tools; Various lines, letters, numbers and symbols and their functions; Explain the various types of Pictorial, Orthogonal and Perspective projections and their applications in civil engineering; Building Construction Drawing (Case Study: 2 Storey Residential House), consisting of Architectural Drawings: Floor Plan, Foundation Plan, Roof Plan, Longitudinal Section, Cross Section, Front View, Side View. Structural Drawings: Plan for Laying Foundations, Sloofs and Columns for 1st Floor, Plan for Laying Beams and Columns for Floor 2, Plan for Placing Ring Beams and Ring Gevels, Table of Reinforcement and Transverse Portals and Longitudinal Portals. Introduction to Transportation Building Construction Drawings: Symbols and Legends, Layout Plans and Road Cross Section Drawings. Introduction to Water Building Construction Drawings: Irrigation Building Lay Out Plan Drawings, Details and Sections using AutoCAD software.
References	**Main :**

1. Affandi, Achmad Irfan. 19 26. Buku Ajar: Menggambar Teknik, Unesa Press
2. Cahyaka, Hendra Wahyu. 2004. Gambar Teknik. Unesa University Press.
3. S. C. Sharma. 1979. Engineering Drawing Part I. New York: Chand-Company Ltd. , Ram Nagar.
4. Reddy, K. Venkata, 2008. Text Book of Engineering Drawing. Second Edition. Text Books Online. url: https://www.pdfdrive.com/textbook-of-engineering-drawing-d28918244.html. Diunduh tanggal 29 April 2023.BS Publication. Hyderabad
5. Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Jurnal Dimensi Teknik Arsitektur Terakreditasi, Universitas Kristen Petra, Surabaya.
6. Handayani, Krisna Dwi; Triarso, Arik. 2018. Menggambar Bangunan Sipil. Unesa University Press. Surabaya.

Supporters:

1. Peningkatan Kompetensi Menggambar Menggunakan Autocad Tingkat Lanjut Guru-guru Di SMKN 1 Baureno Bojonegoro

Supporting lecturer	Krisna Dwi Handayani, S.T., M.MT., M.T. Abdiyah Amudi, S.T., M.T. Alwan Gangsar Brilian Putra, S.Tr.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	Identify the types and functions of standard drawing tools for lines, letters, numbers and symbols and their application to building engineering drawings	1. Students are able to identify various types of drawing tools 2. Students can explain the function of drawing tools and their application 3. Students are able to explain standard lines and their application to building engineering drawings 4. Students apply standard line drawings of letters and numbers	**Criteria:** Able to practice skills in applying Lines, Letters and Numbers in Writing Identity Tasks and Drawing Simple Building Plans by using drawing tools **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	Lecture, discussion, question and answer presentation. 2 x 50		**Material:** Introduction to the types and functions of drawing tools, standard lines for letters, numbers and symbols. **Bibliography:** *Affandi, Achmad Irfan. 19 26. Textbook: Technical Drawing, Unesa Press* **Material:** Standard Lines, Letters and Numbers **Library:** *26 26 26. , 20 26. Technical Drawing. 26 26. .* **Material:** (1) Basics of Using Autocad; (2) Coordinate System; (3) Image Field Settings; (3) Drawing Instructions; **Literature:** *Improving Drawing Competency Using Advanced Autocad for Teachers at SMKN 1 Baureno Bojonegoro*	4%
2	Various types of Orthogonal Projection, Pictorial Projection and Perspective Projection and examples of their application. Identifying the Basics of Engineering Drawing.	1. Understand the various types of Orthogonal Projection, Pictorial Projection and Perspective Projection and examples of their application 2. Applying various kinds of projections in doing Quadrant I and III projection drawing exercises 3. Identify dimensional components, symbols and information on building construction drawings 4. Draw dimensions, symbols and descriptions of simple building construction drawings	**Criteria:** Able to practice skills in applying various types of projections in carrying out Quadrant I and III projection drawing exercises and drawing dimensions, symbols and descriptions of simple building construction drawings.	- Group discussion - 2 x 50 case studies		**Material:** Orthogonal Projection, Pictorial Projection and Perspective Projection and examples of their application. **Reference:** *Affandi, Achmad Irfan. 19 26. Textbook: Technical Drawing, Unesa Press*	4%
3	Drawing Architectural Plans for the 1st and 2nd Floors of 2 Floor Residential Building Construction according to the steps and drawing standards in AutoCAD format.	1. Explain Orthogonal Projection of simple building shapes. 2. Identify standard Architectural Plan construction drawings for 2-story house buildings. 3. Drawing Orthogonal Projections of simple Architectural Plans.	**Criteria:** Able to practice the skills of drawing simple architectural plan orthogonal projections. **Form of Assessment** : Project Results Assessment / Product Assessment	- Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing Architectural Plans for 1st and 2nd Floors **Reference:** *Reddy, K. Venkata, 2008. Text Book of Engineering Drawing. Second Edition. Text Books Online. url: https://www.pdfdrive.com/.... Downloaded 29 April 2023.BS Publication. Hyderabad* **Material:** Drawing architectural plans for floors 1 and 2 in AutoCAD format. **Library:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	4%

