CURRICULUM BOOK
K·2020

ARCHITECTURE
UNDERGRADUATE STUDY PROGRAM

Faculty of Engineering
Sam Ratulangi University

CURRICULUM K-2020
ARCHITECTURE UNDERGRADUATE PROGRAM
FACULTY OF ENGENEERING
SAM RATULANGI UNIVERSITY

I.   INTRODUCTION

The Department of Architecture is one of four departments within the Faculty of Engineering, Sam Ratulangi University. The Department of Architecture manages two study programs, namely the Undergraduate Architecture Program (PS-ARS) and the Urban & Regional Planning Undergraduate Program (PS-PWK). Formally, the Department of Architecture has been institutionally present in the Faculty of Engineering, Sam Ratulangi University (FATEK-UNSRAT) since 1998, based on the Decree of the Director General of Higher Education No.212 / DIKTI / Kep / 1998, dated 3 July 1998 and Decree of the Director General of Higher Education No. 457 / DIKTI / Kep / 1988 dated 18 December 1998. existing Civil Engineering

PS-ARS have four Expertise Lecturer Groups (KDK), each of which is: 1) Design, Modeling and Architectural Computing, 2) History, Theory, and Architectural Criticism, 3) Building Science & Technology, and 4) Landscape Architecture. Each KDK is functionally coordinated by 2 (two) lecturers respectively as Coordinator and Secretary. In the UNSRAT FATEK governance organization, KDK is under the authority of the Architecture Laboratory which is positioned as a working partner for the PS-ARS in carrying out educational activities, research activities and community service activities.

The existence of KDK is basically the main driving force in efforts to update the curriculum, especially the substance of the Semester Learning Plan (RPS) for each existing course, so that it remains updated and in accordance with the latest developments in the field of science and technology, according to the scientific background of each KDK. In this study program each KDK, through the lecturers who join it, is responsible for compiling, developing and regularly updating the of a number of courses in the curriculum structure. However, there are several courses where the preparation of the RPS involves the collaboration of lecturers across KDK, especially core courses in the curriculum structure which are comprehensive from a scientific point of view.

In broad outline, the preparation of the curriculum in the PS-ARS is carried out with a series of stages and considerations as described below in Figure 1 and 2.

Curriculum K-2020 was compiled in 2019, with the background of adapting efforts to scientific developments, especially in facing the current 4.0 Industrial Revolution. This adaptation was carried out simultaneously in all study programs on UNSRAT. This curriculum was also the result of a revision from K-2015, because PS-ARS constantly revises its curriculum every five years. Various regulations as a guideline for K-2015 were still used because they were still relevant to current conditions, like SN-DIKTI 2014, K-DIKTI 2014, IAI Competency Standards, and APTARI Competency Standards. K-2020 also responds to the vision and mission of PS-ARS, which are hierarchically linked with the vision and mission of UNSRAT and FATEK, which are contained in the 2019-2023 Department of Architecture Strategic Plan book. The following is an illustration of the curriculum preparation process, specifically for K-2020
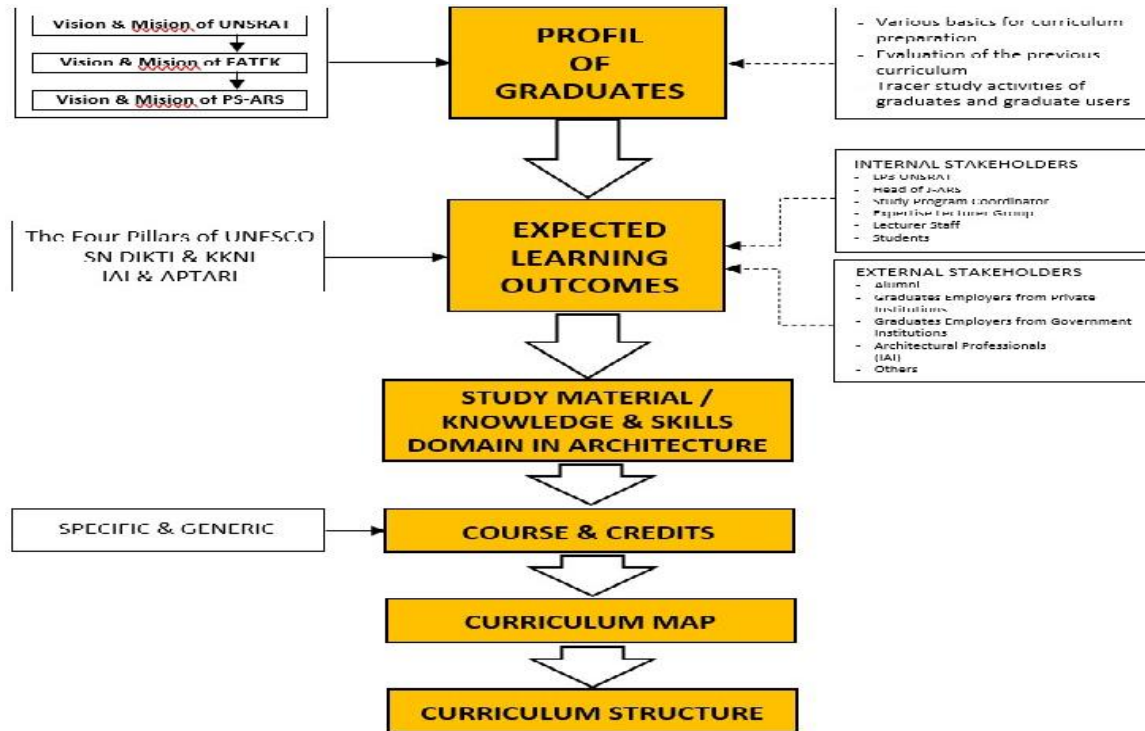
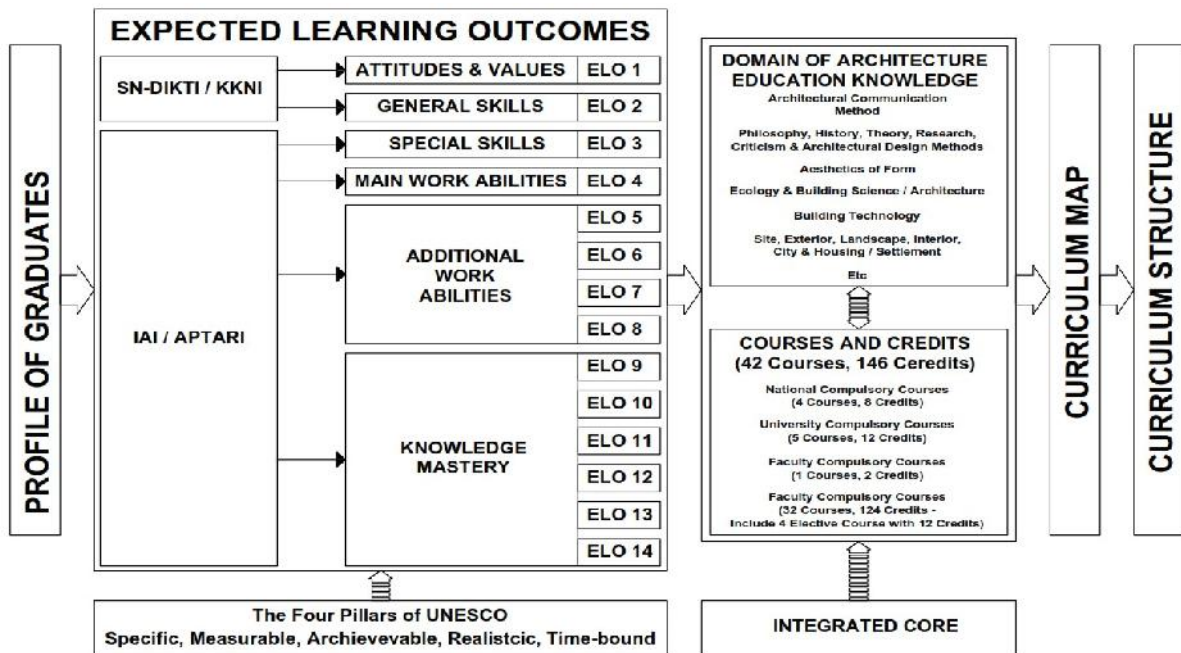Figure 1.   General Steps on The Curriculum Design Process on PS-ARS

Figure 2. The Curriculum Design Process on PS-ARS K-2020

II.   VISION, MISION AND GOAL

UNSRAT has a vision that is "Toward an Excellent and Cultured University" by striving to prepare people with competitive and comparative abilities, who are able to compete and contribute positively in an increasingly competitive world (hyper competitive).

The FATEK is currently one of the faculties in UNSRAT, by referring to the vision of UNSRAT, and involving input from all internal and external stakeholders, has set a vision for 2018-2022, namely "Towards an International Class Faculty of Engineering with Local Character".

