AUN-QA SELF ASSESSMENT REPORT
BACHELOR OF CIVIL ENGINEERING

FACULTY OF ENGINEERING HASANUDDIN UNIVERSITY, MAKASSAR, INDONESIA

September 2016

LIST OF ABBREVIATIONS

ASCE	:	American Society of Civil Engineers
AUN	:	Asean University Network
CESP	:	Civil Engineering Study Program
CGP	:	Cumulative Grade Point
DGHE	:	Directorate General of Higher Education
ELO	:	Expected Learning Outcomes
GFC	:	Group of Faculty member Competence
GPA	:	Grade Point Average
INQF	:	Indonesian National Qualification Framework
JICA	:	Japan International Cooperation Agency
KKNI	:	*Kerangka Kompetensi Nasional Indonesia* (Indonesian National Qualification Framework)
LBE	:	Laboratory Based Education
SCL	:	Student Center Learning
TCL	:	Teaching Center Learning

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1. EXPECTED LEARNING OUTCOMES

1.1. The ELO Have Been Clearly Formulated and Aligned With the Vision and Mission of the University

The basic formulation of Expected Learning Outcomes (ELO) of Civil Engineering Study Program (CESP) referred to the body of knowledge of civil engineering as defined by American Society of Civil Engineers (ASCE) i.e., *the profession in which a knowledge of the mathematical and physical sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the progressive well-being of humanity in creating, improving and protecting the environment, in providing facilities for community living, industry and transportation, and in providing structures for the use of humanity* (ASCE, 2008).

In addition to that body of knowledge, the formulation of ELO of CESP also considered to the profiles of civil engineer as mentioned in the global vision 2025 of ASCE as follows: "*Entrusted by society to create a sustainable world and enhance the global quality of life, civil engineers serve competently, collaboratively, and ethically as master:*

- *planners, designers, constructors, and operators of society's economic and social engine, the built environment;*
- *stewards of the natural environment and its resources;*
- *innovators and integrators of ideas and technology across the public, private, and academic sectors;*
- *managers of risk and uncertainty caused by natural events, accidents, and other threats; and*
- *leaders in discussions and decisions shaping public environmental and infrastructure policy.*

As used in the vision, "master" means one who possesses widely recognized and valued knowledge, skills, and attitudes acquired as a result of education, experience, and achievement (ASCE, 2008).

To pursue the vision, ASCE Body of Knowledge introduces 24 outcomes which are grouped into 3 categories. Furthermore, these outcomes are classified based on Bloom taxonomy of learning domains. The outcomes which fulfilled through the bachelor's

degree are:

1. Fundamental outcomes:
   Mathematics, Natural sciences, Humanities, and Social sciences
2. Technical outcomes:
   Materials science, Mechanics, Experiments, Problem recognition and solving, Design, Sustainability, Contemporary issues and historical perspectives, Risk and uncertainty, Project management, Breadth in civil engineering areas, and Technical specialization
3. Professional outcomes:
   Communication, Public policy, Business and public administration, Globalization, Leadership, Teamwork, Attitudes, Lifelong learning, and Professional and ethical responsibility

On the other hand, the hierarchy of national education is regulated by Presidential Decree number 8/2012 regarding national qualifications frame work in Indonesia. In that regulation, qualification for undergraduate education is determined at level 6 as described as follows:

1. Capable to apply science, technology and art within her/his expertise and adaptable to various situations faced during solving a problem
2. Mastering in-depth general and specific theoretical concepts of a certain knowledge and capable to formulate related problem solving procedure.
3. Capable to take strategic decision based on information and data analysis and provides direction in choosing several alternative solutions.
4. Responsible for her/his own job and can be assigned to take responsibility of the attainment of organization's performances.