4	Drawing foundation plans and architectural roof plans for 2-story residential building construction according to steps and standard drawings in AutoCAD format.	1. Explaining Orthogonal Projection Types of Foundations in simple buildings. 2. Identify standard architectural foundation plan construction drawings for 2-story house buildings. 3. Drawing Orthogonal Projections of Foundation Plans for simple buildings.	**Criteria:** Able to practice the skills of Drawing Orthogonal Projection Foundation Plans on simple buildings. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing building foundations **References:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing building foundations using AutoCAD format. **Reader:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	4%
5	Drawing Architectural Roof Plans for 2-Storey Residential Building Construction according to the steps and drawing standards in AutoCAD format.	1. Explaining the Orthogonal Projection of Roof Shapes on simple buildings. 2. Identify standard architectural Roof Plan construction drawings for 2-story house buildings. 3. Drawing Orthogonal Projections of Roof Plans on simple buildings.	**Criteria:** Able to practice the skills of Drawing Orthogonal Projection Roof Plans on simple buildings. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments. 2 x 50		**Material:** Drawing a Roof Plan **Library:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing a Roof Plan using AutoCAD. **References:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	3%
6	Drawing Longitudinal Sections, Architectural Cross Sections for 2 Storey Residential Building Construction according to the steps and drawing standards in AutoCAD format.		**Criteria:** 1. Explain the principle of Orthogonal Projection in Architectural Longitudinal Sections of simple buildings. 2. Identifying standard architectural longitudinal section construction drawings for 2-story house buildings. 3. Drawing orthogonal projections of architectural longitudinal section construction in simple buildings. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, 2 x 50 presentations		**Materials:** Drawing Pieces of Buildings **Library:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing building pieces using the AutoCAD application. **References:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	3%

7	Drawing Longitudinal Sections, Architectural Cross Sections for 2 Storey Residential Building Construction according to the steps and drawing standards in AutoCAD format.	1. Explain the principle of Orthogonal Projection in architectural Cross Sections of simple buildings. 2. Identify standard architectural cross sections in drawings of 2-story house buildings. 3. Drawing Orthogonal Projections of Architectural Cross Sections on simple buildings.	**Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing Pieces of Buildings **Library:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing Sections with the help of AutoCAD **Reader:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	4%
8	Midterm exam	1. Drawing Architectural Pieces of 2 Floor Building Construction 2. Construction Correctness 3. Correctness of Symbols and Image Captions 4. Accuracy of Image Dimensions and Elevation 5. Image Scale Accuracy	**Criteria:** Able to draw architectural pieces of construction with correct construction, symbols, descriptions, dimensions, elevations and with accuracy of drawing scale. **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Psychomotor Performance Test: Drawing Architectural Pieces of 2 X 50 2 Floor Building Construction			20%
9	Drawing structural plans for laying foundations, slopes and columns for the 1st floor of 2-story residential building construction according to the steps and standard drawings in AutoCAD format.	1. Identify the principles of statics and technical provisions for structural drawings of foundation, sloof and column laying plans 2. Identify the steps for drawing Structural Plans for Laying Foundations, Sloofs and Columns. 3. Identify standard structural drawings for plans for laying foundations, sloofs and columns. 4. Drawing a structural plan for laying foundations, slopes and columns for a simple residential house according to the steps and drawing standards.	**Criteria:** Able to practice knowledge of identifying static principles, technical provisions, drawing steps according to standard roof construction drawings and able to practice structural drawing of foundation, sloof and column laying plans in simple buildings. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing Plans for Laying Foundations, Sloofs and Columns **References:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing a plan for placing foundations, slopes and columns using AUtoCAD. **References:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	3%