PS-ARS as part of the Department of Architecture, with reference to the formulation of the vision of FATEK and the vision of UNSRAT has set its own vision for the period 2019-2023, namely:

"To Become an Architecture Study Program that Received International Recognition in the ASEAN Region Based on the Vernacular Architecture of the Coastal and Hilly Areas".

In the formulation of this vision, the phrase "… Received International Recognition in the ASEAN Region …" is a direct translation of the phrase "… International Class Engineering Faculty…" in FATEK's vision and the phrase "… Excellent University …" in UNSRAT's vision. In the future, as an institution providing higher education services, PS-ARS is expected to become a highly competitive institution in the ASEAN region, especially in addressing the existence of similar higher education services in the field of architecture. In the vision formulation above, the phrase "... Based on Vernacular Architecture of Coastal and Hilly Areas …" is a direct translation of the phrase "... with Local Character ..." in FATEK's vision and the phrase "… Cultured University …" in UNSRAT's vision. In this translation, there is an implied understanding that PS-ARS has an aspiration to become a higher education service institution capable of producing excellent graduates in the field of architecture with special uniqueness in accordance with local wisdom in areas characterized by coastal and hilly areas. The development of education, research and community service activities will be based on sustainable architectural design efforts compatible with that characters. This is expected to make PS-ARS have competitiveness starting at the regional, national and even international levels, especially in the ASEAN region. The formulation of the PS-ARS vision is structured realistically by taking into account the context of human resources, especially the support of educators (lecturers) with various competent backgrounds.

To achieve the vision, PS-ARS set its mission as follows:

1. Improving Tridharma of Higher Education in Indonesia services which are of international standard and characterized by the Vernacular Architecture of the Coastal and Hilly Areas.
2. Carrying out the architectural education process by utilizing the development of Science and Technology in the Industrial Revolution Era 4.0 to produce graduates who are competent and competitive in the ASEAN Region.
3. Utilizing internal resources and expanding national and international cooperation networks to improve the welfare of internal and external stakeholders.
4. Developing the capacity of internal resources to improve governance that is credible, transparent, accountable, responsible and fair for a higher quality and sustainable institutional image.

The goal of the PS-ARS are:

1. The implementation of the Tridharma PT which has international standards and has the character of Vernacular Architecture for Coastal and Hilly Areas.
2. Producing graduates who can compete in the Industrial Revolution Era 4.0, are professional, innovative and cultured in taking advantage of technological developments in the Pacific Region.

3. The development of a cooperative network that is interactive services with stakeholders at home and abroad to improve welfare.
4. The realization of effective, efficient and accountable governance for a higher quality and sustainable institutional image.

III. GRADUATE PROFILE

Based on the formulation of its vision and mission, PS-ARS has established a profile of its graduates which is:

"The Bachelor of Architecture who has the ability to work independently or in group, based on competence, knowledge and skills in various fields of construction industry related to architectural services that have received international recognition in the ASEAN Region, based on Vernacular Architecture of Coastal and Hilly Areas".

The formulation of the graduate profile of this study program is also elaborated by taking into account a number of aspects including inputs from various internal and external stakeholders as well as the latest issues and concerns in the field of architecture and other relevant disciplines. Concretely, the formulation of the graduate profile of this study program is aimed at 4 (four) categories of possible professional roles that graduates can fill in, which are construction industry entrepreneurs (architects, consultants, contractors or developers), construction industry workers, academics and bureaucrats.

The formulation of the graduate profile of this study program is also elaborated by taking into account a number of aspects such as various basics for curriculum preparation, evaluation of the previous curriculum and input from various internal and external stakeholders, including input from the tracer study activities of graduates and graduate users. Concretely, the formulation of the graduate profile of this study program is aimed at 4 (four) categories of possible professional roles that graduates can fill in, each with the formulation of its basic competencies as shown in the following table.

Table 1. Category, Description & Code of Graduate Job Profile of PS-ARS in K-2020

Num	Graduate Profile	Description	Code
1	ENTREPRENEURSHIP IN THE CONSTRUCTION INDUSTRY	Having the ability to do business independently based on his competence, knowledge and skills in various fields of construction industry related to architectural services that have received international recognition in the ASEAN Region based on the Vernacular Architecture of the Coastal and Hills Areas..	P1
	a. Professional Architect	Having the ability to carry out design activities of an architectural object in the form of a building and / or its exterior and interior environment, based on the context of certain design problems, related to object typology, location / site, and certain themes, and produce designs that meet the basic criteria of architectural quality (functional , sturdy, aesthetic), and well presented through communicative design documents.	
	b. Professional Consultant	Having the ability to carry out the management of planning / design activities as well as monitoring activities for the physical construction process of the built environment, especially those related to architectural services	
	c. Professional Contractor	Having the ability to manage the physical construction process of buildings and / or their exterior and interior environments in accordance with certain design documents, in relation to the efficiency of available resources including costs, labor, materials, tools & time, with due regard to the legal aspects of implementing physical construction / construction the building and its environment.	

	d. Developer	Having the ability to initiate and implement the physical development process of a certain functional area, both components of the building and / or its exterior and interior environment.	
2	CONSTRUCTION INDUSTRY WORKERS (Designer, Constructor and Supervisor)	Having the ability to carry out authority and responsibilities as part of the work team of a business entity in the construction industry, either a Consultant (Planner / Supervisor), Contractor or Developer, in accordance with the role assigned by the management of the business entity (surveyor, drafter, animator, planner / designer, cost estimator, field supervisor, site manager).	P2
3	ACADEMICS	Having the ability to carry out educational and teaching activities, research and community service in the field of architecture.	P3
4	BUREAUCRAT	Having the ability to develop and implement policies / institutions for the construction of buildings and their environment, based on architectural principles as well as relevant development / government administration principles.	P4

The formulation of the graduate profile will then become the basis for determining the expected learning outcomes (ELO) in the PS-ARS which will eventually become a reference in curriculum development.

IV. EXPECTED LEARNING OUTCOMES

ELOs formulation is carried out by referring also to a number of references, particularly the National Higher Education Standards (SN-DIKTI), the Indonesian National Qualifications Framework (KKNI) and the competency standards from associations related to the study program, especially the Indonesian Architects Association (IAI) and & the Indonesian Association of Architecture Education (APTARI). ELOs formulation can be seen in table 2.

The ELOs categorization includes attitudes, skills and knowledge. Refering to this categorization, the ELOs formulation of this study program is categorically divided into: 1) Attitude, 2) General Skills, 3) Special Skills / Job Abilities and 4) Knowledge Mastery. The ELOs formulation in the first and second categories basically refers directly to the SN-DIKTI and KKNI directions (Level 6 for undergraduate education programs), where the "Attitude" category includes 10 (ten) points of learning outcomes and the "General Skills" category includes 9 (nine) points of learning outcomes. These points also include the 8 basic competencies of lifelong learning.

The ELOs formulation for the category "Special Skills / Work Abilities" is defined with specific reference to the competency standards set by IAI and APTARI and is also corresponded with the category of the graduate profile. This category is still differentiated into 3 (three) sub categories, namely: a) Special Skills, b) Main Work Abilities and c) Additional Work Abilities. In full, the learning outcomes in this category include 16 (sixteen) items. Furthermore, for the category "Knowledge Mastery", the points of learning outcomes are formulated in relation to fields of study within the scope of architectural science which include: a) philosophy, history, theory, research, criticism and architectural design methods, b) aesthetics of form, art and culture, c) ecology and building science, d) site planning, exterior space & interior space, landscape, urbanism, housing and settlement and e) other knowledge. In this category, learning outcomes are broken down into 40 (forty) items.

However, referring to the above categorization basis, the ELOs formulation of this study program can be simplified to 14 (fourteen) points and briefly stated in Table 3, each in relation to the predefined graduate profile formulations.

