



**Universitas Negeri Surabaya  
Faculty of Engineering  
Civil Engineering Undergraduate Study Program**

Document Code

**SEMESTER LEARNING PLAN**

<b>Courses</b>	<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>	<b>SEMESTER</b>	<b>Compilation Date</b>																																											
Wooden Structure *	2220102118		T=2 P=0 ECTS=3.18	8	July 18, 2024																																											
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>		<b>Study Program Coordinator</b>																																											
	.....		.....		Yogie Risdianto, S.T., M.T.																																											
<b>Learning model</b>	Project Based Learning																																															
<b>Program Learning Outcomes (PLO)</b>	PLO study program that is charged to the course																																															
	Program Objectives (PO)																																															
	PLO-PO Matrix																																															
		<table border="1" style="margin: auto;"> <tr><td style="width: 50px; height: 20px;">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: auto;"> <tr> <td rowspan="2" style="width: 30px; height: 20px;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px;">1</td><td style="width: 20px;">2</td><td style="width: 20px;">3</td><td style="width: 20px;">4</td><td style="width: 20px;">5</td><td style="width: 20px;">6</td><td style="width: 20px;">7</td><td style="width: 20px;">8</td><td style="width: 20px;">9</td><td style="width: 20px;">10</td><td style="width: 20px;">11</td><td style="width: 20px;">12</td><td style="width: 20px;">13</td><td style="width: 20px;">14</td><td style="width: 20px;">15</td><td style="width: 20px;">16</td> </tr> </table>															P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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<b>Short Course Description</b>	This course examines the science of wood materials, getting to know the properties of wood, including the structure of wood as an organic material, physical properties of wood, hygroscopic properties of wood, and mechanical properties of wood (direction of fibers and direction of force, elastic modulus, tensile stress, compressive stress, bending stress, shear, moisture content, condition, method and duration of loading). Types and classification of wood (durability, strength and use) commonly used as structural and non-structural materials as well as industry standards for curing and drying, allowable stress. Wood joining tools and wood connections (bolt nails, pegs, adhesives, modern connecting tools and tooth connections), laying construction, beam and pole connections. Structural elements in planning include tension members, compression members (columns with compressive/bending loads), flexible beams, beams supporting moments and normal forces. The appropriate learning model for this course is the direct and cooperative learning method.																																															
<b>References</b>	<b>Main :</b>																																															
	<ol style="list-style-type: none"> <li>1. Wiryomartono, Suwarno. 1968. Konstruksi Kayu . Yogyakarta: UGM.</li> <li>2. Yap, Felix, K.H. 1984. Konstruksi Kayu . Bandung: Bina Cipta.</li> <li>3. Frick Heinz. 1986. Ilmu Konstruksi Bangunan Kayu . Yogyakarta: Kanisius.</li> <li>4. Sadjii. 1999. Konstruksi Kayu . Surabaya: ITS Press.</li> <li>5. Anonim. 1961. Peraturan Konstruksi Kayu Indonesia . Jakarta: DPU.</li> <li>6. Anonim. 2002. Tata Cara Perencanaan Konstruksi Kayu Indonesia (PKKI NI-5) . Jakarta: DPU</li> <li>7. Awaluddin, Ali. 2005. Konstruksi Kayu . Yogyakarta: UGM.</li> <li>8. Kusnan. 2011. Konstruksi Kayu . Surabaya: Unipres Unesa.</li> </ol>																																															
	<b>Supporters:</b>																																															
<b>Supporting lecturer</b>	KUSNAN Drs. Hasan Dani, M.T. Heri Suryaman, S.Pd., M.Pd.																																															
<b>Week-</b>	<b>Final abilities of each learning stage (Sub-PO)</b>	<b>Evaluation</b>		<b>Help Learning, Learning methods, Student Assignments, [ Estimated time]</b>		<b>Learning materials [ References ]</b>	<b>Assessment Weight (%)</b>																																									
		<b>Indicator</b>	<b>Criteria &amp; Form</b>	<b>Offline ( offline )</b>	<b>Online ( online )</b>																																											
<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>																																									
1	Students understand and recognize the structure of wood and the background of wood being used for building construction	Briefly explain the parts of wood and their functions	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	Presentation/lecture Discussion and reflection 2 X 50			0%																																									