Moreover, the Consultative Board of Civil Engineering Higher Education in Indonesia carried out a national conference in 2015 which issued a core curriculum for civil engineering education in Indonesia (*Exhibit 1.1*). This competence based curriculum is intended to deliver graduates who have the capability to:

1. Implement and develop civil engineering knowledge based on the market demand
2. Gain certain attitude in socializing within national and international society
3. Pursue the innovation of science and technology both nationally and internationally

The other main considerations are the vision-mission of Hasanuddin University and Engineering Faculty. Hasanuddin University's vision is to become leader and center of development for humanities, science, technology, arts and culture based on Indonesian maritime continent. The mission of UNHAS is: (1) providing a quality learning environment for developing innovative and proactive learning capacity, (2) preserving, developing, discovering and creating science, technology, art and culture, (3) implementing and disseminating science, technology, art and culture for the benefit of Indonesian Maritime Continent.

Meanwhile, Engineering Faculty's vision is to become leading institution in engineering sector for global sustainability with the spirit of maritime culture. The mission of Engineering Faculty is: (1) to develop education and community service that is comprehensive and engineering research-oriented, in line with the spirit of maritime culture, (2) to provide engineering graduates who are knowledgeable with critical thinking, mastering advanced technology, and have innovative and creative works, (3) to build excellence engineering center through international partnership for sustainable development. (4) to disseminate suitable technologies to improve the quality of life and to maintain the sustainability of natural resources.

Based on the above considerations, the vision of Civil Engineering Hasanuddin University (CESP) is prescribed to be an excellent and sustainable education center within the global network of science and technology of maritime infrastructure. The mission of CESP is: (1) to provide civil engineering education in a sustainable and internationally qualified to support community life, (2) to organize quality and innovative maritime based research which contribute significantly to the development of science, technology, and industry locally, regionally and globally, (3) to carry out community service activities that proactively support the improvement of public welfare.

CESP also consider the unique factor regarding its location that is in eastern part of Indonesia which is an archipelago comprising thousands of islands. This indicates that most of the civil engineering infrastructure is affected by the properties of maritime environment. Therefore, CESP has set the maritime substance as additional consideration for its current curriculum.

In accordance with the above considerations, the learning outcomes of CESP are arranged into three categories, those are: (1) generic skill and knowledge, (2) Specific skill and knowledge and (3) attitude. Therefore, the expected learning outcomes (ELO) of CESP are listed as follows:

1. An ability to apply knowledge of mathematics, science, and civil engineering.
2. An ability to apply the infrastructure design process which meet a well-defined set of requirements and standards.
3. An ability to apply civil engineering fundamental knowledge in overall phase of construction process (supervision, execution) and research activities.
4. Ability to identify engineering problems, formulate alternatives, and recommend feasible solutions
5. An ability to play a role in a team with various disciplines.
6. An understanding of professional and ethical responsibility.
7. An ability to interact effectively both in national and international society.
8. An ability to diagnose comprehensively the impact of engineering process in the context of economic, environmental, legal, and social aspects.
9. An ability to pursue the development of civil engineering science and technology.