Table 2. PS-ARS Eleborated ELOs Formulation (K-2020)

ELABORATED ELOs FORMULATION		Grad. Profile Code				EQUIVALENT COMPRESSED ELOs
		P1	P2	P3	P4	
ATTITUDES & VALUES *(in Accordance to SN-DIKTI/KKNI Level)*						**ELO 01 – A1**
S1	Believe in God Almighty and be able to show a religious attitude;	P1	P2	P3	P4	Embodying a behavior setting that includes national patriotism; religious; humanistic; appreciative and tolerant to cultural and religious diversity; sensitive to social and natural environmental issues; obedience to the law; uphold academic ethics; responsible, independent, perservering, thriving and have entrepreneurial spirit.
S2	Upholding human values in carrying out duties based on religion, morals and ethics;	P1	P2	P3	P4	
S3	Contributing to improving the quality of life in society, nation, state and civilization based on Pancasila;	P1	P2	P3	P4	
S4	Acting as citizens who are proud and love the country, have nationalism and a sense of responsibility to the state and nation;	P1	P2	P3	P4	
S5	Respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others;	P1	P2	P3	P4	
S6	Cooperate and have social sensitivity and concern for the community and the environment;	P1	P2	P3	P4	
S7	Obeying the law and discipline in social and state life;	P1	P2	P3	P4	
S8	Internalizing academic values, norms, and ethics;	P1	P2	P3	P4	
S9	Demonstrate an attitude of responsibility for work in their field of expertise independently;	P1	P2	P3	P4	
S10	Internalizing the spirit of independence, struggle and entrepreneurship	P1	P2	P3	P4	
GENERAL SKILLS *(in Accordance to SN-DIKTI/KKNI Level)*						**ELO 02 – S1**
KU1	Able to apply logical, critical, systematic, and innovative thinking in the context of developing or implementing science and technology that pays attention to and applies humanities values in accordance with their field of expertise;	P1	P2	P3	P4	Able to make decisions, apply or develop science, technology and art with logical, critical, systematic, innovative, creative, qualified and measurable thinking, independently or in group cooperation, based on valid data input and analysis, and well reported and documented.
KU2	Able to demonstrate independent, quality and measurable performance;	P1	P2	P3	P4	
KU3	Able to study the implications of the development or implementation of science and technology that pays attention to and applies humanities values according to their expertise based on scientific principles, procedures and ethics in order to produce solutions, ideas, designs or art criticisms;	P1	P2	P3	P4	
KU4	Able to compile a scientific description of the results of the study mentioned above in the form of a thesis or final project report, and upload it on the college page;	P1	P2	P3	P4	
KU5	Able to make decisions appropriately in the context of problem solving in their area of expertise, based on the results of information and data analysis;	P1	P2	P3	P4	
KU6	Able to maintain and develop networks with mentors, colleagues, peers both inside and outside the institution.	P1	P2	P3	P4	
KU7	Able to be responsible for the achievement of group work and to supervise and evaluate the completion of work assigned to workers who are under their responsibility;	P1	P2	P3	P4	
KU8	Able to carry out the self-evaluation process of the work group under their responsibility, and able to manage learning independently;	P1	P2	P3	P4	
KU9	Able to document, store, secure, and recover data to ensure validity and prevent plagiarism;	P1	P2	P3	P4	
SPECIAL SKILLS *(in Accordance with the Interpretation of IAI & APTARI Competency Standards)*						**ELO 03 – S2**

ELABORATED ELOs FORMULATION		Grad. Profile Code				EQUIVALENT COMPRESSED ELOs
		P1	P2	P3	P4	
KK1	Able to communicate architectural thinking through mathematical and statistical expressions manually and with the aid of computers;	P1	P2	P3		Able to perform various architectural communication techniques (mathematical & statistical expression; manual & computer aided drawings; oral & written verbal narratives) to support a design proposition.
KK2	Able to communicate architectural thinking through the medium of drawings and three-dimensional models created manually;	P1	P2	P3		
KK3	Able to communicate architectural thinking through the medium of images and three-dimensional models created with the help of computers;	P1	P2	P3		
KK4	Able to communicate architectural thinking through the medium of scientific writing and oral presentations in a formal forum;	P1	P2	P3	P4	
KK5	Able to use a variety of architectural communication techniques in a design proposition.	P1	P2	P3		
MAIN WORK ABILITIES - *as Architec / Designer* (in Accordance with the Interpretation of IAI & APTARI Competency Standards)						**ELO 04 – S3**
KK6	Able to apply architectural knowledge and skills in carrying out design activities of an architectural object in the form of a building and / or its exterior and interior environment, based on the context of certain design problems, related to object typology, location / site of coastal and hilly areas, as well as certain themes, and produce designs that meet the basic criteria of architectural quality (functional, sturdy, aesthetic), and are well presented through communicative design documents;	P1	P2			Able to apply architectural knowledge and skills to design an architectural object based on a contextual design problems, especially on the coastal and hilly environment, and present the design result through communicative design documents
KK7	*Able to identify design problems in a contextual manner;*	P1	P2			
KK8	*Able to develop frameworks, processes, strategies and design methods in accordance with the context of the design problem;*	P1	P2			
KK9	*Able to collect data and information related to the context of the design problem;*	P1	P2			
KK10	*Able to conduct design studies/analysis based on data and information related to design problems, especially study/analysis of the typological context of the design object, location/tread of coastal and hilly areas, as well as design thematics;*	P1	P2			
KK11	*Able to synthesize conceptual design ideas including programmatic concepts, site development concepts, building design concepts and outdoor space, according to the input of the study / design analysis and the context of the design problem;*		P2			
KK12	*Able to concretize design results in the form of image documents, mock-up models or animations, as well as design reports, in accordance with the results of optimization of the design concept which is a solution to contextual design problems.*		P2			
ADDITIONAL WORK ABILITIES - *as Executor / Supervisor of the Construction Process* (in Accordance with the Interpretation of IAI & APTARI Competency Standards)						**ELO 05 – S4**
KK13	Able to apply architectural knowledge and skills in carrying out the activities of managing the physical construction process of buildings and/or their exterior and interior environments in accordance with certain design documents, in relation to the efficiency of available resources including costs, labor, materials, tools & time, taking into account legal aspects of the implementation of the construction / physical construction of the building and the applicable environment.		P2			Able to apply architectural knowledge and skills to carry out the physical construction process of an architectural object in relation to the efficiency of available resources and the applied legal aspects.
ADDITIONAL WORK ABILITIES - *as a Construction Industry Entrepreneur* (in Accordance with the Interpretation of IAI & APTARI Competency Standards)						**ELO 06 – S5**

ELABORATED ELOs FORMULATION		Grad. Profile Code				EQUIVALENT COMPRESSED ELOs
		P1	P2	P3	P4	
KK14	Able to apply architectural knowledge and skills in initiating and developing a business independently in the construction industry (Professional Architects, Implementing Contractors, Planning / Supervisory Consultants, Developers, etc.)	P1				Able to apply architectural knowledge and skills to initiate and develop businesses independently in various roles of construction industry (Professional Architects, Contractors, Planning / Supervisory Consultants, Developers, etc.)
ADDITIONAL WORK ABILITIES - *as Academition* (in Accordance with the Interpretation of IAI & APTARI Competency Standards)						**ELO 07 – S6**
KK15	Able to apply architectural knowledge and skills in carrying out educational / teaching activities, research and community service in the field of architecture.	P1		P3		Able to apply architectural knowledge and skills to carry out educational / teaching, research and community service activities in the field of Architecture.
ADDITIONAL WORK ABILITIES - *as Bureaucrate* (in Accordance with the Interpretation of IAI & APTARI Competency Standards)						**ELO 08 – S7**
KK16	Able to apply architectural knowledge and skills in carrying out the development and implementation of policies related to the physical construction of buildings and their environment, based on architectural principles as well as relevant development / government administration principles.				P4	Able to apply architectural knowledge and skills to carry out the formulation and implementation of policies related to the physical construction of buildings and their environment, based on architectural principles and government administration principles.
KNOWLEDGE MASTERY – *in Philosophy, History, Theory, Criticism & Design Method in Architecture* (in Accordance with the Interpretation of IAI & APTARI Competency Standards)						**ELO 09 – K1**
PP1	Mastering in general the principles of architectural philosophy as the basis for the development of architectural knowledge and the conception of architectural knowledge as a science, art and design;			P3		Understand the architectural philosophy, history, criticism, research and design theory / methods, especially in the context of vernacular architecture of the coastal and hilly environment.
PP2	Mastering in depth aspects of the history / development / precedent of international architectural design;	P1	P2	P3	P4	
PP3	Mastering in depth the historical / developmental / precedent aspects of vernacular architectural design in coastal and hilly areas;	P1	P2	P3	P4	
PP4	Mastering in depth the concept of the scope of architectural theory and its application, including the theory of composing architectural forms and spaces, the theory of architectural functions and the theory of architectural design processes/methods;	P1	P2	P3		
PP5	Mastering in depth the aspects of the scope / domain, types / types and varieties of architectural research methods;			P3		
PP6	Mastering in general the basic conceptions of architectural criticism (understanding, methods, rhetoric and situations (settings) of architectural criticism);			P3		