2	Students understand and recognize the structure of wood and the background of wood being used for building construction.	Briefly explain the parts of wood and their functions.	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection 2 X 50			0%
3	Students understand the properties of wood, the physical, chemical, biological and mechanical properties as well as the allowable stress in wood.	1.Explain the physical properties of wood. 2.Explain the chemical and biological properties of wood. 3.Explain the mechanical properties of wood. 4.Explain the allowable stress in wood of its type and class.	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection 2 X 50			0%
4	Students classify the strength class and durability class of wood to determine the allowable stress of wood for certain construction conditions.	1.Determine the wood strength class and wood durability class based on the name of the race, specific gravity modulus of elasticity. 2.Calculate the allowable stress of wood for construction conditions and working loads.	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection - 2 X 50 case studies			0%
5	Students are able to design wooden construction for tension members, compression members and flexible girders.	- Determine and control the dimensions of wood for tension and compression members based on the allowable tensile/compressive stress of the wood. - Determine and control wood dimensions for bending rods based on the allowable bending stress of the wood.	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	Presentation/lectureDiscussion and reflectionCase study 2 X 50			0%
6	Students are able to design wooden construction for flexible rods using tension or compression and are able to design wooden construction for double rods.	1.Determine the dimensions of the rod for rods that bend under compression or tension. 2.Determine the cross-sectional dimensions of the double bar.	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection - 4 X 50 case studies			0%
7							0%
8	UTS	UTS	<b>Criteria:</b> UTS	UTS 2 X 50			0%
9	Students are able to design and calculate bolted connections based on maximum tensile or compressive forces.	1.Calculate the nominal force capacity of each bolt. 2.Determine the number of bolts. 3.Determine the distance between bolts.	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection - 4 X 50 case studies			0%
10							0%

11	Students are able to calculate the tooth and heel joints in wooden construction and how to install them.	<ol style="list-style-type: none"> <li>1. Calculate the nominal force and stress of installing a single tooth connection.</li> <li>2. Calculate nominal forces and stresses from installing frame and/or heel gear connections.</li> <li>3. Determine the installation of single and double tooth connections in wood construction connections.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection - 2 X 50 case studies			0%
12	Students are able to calculate nail connections in wooden construction and how to install them.	<ol style="list-style-type: none"> <li>1. Determine the size of the nail.</li> <li>2. Calculate the nominal force of each nail connection installation.</li> <li>3. Determine the installation distance from the nail joint.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection - 2 X 50 case studies			0%
13	Students are able to calculate the joints of building blocks with nails and dowel connections for wooden construction.	<ol style="list-style-type: none"> <li>1. Determine the nominal force of each nail.</li> <li>2. Determine the installation of nails on building blocks.</li> <li>3. Controlling the capacity of stacking beam connections with nails.</li> <li>4. Determine the size of the wood for the dowel connection.</li> <li>5. Calculate nominal forces in wood joints.</li> <li>6. Determine the installation of pegs.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Presentation/lecture - Discussion and reflection - 2 X 50 case studies			0%
14	Students are able to understand and calculate connections in simple girders.	<ol style="list-style-type: none"> <li>1. Determine the connection and calculate the nominal force of the connection.</li> <li>2. Determine and calculate the dimensions of wooden connecting plates.</li> <li>3. Calculating controls for girder connections.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	Group discussion Case study 2 X 50			0%
15	Students are able to complete and present group assignments related to planning in wooden construction.	<ol style="list-style-type: none"> <li>1. Determine the type of construction being discussed.</li> <li>2. Calculating load planning.</li> <li>3. Calculate internal forces and moments.</li> <li>4. Determine the type of connection used.</li> <li>5. Plan and draw how to install connections.</li> </ol>	<b>Criteria:</b> Full marks are obtained if you do all the questions correctly and precisely	- Group discussion of case studies. - Class presentations by students. 2 X 50			0%
16	UAS	UAS	<b>Criteria:</b> UAS	UAS 2 X 50			0%

### Evaluation Percentage Recap: Project Based Learning

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.