	SAM RATULANGI UNIVERSITY **FACULTY OF ENGINEERING** **ARCHITECTURE DEPARTMENT** **ARCHITECTURE UNDERGRADUATE STUDY PROGRAM**

SEMESTER STUDY PLAN

Subject	**Code**	**Genre of Subject**	**SKS**	**Semester**	**Date**
Intelligent Building			2 SKS		1st February 2021

Authorization:	**SSP Developer**	**Coordinator of Research Group**	**Coordinator of Study Program**
	Prof. Dr. Ir. Ar. Jefrey I. Kindangen, DEA., GP., IAI.		Ar.Frits O.P. Siregar, ST., MSc.IAI.

Expected Learning Outcomes	ELO-SP	
	Appropriate in the curriculum book	
	ELO-Subject	
	1. Students are able to know & apply the principles of intelligent building systems, telecommunication systems, automation, databases and workplaces. 2. Students are able to apply the intelligent building system to achieve comfort, security and safety of the building, in lighting design and acoustic design	
Description of subject MK	This course contains the history and concepts of smart buildings, principles and functionalization of smart buildings. Building automation for temperature control, humidity and air pressure in the room, control of application and acoustics of rooms and environments. Telecommunication systems in buildings and out of buildings, such as real-time operationalization/control systems to achieve energy efficiency in buildings, building safety systems.	
Learning Materials/Subject Matter	1. Building comfort system or building automation for temperature control, humidity and air pressure in the room. 2. Applications and controls acoustics of the room and environment 3. Telecommunication systems in buildings and exits 4. Real-time operationalization/control systems to achieve energy efficiency in buildings 5. Building security system 6. Building safety systems	
References	1. Clemets-Croome, D. (ed), 2013. Intelligent Buildings. Design, Management, and Operation, Second Edition, ICE	

	Publishing, London 2. Sinopoli, J. 2010. Smart Building System for Architect, Owners, and Builders, Elsevier, USA 3. Wang, S. 2010. Intelligent Buildings and Building Automation, Spon Press, London 4. Kindangen, J.I. and Putro D.M. 2021. Bangunan Pintar: Dasar Aplikasi Otomasi Bangunan dan Kecerdasan Buatan, Deepublish, Yogyakarta
Learning Media	Software Hardware: Laptop, PC, WiFI, internet network
Team Teaching	-
Required courses	None

Week/The th meeting-	Expected End Ability	Study Materials	Learning Strategies / Methods	Time Allocation	Criteria (Indicators) of Achievement	Assessment Instruments	Percentage	Bibliography/ Literature
1	2	3	4	5	6	7	8	9
1	Students know the subject matter to be studied, the grading system and how to learn this subject	Introduction to lectures: Determination of subject matter / sub-subject matter, lecture contract	Lectures and discussions	3 x 50 minutes	Accuracy of knowing all subjects, grading systems and how to learn	AQ	-	-
2, 3	Students are able to know the history and basic concepts of smart buildings	History of Smart Buildings Basic concepts Smart buildings and their functionalization	Lectures and discussions	6 x 50 minutes	Accuracy explains the history and what smart buildings are , how is the functionalization of smart buildings	Discussion Group tasks	10%	1, 2, 4
4, 5	Students are able to understand the concept of building automation, advantages, and the development	The concept of building automation. Advantages of implementing building automation.	Lectures and discussions Assignment	6 x 50 minutes	Accuracy in formulating the concept of building automation, choosing a building automation system and knowing its	AQ Discussion Assignment	15%	1, 2, 4

	of building automation systems. Students are able to know the types of sensors, transducers, actuators, and microcontrollers Implementing sensor, transducer, actuator, and microcontroller applications.	The development of building automation systems. Types of sensors, transducers, actuators and microcontrollers.			advantages. Understand and apply appropriately sensors, transducers, actuators and microcontrollers.			
6	Students are able to know and are able to choose telecommunication systems in buildings, security systems and building safety.	Telecommunication systems in buildings, building security and safety systems	Lectures and discussions	3 x 50 minutes	Accuracy in choosing a safety and security telecommunications system in buildings	AQ Discussion	10%	1,2,3,4
7	Students are able to present tasks on building automation in groups.	Group assignments, workshops and presentations of simple building automation projects	Workshop Presentation	3 x 50 minutes	Ability to work together in completing a project together. The ability to present projects that have been created.	Presentation	15%	1, 2, 4
8		Midterm Exams		1,5 hours	-	-	-	-
9, 10	Students are able to conceptualize	Application of smart building	Lectures and discussions	6 x 50 minutes	Ability to understand and	AQ Assignment	10%	1, 2, 4

	and apply smart building systems for thermal comfort	systems for thermal comfort	Assignment		apply important factors of thermal comfort and formulate Smart building techniques and systems for thermal comfort			
11, 12	Students are able to conceptualize and apply smart building systems for lighting design: natural and artificial lighting	Application of smart building systems for lighting design	Lectures and discussions Assignment	6 x 50 minutes	Ability to understand and apply important factors of lighting design and formulate Smart building techniques and systems for natural and artificial lighting design.	AQ Assignment	15%	1, 2, 4
13, 14	Students are able to conceptualize and apply smart building systems for acoustic design: Interior and exterior matters	Applications of smart building systems for acoustic design	Lectures and discussions Assignment	6 x 50 minutes	Ability to understand and apply important factors of indoor and exterior acoustic design and formulate Smart building techniques and systems for air borne sound and structure borne sound.	AQ Assignment	15%	1, 2, 3, 4
15	Students are able to work together and present group	Group assignments, workshops and presentations of	Workshop and presentation	3 x 50 minutes	Ability to work together in completing a	Group tasks Presentation	10%	1, 2, 4

	assignments for simple projects that address thermal, lighting and acoustic comfort	simple building automation projects			project together. The ability to present projects that have been created: thermal comfort, lighting design and acoustic design			
16		End of Semester Exams	Problem solving	1,5 hours	-	-	-	-

Manado, 1st February 2021

Prof. Dr. Ir. Ar. Jefrey I. Kindangen, DEA., GP., IAI.