ELABORATED ELOs FORMULATION		Grad. Profile Code				EQUIVALENT COMPRESSED ELOs
		P1	P2	P3	P4	
PP7	Mastering in depth the process, methods and strategies of architectural design based on contextual problems, especially those related to the method of analysis of design conceptual aspects (objects, sites and themes), as well as conceptualization methods both programmatic concepts (space programs) and the concept of configuration of architectural forms and spaces functional and meaningful.	P1	P2	P3		
KNOWLEDGE MASTERY – *in Aesthetics, Art & Culture* *(in Accordance with the Interpretation of IAI & APTARI Competency Standards)*						**ELO 10 – K2**
PP8	Mastering in depth the basic philosophy, theory and aesthetic principles of the bi-dimensional / tri-dimensional form and its relevance to architectural design;	P1	P2	P3		Understand the aesthetic conception, art and culture, especially in the context of vernacular architecture of the coastal and hilly environment.
PP9	Mastering in general the definition and classification of art, the principles of visual arts, and their relevance to architectural design;			P3	P4	
PP10	Mastering in general the meaning, dimensions and elements of culture, cultural heritage issues and their relevance to the architectural design of coastal and hilly areas,			P3	P4	
KNOWLEDGE MASTERY – *in Ecology & Building Science* *(in Accordance with the Interpretation of IAI & APTARI Competency Standards)*						**ELO 11 – K3**
PP11	Mastering in general the basic conceptions of human interaction with their environment, the conception of the natural environment as a systemic ecological unit and its various components (biotic/abiotic), basic climatological, hydrological and geological theories, as well as the characteristics of ecosystems with special patterns (coastal and hilly areas, humid tropics) , etc;			P3	P4	Understand the basic concepts of ecology, biodiversity, energy, water, life cycle of building materials, disaster risk, concepts of comfort in human-environment interaction, concepts and strategies of built environment system in a contextual design problems, especially in the context of vernacular architecture of the coastal and hilly environment.
PP12	Mastering in general issues of ecological sustainability, life cycle of building materials, conservation of biodiversity, energy and water, environmental impacts, waste management, as well as management / mitigation of natural disaster risks in coastal and hilly areas;	P1	P2	P3	P4	
PP13	Mastering in depth the theoretical conception of the physical components of the built environment of coastal and hilly areas (heat, light, sound, energy);			P3		
PP14	Mastering in depth the theoretical conceptions of thermal, visual, acoustic and olfactory comfort as well as the convenience of accessibility of energy and water resources, in the context of human interaction with the environment in coastal and hilly areas;	P1	P2	P3		
PP15	Mastering in depth the conception of the built environment (building) as a systemic unit as well as the conception of the working system of its various sub-systems, in particular the air system, lighting, sound system, water system and energy management;	P1	P2	P3	P4	
PP16	Mastering in depth the theoretical conception of the built environment control system, including microclimate control, passive control and active control of the indoor environment of the building;	P1	P2	P3	P4	
PP16	Mastering in depth the processes, methods and techniques of integrating the built environment control system into a functional unit that is effective and compatible with the configuration of form and space in an architectural object design related to contextual design problems.	P1	P2	P3		
KNOWLEDGE MASTERY – *in Building Technology* *(in Accordance with the Interpretation of IAI & APTARI Competency Standards)*						**ELO 12 – K4**

ELABORATED ELOs FORMULATION		Grad. Profile Code				EQUIVALENT COMPRESSED ELOs
		P1	P2	P3	P4	
PP18	Mastering in depth the theoretical concept of statics and engineering mechanics as a basis for structural engineering;	P1	P2	P3		Understand the aspects of building statics and mechanics, building materials, structural systems, utility sysetem, and the strategy for their integration in a contextual design problems, especially in the context of vernacular architecture of the coastal and hilly environment.
PP19	Mastering in depth the technological aspects of standard building materials (wood, concrete and steel) for building structural components and for building architectural components (non-structural), as well as aspects of precedents in innovation and evolution;	P1	P2	P3		
PP20	Mastering in depth the theoretical conceptions of building structure configuration systems and the principles of standard building construction for both structural components and architectural (non-structural) components of buildings, as well as aspects of precedents in innovation and evolution;	P1	P2	P3		
PP21	Mastering in depth the theoretical conception of standard building utility requirements and their various systems, as well as aspects of precedents in innovation and evolution;	P1	P2	P3		
PP22	Mastering in depth the processes, methods and technical strategies of integrating structural systems, construction and building utilities into functional units that are effective and compatible with the configuration of form and space in an architectural object design related to contextual design problems;	P1	P2	P3		
PP23	Mastering in general the theoretical conception of the implementation of building technology (application of materials, structures and construction as well as building utilities) related to the context of the location / site that is categorized as prone to natural disasters (floods, earthquakes, tidal waves, volcanic eruptions and so on)	P1	P2	P3	P4	
KNOWLEDGE MASTERY – *in Site Planning, Landscaping, Interior Design, Urban & Settlement Planning* *(in Accordance with the Interpretation of IAI & APTARI Competency Standards)*						**ELO 13 – K5**
PP24	Mastering in general the theoretical conceptions, standards and precedents of site planning and design practices;	P1	P2	P3		Understand the process, methods and strategies of integration of theoretical principles, standards and practice precedents for site planning, landscaping, landscaping, outdoor & interior design, urban and residential / settlement planning & design, especially in the context of vernacular architecture of the coastal and hilly environment.
PP25	Mastering in general the theoretical conceptions, standards and precedents of outdoor design practice;	P1	P2	P3		
PP26	Mastering in general the conceptions / theoretical rules, standards and practice precedents of coastal and hilly landscape design;	P1	P2	P3		
PP27	Mastering in general the theoretical conceptions/rules as well as the practice of space design in architecture (interior design);	P1	P2	P3		
PP28	Mastering in general the conception / theoretical principles, standards and precedents of urban planning and design practice;	P1	P2	P3	P4	
PP29	Mastering in general the theoretical conceptions/rules, standards and precedents for housing and settlement planning practices;	P1	P2	P3	P4	
PP30	Mastering in depth the process, methods and strategies of integration of theoretical principles, standards and practice precedents for site design, outdoor space, landscaping, interior design, urban and residential / residential design in the architectural object design process related to contextual design problems.	P1	P2	P3		
KNOWLEDGE MASTERY – *in Other Relevant Scientific Domains* *(in Accordance with the Interpretation of IAI & APTARI Competency Standards)*						**ELO 14 – K6**

ELABORATED ELOs FORMULATION		Grad. Profile Code				EQUIVALENT COMPRESSED ELOs
		P1	P2	P3	P4	
PP31	Mastering in general aspects of development administration, as well as relevant norms, regulations and standards for planning, design/design, and physical construction/construction activities of the built environment;	P1	P2	P3	P4	Understand other relevant aspects of the planning, design and physical development of built environment which includes : a) legal aspecst, project management & technical documentation, environmental sociology / psychology, professionalism, economics and business administration.
PP32	Mastering in general, the principles of drafting a technical design specification description document (RKS) and a cost planning document (RAB) as well as a variety of other technical documentation in relation to the management aspects of the physical construction process design of the built environment;	P1	P2	P3	P4	
PP33	Mastering in general the basics of sociology, the various needs of humans as individuals and social beings and the sociological context of a built environment / architecture of coastal and hilly areas;	P1	P2	P3	P4	
PP34	Mastering in general the theoretical conceptions of the roles and characteristics of clients, users and society as "super clients" in architectural design practice.	P1	P2	P3	P4	
PP35	Mastering in general the psychological principles of the built environment in relation to the behavioral aspects of the users of the built environment in coastal and hilly areas;	P1	P2	P3		
PP36	Mastering in depth the various potential roles of architectural scholars and the scope of their responsibilities in various fields of activity, both conventional and new, in local, regional and international contexts;	P1	P2		P4	
PP37	Mastering in depth various architectural professional contexts (business, financial and legal contexts);	P1	P2		P4	
PP38	Mastering in general aspects of professional ethics and working rules that apply in accordance with the professional role developed by an architectural scholar;	P1	P2		P4	
PP39	Mastering in general the conceptions of work procedures for various construction industries as the target work habitat for an architecture graduate;	P1	P2		P4	
PP40	Mastering in general the principles of economics and business as well as financial and financial aspects and their relevance to the development of various built environments, especially architectural objects.	P1	P2			

Table 3. PS-ARS ELOs Description (K-2020)