10	Structural drawing of plans for laying beams and columns for the 2nd floor as well as plans for laying ring beams and ring gauges for the construction of a 2-story residential building according to the steps and drawing standards in AutoCAD format.	1. Draw a structural plan for laying beams and columns for the 2nd floor according to the steps and standard drawings in AutoCAD format 2. Draw a Ring Beam and Ring Gevel Laying Plan according to the steps and drawing standards in AutoCAD format	**Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing a Plan for Placing Columns and Beams **References:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing Column and Beam Layout Plans using AutoCAD. **References:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	4%
11	Draw a structural reinforcement table for a 2-story residential building according to the steps and drawing standards in AutoCAD format.	1. Able to draw reinforcement tables for 2-storey residential houses according to steps and standard Auto CAD format drawings 2. Able to Draw Sloof Reinforcement 3. Able to Draw Column Reinforcement 4. Able to draw beam reinforcement 5. Drawing Beam Ring Reinforcement 6. Able to Draw Gevel Ring Reinforcement	**Criteria:** Able to practice the skills of drawing reinforcement tables and drawing reinforcement for slopes, columns, beams, ring beams and ring gauges in accordance with standard drawings in AutoCAD format. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing Repetition Tables **Literature:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing Reinforcement Tables with the help of AutoCAD **Reader:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	4%
12	Drawing Longitudinal and Transverse Portals in AutoCAD format.	1. Identify the principles of drawing longitudinal and transverse portals in AutoCAD format. 2. Drawing a Longitudinal Portal in AutoCAD format. 3. Drawing a Transverse Portal in AutoCAD format.	**Criteria:** Able to practice knowledge of identifying the principles of drawing longitudinal and transverse portals and able to practice the skills of drawing longitudinal and transverse portals in AutoCAD format. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50			4%

13	Introduction to Transportation Building Construction Drawings: Symbols and Legends, Layout Plans and Road Cross Section Drawings.	1. Explaining the Principles of Transportation Building Construction Drawings: Symbols and Legends for Layout Plans and Road Cross Section Drawings. 2. Understanding the Principles of Transportation Building Construction Drawings: Symbols and Legends, Layout Plans and Road Cross Section Drawings. 3. Identify components of Transportation Building Construction Drawings: Symbols and Legends, Layout Plans and Road Cross Section Drawings. 4. Identify the steps for Transportation Building Construction Drawings: Symbols and Legends for Layout Plans and Road Cross Section Drawings. 5. Applying the steps for Transportation Building Construction Drawings: Symbols and Legends for Layout Plans and Road Cross Section Drawings.	**Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing a Road Layout with the help of AUtoCAD **Reader:** *SC Sharma. 1979. Engineering Drawing Part I. New York: Chand-Company Ltd. , Ram Nagar.* **Material:** Drawing a Road Layout with the help of AutoCAD **Reader:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	4%
14	Drawing Transportation Building Construction Layout Plans and Secondary Road Cross Sections in AutoCAD format	1. Drawing Transportation Building Construction Layout Plans in AutoCAD format. 2. Drawing Construction of Secondary Road Cross Section Transportation Buildings in AutoCAD format.	**Criteria:** Able to practice Drawing Construction Building Transportation Layout Plan and Secondary Road Cross Section skills in AutoCAD format. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing a Cross Section of a Road **Library:** *Handayani, Krisna Dwi; Triarso, Arik. 2018. Drawing Civil Buildings. Unesa University Press. Surabaya.* **Material:** Drawing a road cross section using AutoCAD. **Reader:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	4%

15	Drawing Channel and Sluice Gate Building Construction Layout Plans in AutoCAD format	1. Identify the principles and components of Channel and Sluice Gate Construction Layout Plan. 2. Drawing Construction of Canal Buildings and Sluice Gate Layout Plans.	**Criteria:** Able to practice Knowledge of Construction of Canal Buildings and Sluice Gate Layout Plans, as well as being able to practice Drawing Construction of Canal Buildings and Sluice Gate Layout Plans. **Form of Assessment** : Project Results Assessment / Product Assessment	Lectures, discussions, questions and answers, and assignments, presentations. 2 x 50		**Material:** Drawing AIr Channel Layout **Reader:** *SC Sharma. 1979. Engineering Drawing Part I. New York: Chand-Company Ltd. , Ram Nagar.* **Material:** Drawing AIr Channel Layout with the help of AutoCAD **Reader:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.*	5%
16	Drawing of detailed construction of channel and sluice gates in AutoCAD format	1. Identify the principles of Construction of Channel and Sluice Buildings. Detailed Sections in AutoCAD format. 2. Drawing of detailed construction of channel and sluice gates in AutoCAD format.	**Form of Assessment** : Project Results Assessment / Product Assessment	2 x 50		**Material:** Drawing details and cuts of AIr channels with the help of AutoCAD **Reader:** *Khrisbianto, Andi. 2009. AutoCAD 2010 To The Point. Jakarta: Elex Media Komputindo. 6. Accredited Journal of Architectural Engineering Dimensions, Petra Christian University, Surabaya.* **Material:** Drawing Details and Sections of Water Channels **Reference:** *SC Sharma. 1979. Engineering Drawing Part I. New York: Chand-Company Ltd. , Ram Nagar.*	30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	1.33%
2.	Project Results Assessment / Product Assessment	87.33%
3.	Portfolio Assessment	1.33%
4.	Test	10%
		99.99%

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.