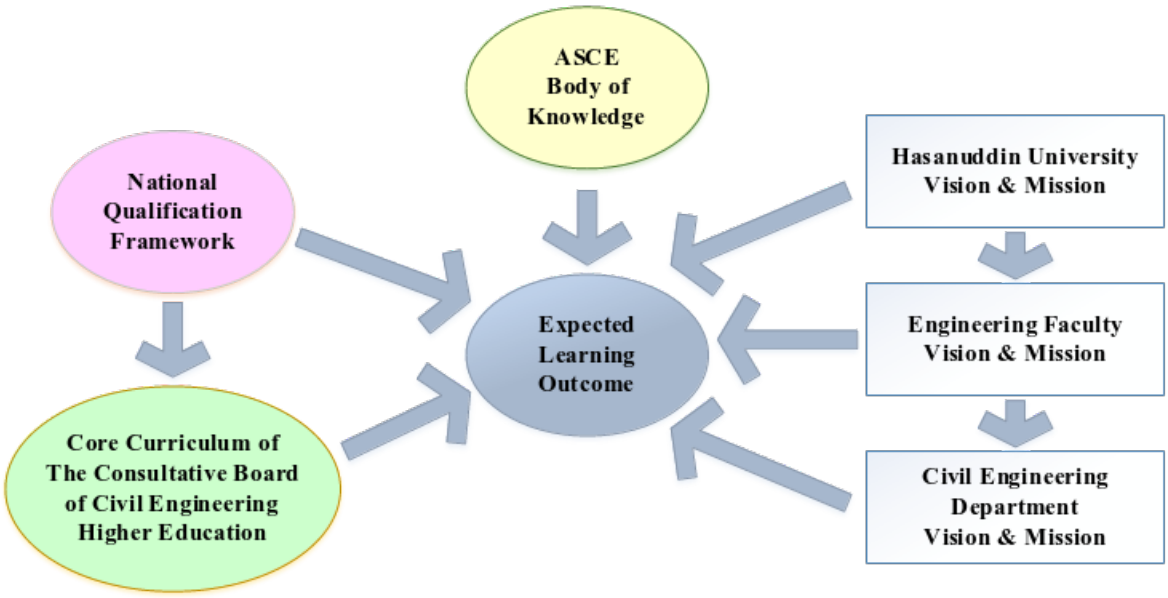

Figure 1-1 ELO formulation approach

Table 1-1 Link between ELO and the mission of University, Engineering Faculty, and CESP

ELO	University Mission	Engineering Faculty Mission	Civil Engineering Department Mission
1	1, 3	1	1, 2
2	3	1	1, 2
3	1	1	1, 2
4	2	1	1, 2
5	1	2	1, 2, 3
6	1	2	1, 2, 3
7	1	3, 4	2, 3
8	2	2	1, 2, 3
9	2	1, 4	1, 2

The essence of engineering is the iterative process of designing, predicting performance, building, and testing. CESP recommends that this process be introduced to students from the earliest stages of the curriculum, including the first year. CESP curriculum is designed to achieve the ELO which aim at producing professional engineer and scientist. CESP implements the curriculum structure with the application of Laboratory Based Education (LBE). This curriculum structure and the implementation of LBE are described further in section 3 and 4. In addition, CESP implement practical work and community services (KKN) to support the improvement of students' ability to work as a team with people from different disciplines.

CESP's vision is as a center of excellence in education for science-technology development of maritime infrastructure. CESP is expected to produce alumni that are able to work in the field of infrastructure design, with multi-disciplines engineers, and also as professional and responsible researcher. This can be realized through the achievement of the ELOs that has been prepared.

Table 1-2 Link between ELO and expected graduates as professional engineer

Expected Graduates as Professional Engineer	**Expected Learning Outcomes (ELO)**								
	1	2	3	4	5	6	7	8	9
Infrastructure designer	√	√	√	√					
Multi-disciplines engineer	√			√				√	
Engineering sciences researcher	√		√	√					√
Engineering risk assessor				√				√	
Ethic and professional engineering					√	√	√		
Long life learning							√		√

Both vision and mission of CESP as well as its ELOs are explicit and known to staff

and students through the following activities:

1. Workshop and curriculum dissemination,
2. Regular staff meeting every semester,
3. Socialization through media such as website, catalog, banner, information board, and
4. Academic dialogue with students every semester.

1.2. The ELO Cover Both Subject Specific and Generic

As has been explained, the expected learning outcomes of CESP academic activities cover generic skills/knowledge, specific skill/knowledge and attitude. Table 1 shows the coverage of CESP's ELO. It shows that ELO number 1, 5, 6, and 7 cover the generic skills and knowledge that must be possessed by a civil engineer so that he/she is able to implement and develop the knowledge in all construction process as well as to understand the impact of these activities. While specific skills and knowledge is covered by ELO number 2, 3, and 4 that are the special characteristic of CESP. In addition, CESP also encourage students to have ethical and moral standard when carrying them in regional, national and international society. These objectives are covered by ELO number 5, 6 and 7.