Num	AUN Category	Category On PS-ARS	Code	Descriptions	P1	P2	P3	P4	Main Reference
				Expected Learning Outcomes (ELOs) in Short	**Graduate Profile**				
1	ATTITUDE	ATTITUDES & VALUES	A1	Embodying a behavior setting that includes national patriotism; religious; humanistic; appreciative and tolerant to cultural and religious diversity; sensitive to social and natural environmental issues; obedience to the law; uphold academic ethics; responsible, independent, persevering, thriving and have entrepreneurial spirit.					SN-DIKTI / KKNI
2	SKILLS	GENERAL SKILLS	S1	Able to make decisions, apply or develop science, technology and art with logical, critical, systematic, innovative, creative, qualified and measurable thinking, independently or in group cooperation, based on valid data input and analysis, and well reported and documented.					
3		SPECIAL SKILL	S2	Able to perform various architectural communication techniques (mathematical & statistical expression; manual & computer aided drawings; oral & written verbal narratives) to support a design proposition.					IAI / APTARI
4		MAIN WORK ABILITIES	S3	Able to apply architectural knowledge and skills to design an architectural object based on a contextual design problems, especially on the coastal and hilly environment, and present the design result through communicative design documents.					
5		ADDITIONAL WORK ABILITIES	S4	Able to apply architectural knowledge and skills to carry out the physical construction process of an architectural object in relation to the efficiency of available resources and the applied legal aspects.					
6			S5	Able to apply architectural knowledge and skills to initiate and develop businesses independently in various roles of construction industry (Professional Architects, Contractors, Planning / Supervisory Consultants, Developers, etc.)					
7			S6	Able to apply architectural knowledge and skills to carry out educational / teaching, research and community service activities in the field of Architecture.					
8			S7	Able to apply architectural knowledge and skills to carry out the formulation and implementation of policies related to the physical construction of buildings and their environment, based on architectural principles and government administration principles.					
9	KNOWLEDGE	KNOWLEDGE MASTERY	K1	Understand the architectural philosophy, history, criticism, research and design theory / methods, especially in the context of vernacular architecture of the coastal and hilly environment.					
10			K2	Understand the aesthetic conception, art and culture, especially in the context of vernacular architecture of the coastal and hilly environment.					
11			K3	Understand the basic concepts of ecology, biodiversity, energy, water, life cycle of building materials, disaster risk, concepts of comfort in human-environment interaction, concepts and strategies of built environment system in a contextual design problems, especially in the context of vernacular architecture of the coastal and hilly environment.					
12			K4	Understand the aspects of building statics and mechanics, building materials, structural systems, utility sysetem, and the strategy for their integration in a contextual design problems, especially in the context of vernacular architecture of the coastal and hilly environment.					
13			K5	Understand the process, methods and strategies of integration of theoretical principles, standards and practice precedents for site planning, landscaping, landscaping, outdoor & interior design, urban and residential / settlement planning & design, especially in the context of vernacular architecture of the coastal and hilly environment.					
14			K6	Understand other relevant aspects of the planning, design and physical development of built environment which includes : a) legal aspecst, project management & technical documentation, environmental sociology / psychology, professionalism, economics and business administration.					

In addition to the various approaches, the formulation of ELOs in this study program is also carried out by considering the aspect of the depth of competence that exists in each ELOs item by referring to the pedagogic competency categorization in 'the four pillars of UNESCO', which is basically inspired by Bloom's taxonomy for education. This consideration leads to a 'limitation' of the depth of each learning outcome which in turn becomes the basis for determining the weight of learning activities in each course that is designed to achieve the existing learning outcomes. In the following, it can be seen the level of depth of each item of learning achievement in the summary of the ELOs formulation of this study program.

Table 4. Identification of ELOs Formulation in Generic & Specific Competency Categories (K-2020)

Expected Learning Outcomes (ELOs)		AUN Category of ELOs		Competence Category based on the interpretation of "the Four Pillars of UNESCO"				
				"to know"		"to do"	"to be"	"to live together"
Num	Code	Generic	Specific	Awareness	Understanding	Ability	Personal Behavior	Social Interaction
1	A1							
2	S1							
3	S2							
4	S3							
5	S4							
6	S5							
7	S6							
8	S7							
9	K1							
10	K2							
11	K3							
12	K4							
13	K5							
14	K6							

V. DOMAIN OF KNOWLEDGE AND COURSES

All courses in K-2020 are prepared for students to achieve ELOs. The ELOs formula is classified based on the categories of Attitude (according to SN-DIKTI), General Skills (according to SN-DIKTI), Special Skills / Work Ability (KKNI, IAI and APTARI), and Knowledge Mastery (KKNI, IAI and APTARI). The ELOs of these curricula have a relationship with study materials / domains of knowledge / skills in architectural education, namely: Architectural Communication Engineering; Philosophy, History, Theory, Research, Criticism & Architectural Design Methods; Aesthetics of Form, Art and Culture; Ecology & Building Science / Architecture; Building Technology; Site, Outdoor Space, Landscape, Indoor Space, City & Housing / Settlement; and others. This study material / domain is the main basis for the formation of all courses. The matrix of the relationship between ELO, study materials / domains and courses is hereinafter referred to as the Curriculum Map. The following is a table that shows the relationship between the formation of courses and ELO points related to the relevant course.

Referring to the ELOs formulation, PS-ARS further operationalizes the curriculum K-2020 which in general includes 42 courses with a total of 146 credits, which are planned to be fulfilled in 8 semesters. This curriculum consists of 4 National Compulsory Courses with a total of 8 credits (5%); 5 University Compulsory Courses with a total of 12 credits (9%); 1 Faculty Compulsory Course with a total of 2 credits (1%); and 32 Study Program Courses with a total of 124 credits (85%), within this there are 4 Courses with a total of 12 credits that should be chosen by students out of 8 Elective Courses provided, each with 3 credits.

All courses in curricula have a SKS load which is calculated based on the breadth and depth according to study materials in architectural education. List and grouping of courses in K-2020 can be seen also in Table 4.

Table 4. Curriculum Map on PS-ARS K-2020

NO	COURSE	A1	S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6	YEAR	SEMESTER	CREDITS	COURSES GROUP	QUALIFICATIN
		Attitude	\<-- Skill --\>							\<-- Knowledge --\>										
1	INDONESIAN	V	V	V				V	V							2	III	2	National Compulsory	Basic
2	CITIZENSHIP	V	V	V					V							2	III	2	National Compulsory	Basic
3	PANCASILA	V	V	V					V							1	I	2	National Compulsory	Basic
4	RELIGION	V	V	V					V							1	I	2	National Compulsory	Basic
5	ENTREPRENEURSHIP	V	V	V	V		V									4	VII	2	University Compulsory	Advance
6	PACIFIC	V	V	V												1	II	2	University Compulsory	Basic
7	ENGLISH	V	V	V				V	V							1	II	2	University Compulsory	Basic
8	INTERNSHIP	V	V	V	V	V	V	V	V							3	VI	2	University Compulsory (Required)	Intermediate
9	THEMATIC COMMUNITY SERVICE PROGRAM	V	V	V	V	V		V								4	VII	4	University Compulsory (Required)	Advance
10	ARTIFICIAL INTELEGENCE	V	V	V				V								2	IV	2	Faculty Compulsory	Intermediate
11	INTRODUCTION TO ARCHITECTURE	V	V	V				V		V	V					1	I	2	Study Program Subjects	Basic
12	ARCHITECTURE HISTORY / PRECEDENT	V	V	V				V		V	V					1	II	2	Study Program Subjects	Basic
13	VERNACULAR ARCHITECTURE IN COASTAL & HILLY AREAS	V	V	V				V		V	V					2	III	2	Study Program Subjects	Intermediate
14	ARCHITECTURE THEORY	V	V	V				V		V	V					2	IV	3	Study Program Subjects	Intermediate
15	ARCHITECTURE RESERCH	V	V	V				V		V	V	V	V	V		4	VII	2	Study Program Subjects	Advance
16	ENVIRONTMENTAL SCIENCE	V	V	V				V				V	V			1	I	2	Study Program Subjects	Basic
17	BUILDING SCIENCE / PHISYCS IN COASTAL & HILLY AREAS	V	V	V				V				V	V			2	III	3	Study Program Subjects	Intermediate
18	ARCHITECTURE SCIENCE	V	V	V				V				V	V			2	IV	3	Study Program Subjects	Intermediate
19	BUILDING STATICS & MECHANICS	V	V	V		V		V				V	V			1	I	3	Study Program Subjects	Basic
20	MATERIALS BUILDING TECHNOLOGY	V	V	V		V		V				V	V			1	II	3	Study Program Subjects	Basic
21	BUILDING STRUCTURE & CONSTRUCTION	V	V	V		V		V				V	V			2	III	3	Study Program Subjects	Intermediate