Table 1-3 The generic and specific skills covered by the ELOs and its relation with the Bloom's Educational Method

Area	Expected Learning Outcomes	Bloom's Educational Method		
		Knowledge	Skill	Attitude
Generic	An ability to apply knowledge of mathematics, science, and civil engineering.	√		√
Specific	An ability to apply the infrastructure design process which meet a well-defined set of requirements and standards.	√	√	√
Specific	An ability to apply civil engineering fundamental knowledge in overall phase of construction process (supervision, execution) and research activities.	√	√	√
Specific	An ability to identify engineering problems, formulate alternatives, and recommend feasible solutions	√	√	
Generic	An ability to play a role in a team with various disciplines.		√	√
Generic	An understanding of professional and ethical responsibility.	√		√
Generic	An ability to interact effectively both in		√	√

Area	Expected Learning Outcomes	Bloom's Educational Method		
		Knowledge	Skill	Attitude
	national and international society			
Specific	An ability to diagnose comprehensively the impact of engineering process in the context of economic, environmental, legal, and social aspects.		√	√
Specific	An ability to pursue the development of civil engineering science and technology	√	√	√

Table 1-4 Mapping between curriculum clusters and program ELOs

Curriculum Cluster	Credit	Expected Learning Outcomes (ELO)								
		1	2	3	4	5	6	7	8	9
Generic skill	50	√				√	√	√		
Specific skill	94	√	√	√	√		√		√	√

1.3. The ELOs Reflect the Requirements of the Stakeholders.

The ELOs of CESP is subject to review periodically through surveys, academic dialogues, and focus group discussions involving not only internal stakeholders i.e., staff and students but also external stakeholders such as alumni and users. CESP always pays its attention to the demand in job market and anticipates global competition in the near future. For that reason, both alumni and user were invited to participate in formulating and reviewing the ELOs of CEUH either through focus group discussion or surveys. Some inputs provided by stakeholders are accommodated by ELO of CESP. These alumni's contributions could be seen in Table 1-5.

Table 1-5 Inputs from Stakeholders in ELO

No	Stakeholder input	ELO
1	Readiness of graduates to directly working civil engineering sector	2 and 3
2	The ability of graduates in foreign languages and computer	4 and 7
3	Graduates ability to communicate and work in a team	5
4	Having courage and engineering capabilities in problem	1, 4 and 9
5	The concern of graduates to the environment	6 and 8

According to the requirement in job market and future challenges, the skills in computer applications are also required. Therefore, CESP encourages students to be able to use computer applications in problems solving, such as the utilization of civil engineering

applications (AutoCAD, SAP, Mathlab, SMS, Surfer, MS-Project, etc.). In monitoring that CESP outcomes always meet the demand of stakeholders, CESP always conduct a survey regarding the satisfactory of graduate's client. A recent survey reveals that approximately 87% of clients are satisfied with the CESP graduates. In sustaining the distribution of graduates into work field, CESP established cooperation with several employers concerning the recruitment, such as PLN (State Electricity Company) which has once entrusted part of their recruitment process to CESP. It indicates that several employers express high appreciation to the performance of CESP graduates. In addition, several CESP's cooperation with companies is formed through promotion carried out by graduates who work in these institutions. However, for a change to a better future, CESP needs more intensive input and contribution from stakeholders.

Through structured academic activities, the graduates are expected to have qualification and competency to continuously develop themselves in several alternatives. The alternatives are: developing career in civil engineering or related sector, running business as self-employed, or continuing their studies to a postgraduate level.

The ELO achievement is measured through the following tools as follows: (1) comprehensive exam by panel of examiners from various CE disciplines at the final year after students completing their final project, (2) A regular survey to alumni and users. Based on the survey result and comprehensive exam conducted during the last 3 years, the achievement of ELO can be summarized in the following table.

Table 1-6 Stakeholders' satisfaction regarding achievement of ELO by graduates

ELO	High Satisfactory	Satisfactory	Sufficient	Unsatisfactory
ELO-1		√		
ELO-2		√		
ELO-3		√		
ELO-4		√		
ELO-5			√	
ELO-6		√		
ELO-7			√	
ELO-8			√	
ELO-9		√		

2. PROGRAMME SPECIFICATIONS

2.1. The information in The Program Specification is Comprehensive and Up-to-Date

CESP reviews program specification every 5 years with the involvement of alumni, employers and stakeholders as the parties who recognize the quality of CESP graduates. CESP also constantly pay attention to labor market needs, and anticipate the future competition nationally and globally.

In order to provide information to the stakeholders, CESP prepares program specifications documents as the source of information. The program specifications can be found on the website of the university (http://unhas.ac.id/), faculty (http://eng.unhas.ac.id/), and CESP (http://eng.unhas.ac.id/sipil/). CESP also have its own profile catalog book. Besides, the program specification is also used in socialization and in establishing cooperation with other institutions. The general information stated in the program specification is as follow:

Table 2-1 Program specification of Civil Engineering Hasanuddin University

Program title	Civil Engineering Study Program
Awarding body/institution	Engineering Faculty, Hasanuddin University
Postal Address	Civil Engineering Building, Engineering Faculty, Gowa Campus Jl. Poros Malino, Km 6. Bontomarannu, Gowa
Website	http://eng.unhas.ac.id/sipil
Accreditation agency	Accredited 'A' by BAN PT (National Accreditation Board)
Final award	Bachelor Degree in Engineering (Sarjana Teknik/ST)
Learning outcomes	1. An ability to apply knowledge of mathematics, science, and civil engineering to transform concept (abstract) into reality. 2. An ability to apply the infrastructure design process which meet a well-defined set of requirements and standards. 3. An ability to implement civil engineering basic knowledge in overall phase of construction process (supervision, execution) and research activities. 4. An ability to use the techniques, skills, and modern engineering tools necessary for civil engineering practice. 5. An ability to play a role in a team with various disciplines. 6. An understanding of professional and ethical responsibility. 7. An ability to interact effectively both in national and international society.

	8. An ability to diagnose comprehensively the impact of engineering process in the context of economic, environmental and social aspects. 9. An ability to pursue the development of civil engineering science and technology.
Admission requirements to the program	All student candidates have to graduate from high school (SMU, SMK or Madrasah Aliyah) should pass the National Exam (UN), Several entry schemes are described in university website at http://www.unhas.ac.id/pmb such as: 1. SNMPTN. Special invitation for high school potential graduates which has an excellent CGP. 2. SBMPTN, National Admission Selection for Public University. Managed and registered by Ministry of Education. By way of registering on official websites and written examination. 3. POSK. Local/Hasanuddin University entrance test for those having exceptional potential in Arts, Sports and sciences. 4. PMJNS. Local/Hasanuddin University Entrance Test.
External reference points used to provide information on program outcomes	1. American Society of Civil Engineering (ASCE), 2. Consultative Board of Civil Engineering Higher Education,
Teaching, learning and assessment strategies	1. Student Centre Learning 2. Laboratory Based Education
Total of credits	144
Study duration	4 years (8 semesters)
Date on which the program specification was revised	1 September 2015

2.2. The Information in the Course Specification is Comprehensive and Up-to-Date

The mechanism of preparation course specification is carried out with reference to the Indonesian National Qualification Framework. The course specification is prepared by a group of faculty member with similar competence named “Group of Faculty member Competence” (GFC). This group receives inputs from other faculty members or stakeholders in a meeting for preparation of course specification. There are five GFCs in CESP namely (1) Geotechnical Engineering, (2) Transportation Engineering, (3) Water Resources Engineering, (4) Construction Management, and (5) Structural Engineering. The preparation of course specification is based on the objectives in CESP’s vision and mission, expected graduates, and inputs which is obtained from survey towards stakeholder. GFC evaluates and updates course specification annually regarding teaching methods and lecture notes.

Each course provides information covering course learning outcomes and syllabus

that can be easily accessed by students through Learning Management System (LMS) at http://lms.unhas.ac.id. The LMS provides course information such as:

- Course title
- Course requirements.
- Course agenda
- Expected learning outcomes
- Date on which the course specification was written or revised.
- Examination process and assessment method
- Assignment
- Online discussion
- Online documents

Nevertheless, LMS is managed by the university, when error/interruption occurs, CESP does not have a database backup.