NO	COURSE	A1	S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6	YEAR	SEMESTER	CREDITS	COURSES GROUP	QUALIFICATION
22	BUILDING UTILITY	V	V	V		V		V				V	V			2	IV	3	Study Program Subjects	Intermediate
23	LANDSCAPE IN COASTAL & HILLY AREAS	V	V	V				V			V			V		3	V	3	Study Program Subjects	Intermediate
24	INTERIOR DESIGN	V	V	V				V			V			V		3	VI	3	Study Program Subjects	Intermediate
25	CITY & SETTLEMENT	V	V	V				V			V			V		4	VII	3	Study Program Subjects	Advance
26	LAW IN DEVELOPMENT	V	V	V		V	V	V	V					V		3	V	2	Study Program Subjects	Intermediate
27	ENGINEERING DOCUMENTATION & PROJECT MANAGEMENT	V	V	V		V	V	V	V					V		4	VII	3	Study Program Subjects	Advance
28	INTRODUCTION TO PROFESSION	V	V	V	V	V	V	V	V					V		4	VII	2	Study Program Subjects	Advance
29	ARCHITECTURE MATHEMATICS & STATISTICS	V	V	V		V		V			V					1	I	3	Study Program Subjects	Basic
30	COMPUTER-BASED ARCHITECTURAL COMMUNICATION	V	V	V		V		V			V					1	II	3	Study Program Subjects	Basic
31	SMART BUILDING	V	V	V				V				V	V			3	V	3	Study Program Subjects (Elective)	Advance
31	ARCHITECTURE & CULTURE IN COASTAL & HILLY AREAS	V	V	V				V		V	V			V		3	V	3	Study Program Subjects (Elective)	Advance
32	STRATEGIC ISSUES FOR ENVIRONMENTAL MANAGEMENT IN COASTAL & HILLY AREAS	V	V	V				V			V	V	V	V		3	VI	3	Study Program Subjects (Elective)	Advance
32	INTRODUCTION TO ECONOMICS & BUSINESS	V	V	V		V	V	V						V		3	VI	3	Study Program Subjects (Elective)	Basic
33	ARCHITECTURE CRITIQUE	V	V	V				V		V	V					3	V	3	Study Program Subjects (Elective)	Advance
33	DISASTER RESPONSE BUILDING TECHNOLOGY	V	V	V				V				V	V			3	V	3	Study Program Subjects (Elective)	Advance
34	INTRODUCTION TO ENVIRONMENTAL SOCIOLOGY	V	V	V				V		V	V			V	V	3	VI	3	Study Program Subjects (Elective)	Basic
34	INTRODUCTION TO ENVIRONMENTAL PSYCHOLOGY IN COASTAL & HILLY AREAS	V	V	V				V		V	V			V	V	3	VI	3	Study Program Subjects (Elective)	Basic
35	BASIC ARCHITECTURE DESAIN	V	V	V	V			V		V	V	V	V	V	V	1	I	6	Study Program Subjects	Basic
36	1st ARCHITECTURE DESIGN	V	V	V	V			V		V	V	V	V	V	V	1	II	8	Study Program Subjects (Core-Required)	Intermediate
37	2nd ARCHITECTURE DESIGN	V	V	V	V			V		V	V	V	V	V	V	2	III	8	Study Program Subjects (Core-Required)	Intermediate
38	3rd ARCHITECTURE DESIGN	V	V	V	V			V		V	V	V	V	V	V	2	IV	9	Study Program Subjects (Core-Required)	Intermediate
39	4th ARCHITECTURE DESIGN	V	V	V	V			V		V	V	V	V	V	V	3	V	9	Study Program Subjects (Core-Required)	Advance
40	5th ARCHITECTURE DESIGN	V	V	V	V			V		V	V	V	V	V	V	3	VI	9	Study Program Subjects (Core-Required)	Advance
41	PRE - FINAL PROJECT	V	V	V	V			V		V	V	V	V	V	V	4	VII	4	Study Program Subjects (Core-Required)	Advance
42	FINAL PROJECT	V	V	V	V	V		V		V	V	V	V	V	V	4	VIII	6	Study Program Subjects (Core-Required)	Advance

Note: Rows 31 & 32 are grouped as "1st & 2nd Elective"; rows 33 & 34 are grouped as "3rd & 4th Elective". Column group headers: 1 = Attitude (A1); 2–8 = Skill (S1–S7); 9–14 = Knowledge (K1–K6), under EXPECTED LEARNING OUTCOMES.

Table 5.   ELOs Weighting in Curriculum Map K-2020

NO	COURSE	EXPECTED LEARNING OUTCOMES														YEAR	SEMESTER	CREDITS	COURSES GROUP	QUALIFICATIN
		1	2	3	4	5	6	7	8	9	10	11	12	13	14					
		Attitude	Skill							Knowledge										
		A1	S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6					
1	INDONESIAN	1,27%	1,27%	1,27%				1,35%	10,53%							2	III	2	National Compulsory	Basic
2	CITIZENSHIP	1,27%	1,27%	1,27%					10,53%							2	III	2	National Compulsory	Basic
3	PANCASILA	1,27%	1,27%	1,27%					10,53%							1	I	2	National Compulsory	Basic
4	RELIGION	1,27%	1,27%	1,27%					10,53%							1	I	2	National Compulsory	Basic
5	ENTREPRENEURSHIP	1,27%	1,27%	1,27%	2,90%	0,00%	14,29%									4	VII	2	University Compulsory	Advance
6	PACIFIC	1,27%	1,27%	1,27%												1	II	2	University Compulsory	Basic
7	ENGLISH	1,27%	1,27%	1,27%				1,35%	10,53%							1	II	2	University Compulsory	Basic
8	INTERNSHIP	1,27%	1,27%	1,27%	2,90%	5,00%	14,29%	1,35%	10,53%							3	VI	2	University Compulsory (Required)	Intermediate
9	THEMATIC COMMUNITY SERVICE PROGRAM	2,53%	2,53%	2,53%	5,80%	10,00%		2,70%								4	VII	4	University Compulsory (Required)	Advance
10	ARTIFICIAL INTELEGENCE	1,27%	1,27%	1,27%				1,35%								2	IV	2	Faculty Compulsory	Intermediate
11	INTRODUCTION TO ARCHITECTURE	1,27%	1,27%	1,27%				1,35%		2,44%	2,00%					1	I	2	Study Program Subjects	Basic
12	ARCHITECTURE HISTORY / PRECEDENT	1,27%	1,27%	1,27%				1,35%		2,44%	2,00%					1	II	2	Study Program Subjects	Basic
13	VERNACULAR ARCHITECTURE IN COASTAL & HILLY AREAS	1,27%	1,27%	1,27%				1,35%		2,44%	2,00%					2	III	2	Study Program Subjects	Intermediate
14	ARCHITECTURE THEORY	1,90%	1,90%	1,90%				2,03%		3,66%	3,00%					2	IV	3	Study Program Subjects	Intermediate
15	ARCHITECTURE RESERCH	1,27%	1,27%	1,27%				1,35%		2,44%	2,00%	2,22%	2,22%	2,44%		4	VII	2	Study Program Subjects	Advance
16	ENVIRONTMENTAL SCIENCE	1,27%	1,27%	1,27%				1,35%				2,22%	2,22%			1	I	2	Study Program Subjects	Basic
17	BUILDING SCIENCE / PHISYCS IN COASTAL & HILLY AREAS	1,90%	1,90%	1,90%				2,03%				3,33%	3,33%			2	III	3	Study Program Subjects	Intermediate
18	ARCHITECTURE SCIENCE	1,27%	1,27%	1,27%				1,35%	10,53%							2	IV	3	Study Program Subjects	Intermediate
19	BUILDING STATICS & MECHANICS	1,90 %	1,90 %	1,90 %		7,50%		2,03 %				3,33%	3,33%			1	I	3	Study Program Subjects	Basic
20	MATERIALS BUILDING TECHNOLOGY	1,90 %	1,90 %	1,90 %		7,50%		2,03 %				3,33%	3,33%			1	II	3	Study Program Subjects	Basic

NO	COURSE		A1	S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6	YEAR	SEMESTER	CREDITS	COURSES GROUP	QUALIFICATIN
			Attitude	Skill							Knowledge										
21	BUILDING STRUCTURE & CONSTRUCTION		1,90%	1,90%	1,90%		7,50%		2,03%				3,33%	3,33%			2	III	3	Study Program Subjects	Intermediate
22	BUILDING UTILITY		1,90%	1,90%	1,90%		7,50%		2,03%				3,33%	3,33%			2	IV	3	Study Program Subjects	Intermediate
23	LANDSCAPE IN COASTAL & HILLY AREAS		1,90%	1,90%	1,90%				2,03%			3,00%			3,66%		3	V	3	Study Program Subjects	Intermediate
24	INTERIOR DESIGN		1,90%	1,90%	1,90%				2,03%			3,00%			3,66%		3	VI	3	Study Program Subjects	Intermediate
25	CITY & SETTLEMENT		1,90%	1,90%	1,90%				2,03%			3,00%			3,66%		4	VII	3	Study Program Subjects	Advance
26	LAW IN DEVELOPMENT		1,27%	1,27%	1,27%		5,00%	14,29%	1,35%	10,53%						2,67%	3	V	2	Study Program Subjects	Intermediate
27	ENGINEERING DOCUMENTATION & PROJECT MANAGEMENT		1,90%	1,90%	1,90%		7,50%	21,43%	2,03%	15,79%						4,00%	4	VII	3	Study Program Subjects	Advance
28	INTRODUCTION TO PROFESSION		1,27%	1,27%	1,27%	2,90%	5,00%	14,29%	1,35%	10,53%						2,67%	4	VII	2	Study Program Subjects	Advance
29	ARCHITECTURE MATHEMATICS & STATISTICS		1,90%	1,90%	1,90%		7,50%		2,03%			3,00%					1	I	3	Study Program Subjects	Basic
30	COMPUTER-BASED ARCHITECTURAL COMMUNICATION		1,90%	1,90%	1,90%		7,50%		2,03%			3,00%					1	II	3	Study Program Subjects	Basic
31	1st & 2nd Elective — SMART BUILDING		1,90%	1,90%	1,90%				2,03%				3,33%	3,33%			3	V	3	Study Program Subjects (Elective)	Advance
31	1st & 2nd Elective — ARCHITECTURE & CULTURE IN COASTAL & HILLY AREAS		1,90%	1,90%	1,90%				2,03%		3,66%	3,00%			3,66%		3	V	3	Study Program Subjects (Elective)	Advance
32	1st & 2nd Elective — STRATEGIC ISSUES FOR ENVIRONMENTAL MANAGEMENT IN COASTAL & HILLY AREAS		1,90%	1,90%	1,90%				2,03%			3,00%	3,33%	3,33%	3,66%		3	VI	3	Study Program Subjects (Elective)	Advance
32	1st & 2nd Elective — INTRODUCTION TO ECONOMICS & BUSINESS		1,90%	1,90%	1,90%		7,50%	21,43%	2,03%							4,00%	3	VI	3	Study Program Subjects (Elective)	Basic
33	3rd & 4th Elective — ARCHITECTURE CRITIQUE		1,90%	1,90%	1,90%				2,03%		3,66%	3,00%					3	V	3	Study Program Subjects (Elective)	Advance
33	3rd & 4th Elective — DISASTER RESPONSE BUILDING TECHNOLOGY		1,90%	1,90%	1,90%				2,03%				3,33%	3,33%			3	V	3	Study Program Subjects (Elective)	Advance
34	3rd & 4th Elective — INTRODUCTION TO ENVIRONMENTAL SOCIOLOGY		1,90%	1,90%	1,90%				2,03%		3,66%	3,00%			3,66%	4,00%	3	VI	3	Study Program Subjects (Elective)	Basic

NO	COURSE	A1 (Attitude)	S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6	YEAR	SEMESTER	CREDITS	COURSES GROUP	QUALIFICATIN
	INTRODUCTION TO ENVIRONMENTAL PSYCHOLOGY IN COASTAL & HILLY AREAS	1,90%	1,90%	1,90%	0,00%			2,03%		3,66%	3,00%			3,66%	4,00%	3	VI	3	Study Program Subjects (Elective)	Basic
35	BASIC ARCHITECTURE DESAIN	3,80%	3,80%	3,80%	8,70%			4,05%		7,32%	6,00%	6,67%	6,67%	7,32%	8,00%	1	I	6	Study Program Subjects	Basic
36	1st ARCHITECTURE DESIGN	5,06%	5,06%	5,06%	11,59%			5,41%		9,76%	8,00%	8,89%	8,89%	9,76%	10,67%	1	II	8	Study Program Subjects (Core-Required)	Intermediate
37	2nd ARCHITECTURE DESIGN	5,06%	5,06%	5,06%	11,59%			5,41%		9,76%	8,00%	8,89%	8,89%	9,76%	10,67%	2	III	8	Study Program Subjects (Core-Required)	Intermediate
38	3rd ARCHITECTURE DESIGN	5,70%	5,70%	5,70%	13,04%			6,08%		10,98%	9,00%	10,00%	10,00%	10,98%	12,00%	2	IV	9	Study Program Subjects (Core-Required)	Intermediate
39	4th ARCHITECTURE DESIGN	5,70%	5,70%	5,70%	13,04%			6,08%		10,98%	9,00%	10,00%	10,00%	10,98%	12,00%	3	V	9	Study Program Subjects (Core-Required)	Advance
40	5th ARCHITECTURE DESIGN	5,70%	5,70%	5,70%	13,04%			6,08%		10,98%	9,00%	10,00%	10,00%	10,98%	12,00%	3	VI	9	Study Program Subjects (Core-Required)	Advance
41	PRE - FINAL PROJECT	2,53%	2,53%	2,53%	5,80%			2,70%		4,88%	4,00%	4,44%	4,44%	4,88%	5,33%	4	VII	4	Study Program Subjects (Core-Required)	Advance
42	FINAL PROJECT	3,80%	3,80%	3,80%	8,70%	15,00%		4,05%		7,32%	6,00%	6,67%	6,67%	7,32%	8,00%	4	VIII	6	Study Program Subjects (Core-Required)	Advance

All courses in curricula are also qualified by grade. In detail, the K-2020 curriculum consists of 17 basic level courses with a total load of 45 credits (29%); 14 intermediate level courses with a total load of 54 credits (34%); and 15 advanced courses with a total load of 59 credits (37%). This calculation includes the 8 elective courses offered. Both curricula also contain several required courses. In the K-2020 curriculum, there are 9 required subjects consisting of 7 core courses and 2 compulsory university courses.

All courses with SKS load in curricula are distributed into the semester system, where it takes 8 semesters to complete all courses. This distribution takes into account the burden of credits each semester, where in semesters I to VI 20 credits are charged. For K-2020 in semester VII, 20 credits are charged for 7 courses, while in semester VIII there are 6 credits for 1 course, namely Final Project. Semester VIII in curricula is devoted to Final Project courses, where students are required to follow the Final Project Studio procedure.

The arrangement of the curricula has a hierarchical structure based on the character of the Study Program education system called the 'Integrated Core'. This system adheres to a comprehensive competency content. This can be seen in the implementation of the system where in the curriculum there are compulsory subject categories which are arranged hierarchically, and become the core of the curriculum, namely Architectural Design. Other courses will support and become entry skills / entry behavior for the compulsory course. This category of Architectural Design courses is designed as a group of courses that will ensure the achievement of the profile of PS-ARS graduates, with two contents, the 'cognitive / conceptual part' and 'design exploration / transformation part'.

Figure 3 shows an overview of the integrated PS-ARS curriculum structure, especially for K-2020.
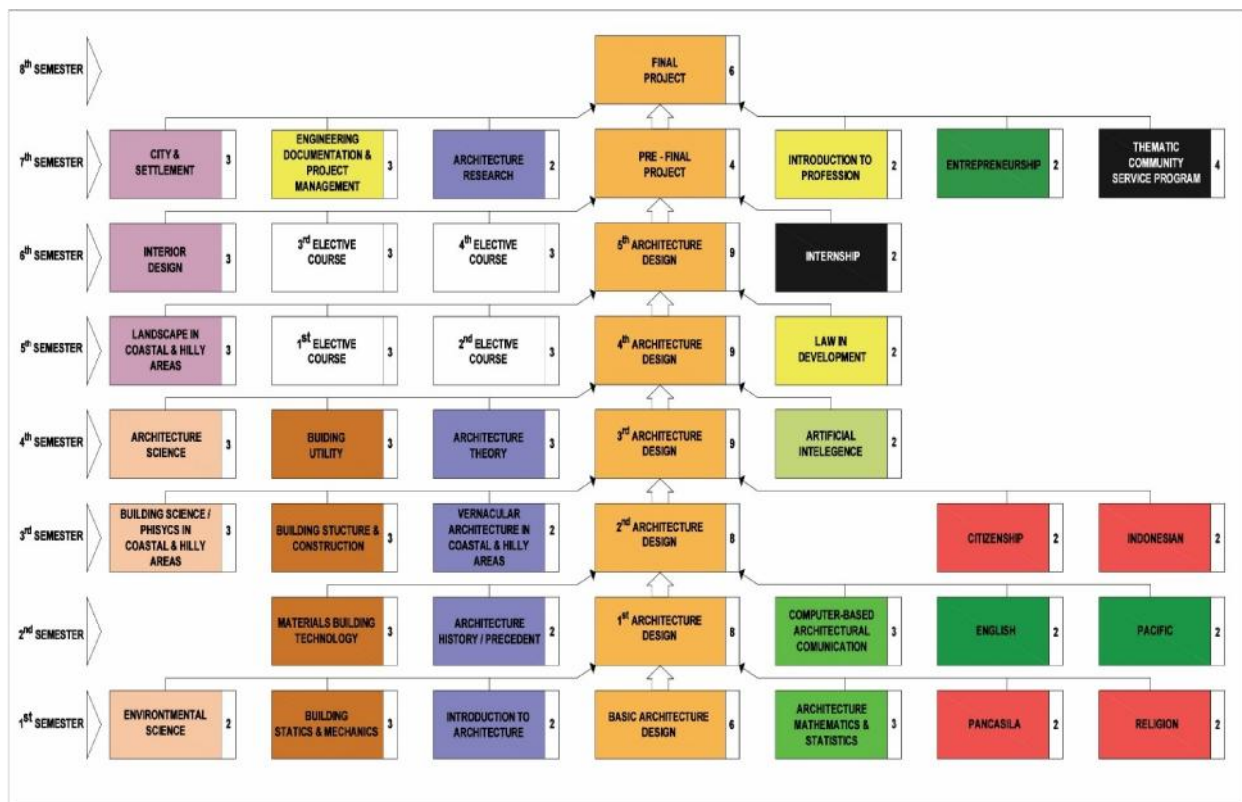

Figure 3.The Integrative Curriculum Structure on PS-ARS K-2020

VI. TEACHING AND LEARNING

The implementation of teaching and learning activities based on the existing curriculum, as well as research and community service activities as the three pillars of higher education at PS-ARS along with monitoring and evaluation efforts and efforts to improve them, are carried out by empowering all available resources.

PS-ARS educational philosophy is based on the philosophy of Dr. G.S.S.J. Ratulangi called "Si Tou Timou Tumo Tou" shortened ST4, which means humans live to humanize other humans. This educational philosophy is well known by the community and has been popularized not only on campus but also throughout North Sulawesi region. This philosophy is basically adapt as the philosophy of education of UNSRAT as mentioned in the latest Strategic Plan document. The PS-ARS adopts this philosophy and develops it into a one of historical foundation its strategic plan and also the curriculum. The philosophy of ST4 was conveyed by each academic community, especially department leaders, PS-ARS leaders and lecturers and has been conveyed to all stakeholders through the strategic plan document of Architecture Department, scientific publications, brochures, scientific meetings, internet social media, and web sites (UNSRAT & FATEK).

As a philosophy, ST4 means a total human development where everyone must inherit the values of their ancestors, especially from the Minahasa ethnic group, namely the *Ngaasan*, *Niatean*, and *Mawai* value. *'Ngaasan'* has the meaning of having wisdom. *'Niatean'* means having a strong spirit and will with the understanding that once it is decided never to give up. *'Mawai'* as the third value means physically and mentally strong.

The essence of the educational philosophy of ST4 that has been adopted is basically animating every course that exists in the PA-ARS. But in order to instill these values, the PS-ARS includes the substance of this educational philosophy in the Pancasila course. The substance of the philosophy of ST4 is taught to new students in the 1st semester with the aim that students will know and understand the substance of this educational philosophy as early as possible, so that they can adjust to all the courses to be studied next. The implementation of this educational philosophy value ultimately culminates in the student final assignment assessment system. The PS-ARS determines a 10% of the Final Project score value on the academic attitude shown by students when taking the Comprehensive Exam.

The Industrial Revolution 4.0 affects the PS-ARS to review and evaluate the curriculum and produce the K-2020. K-2020 curriculum is also structured based on a set of graduate learning outcomes (ELOs). The process for the K-2020 begins with compiling and establishing the graduate profiles ant the ELOs. Based on the ELOs, the study program constructs K-2020 curriculum in a systematic manner where this arrangement produces courses that are synergistic and integrated with one another. Each course has its own ELOs so that in the future, when conducting tracer studies, each of these courses will be measured. To implement each subject, the Study Program prepares a Semester Learning Plan (RPS). The K-2020 has just begun to be implemented in academic year of 2020/2021 into the teaching and learning process so that its achievement cannot yet be measured. Graduates of the 2020 curriculum products are expected to start happening in 2023 and beyond.

The PS-ARS ELOs has been prepared by taking into account the depth of competence in each item. The study program teaching and learning process is designed to be in line

with the ELOs. Thus, the teaching and learning process will be in line with the achievement of ELOs.

The SCL-based learning system (student centered learning) has been adopted by the study program in implementing the learning process within K-2020. SCL is an approach to the teaching and learning process. This approach provides freedom for students to have the opportunity and facilities to explore their own knowledge so that deep learning will be obtained and able to improve the quality of students. Previously, before the implementing of the K-2015, PS-ARS still used the Teacher Centered Learning (TCL) approach. With the transition from TCL to SCL, the lecturer only acts as a facilitator. Students get a bigger role so that they directly increase their competence.

Table 5. The Relationship Between ELOs and the Teaching & Learning Methods

Num	Teaching & Learning Activities	ELO 01	ELO 02	ELO 03	ELO 04	ELO 05	ELO 06	ELO 07	ELO 08	ELO 09	ELO 10	ELO 11	ELO 12	ELO 13	ELO 14
1	Lecture	v	v	v	v			v		v	v	v			
2	Response Method	v	v	v	v			v	v	v	v	v			
3	Subjective Assistance	v	v	v	v			v		v	v	v			
4	Formative Execercises	v	v	v	v			v		v	v	v			
5	Seminar dan Discussion	v	v	v	v	v	v	v	v	v	v		v	v	v
6	Tutorial	v	v		v		v	v	v	v	v	v	v	v	v
7	Design Exercise Task	v	v	v	v	v	v	v		v	v		v	v	v
8	Studio Consultation / Assistance	v	v	v	v	v	v	v	v	v	v	v	v	v	v
9	Interactive Lecturing	v	v	v	v		v	v	v	v	v	v	v	v	v
10	Class Discussion	v	v	v	v	v	v	v	v	v	v	v	v	v	v
11	Online Discussion	v	v	v	v	v	v	v	v	v	v	v	v	v	v
12	Group Discussion	v	v	v	v		v	v	v	v	v	v	v	v	v
13	Lecture With Display	v	v	v	v			v		v	v	v			
14	Recitation Lecture	v	v	v	v			v	v	v	v	v			
15	Case Study/ Problem Set	v	v	v	v		v	v		v	v	v			
16	Personal Assignment	v	v	v	v			v	v	v	v	v	v	v	v
17	Grup Assigment	v	v	v	v			v	v	v	v				
18	Study Tour	v	v	v	v			v		v	v				
19	Field Observation	v	v	v	v			v		v	v	v			
20	Internship	v	v	v	v			v		v	v	v			

In the implementation of K-2020, PS ARS has adopted eight key competencies for life-long learning. The key competencies are, 1 communication in the mother tongue, 2 communication using foreign languages, 3 mathematical competencies and basic competencies in science and technology, 4 digital competencies, 5 Learning to learn, 6 social and societal competencies, 7 initiative and entrepreneurial attitudes, 8 cultural awareness and expression. These eight key competencies are in line with ELOs which are formulated based on KKNI and SN-DIKTI as well as IAI and APTARI competency standards. In addition to being generally applied by lecturers through the teaching and learning methods listed in each RPS course, these eight competencies are also applied directly in the teaching and learning process with the courses as described below. The purpose of incorporating key competencies into courses is to build the capacity of students to continue learning throughout their lives. Students are convinced that the learning process is a dynamic and lifelong process.

Table 6. Relationship between Teaching & Learning Activities and Key Competencies of Lifelong Learning

Num	Teaching & Learning Activities / Methods	Lifelong Learning Key Competencies							
		1	2	3	4	5	6	7	8
1	Lecture	v	v	v	v				v
2	Response Method	v		v	v				v
3	Subjective Assistance	v		v	v		v		v
4	Formative Execercises	v		v					
5	Seminar dan Discussion	v		v	v		v		
6	Tutorial	v		v	v				v
7	Design Exercise Task	v		v	v				
8	Studio Consultation / Assistance	v		v				v	v
9	Interactive Lecturing	v		v	v	v		v	v
10	Class Discussion	v	v	v	v	v		v	v
11	Online Discussion	v	v	v	v	v		v	v
12	Group Discussion	v	v	v	v	v		v	v
13	Lecture With Display	v	v	v	v			v	v
14	Recitation Lecture	v	v	v				v	
15	Case Study/ Problem Set	v		v					
16	Personal Assignment	v		v		v			
17	Grup Assigment	v		v		v			v
18	Study Tour	v	v			v	v		v
19	Field Observation	v		v		v	v		v
20	Internship	v	v			v	v	v	v

Table 7. Relationship between Teaching & Learning Activities and Key Competencies of Lifelong Learning

Num	Lifelong Learning Key Competencies	Course Associated
1	Communication in the mother tongue	- Bahasa Indonesia
2	Communication using foreign languages	- English
3	Mathematical competencies and basic competencies in science and technology	- Architectureal Mathematics & Statistics - Building Statics & Mechanics - Basic of Architectural Design - Building Material & Technology - Building Physics & Science of Coastal & Hilly Environment - Building Structure & Construction - Architectural Desig - Building Utility - Disaster Responsive Building Technology - Final Project
4	Digital competencies	- Computer Based Architectural Communication Techinque - Artifisial Intelligence - Smart Building
5	Learning to learn	- Archictectural Research
6	Social and societal competencies	- Intriduction to Built Environment Sosiology
7	Initiative and entrepreneurial attitudes,	- Enterpreneurship - Project Management & Technical Documentation
8	Cultural awareness and expression	- Pancasila - Architecture & Culture of Coastal & Hilly Environment

In its implementation, lifelong learning is clearly reflected in the Architectural Design and Final Project group. The course groups are designed with the support of excellent studio facilities. The goal is that students experience a job simulation that is analogous to the situation the student will face after completing his studies. It specifically provides industry experience that he will be in throughout his life. Student and lecturer consultation takes place in the studio with an atmosphere like that of architectural bureaus. In the studio process, the lecturer functions as a facilitator as well as a client simulatively. Students design according to structured assignments with design stages starting from understanding design assignments, developing according to architectural approaches and theories, collecting and interpreting data, designing concepts, testing concepts and finalizing design work.