2.3. The Program and Course Specification Are Communicated and Made Available to the Stakeholders

CESP academic staffs play important role in disseminating specification program to stakeholders and employers through CESP website. In addition, CESP conducts meeting with stakeholders and employers annually where one of the agenda is to socialize the program specification and also seek input on course specification for its development. Other activities conducted to communicate the program specification are:

- Staff participation in national and international seminars
- Becoming the organizer of the national or international seminars, or other scientific activities.
- Conducting good cooperation with other institutions, domestic or foreign.
- Student Activities.
- Road show to high schools and related institutions
- Meeting with alumni and stakeholders.
- Research expo

On the other hand, program specification is communicated to students through academic dialogue which is also conducted annually.

3. PROGRAM STRUCTURE AND CONTENT

3.1. The Curriculum is Designed Based on Constructive Alignment with the ELO

Depth of content of CESP curriculum is formulated based on Bloom's taxonomy. Minimum profundity level of courses in CESP curriculum is level 1 (remembering) and maximum is level 4 (analyzing).

The main considerations in developing CESP curriculum are Expected Learning Outcome and qualification for undergraduate education as regulated in National Qualification Framework. Based on Academic Regulation issued by Hasanuddin University, total credits for undergraduate courses are 144 credits where 24 credits are allocated for basic course. Therefore, CESP curriculum is prepared based on:

1. University curriculum for basic course (24 credits)
2. Core curriculum by The Consultative Board of Civil Engineering Higher Education (92 credits)
3. Local content which is formulated based on inputs from stakeholder and job market demand (28 credits)

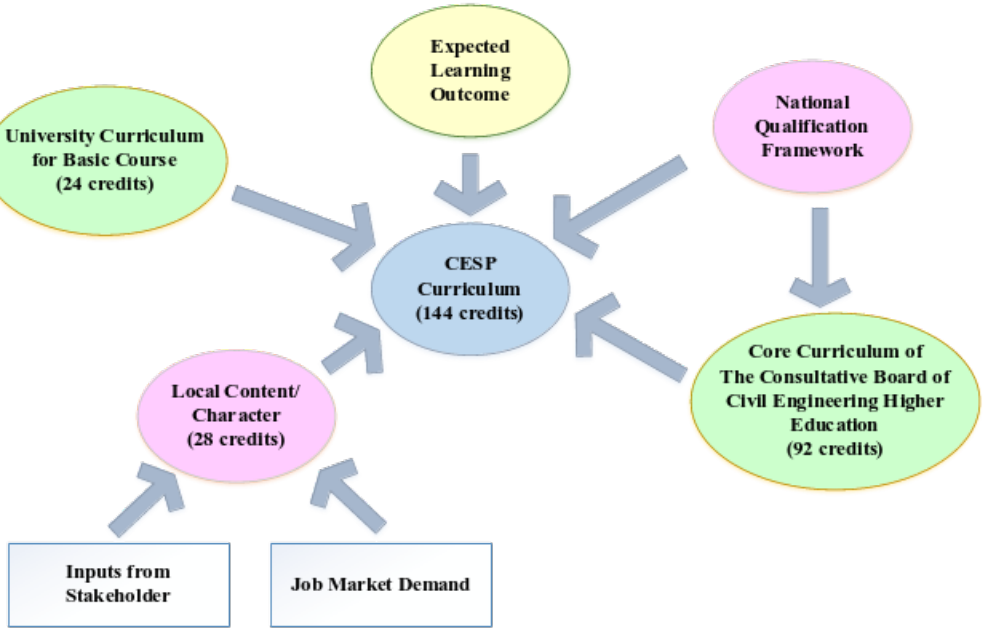

Figure 3-2 *Curriculum Formulation Approach*

The curriculum of CESP Program is integrated and coherent, which starts with: (1) General Subject, (2) Basic Subject, (3) Technical Basic Subject, and (4) Specialized Subject. This is in accordance with the LBE guideline (Exhibit 2) system applied in CESP in which the first to the third year is the consolidation of theory until practicum in basic educational laboratory, and in the fourth year is mainly based in the research laboratory for finishing final assignment. The course code numbering indicates courses coherence, wherein courses with smaller code numbers are prerequisite for other courses from the similar subject (course codes are shown in Table 3-3).

Table 3-1 Type of course in correlation to ELO

ELO	Type of Course			
	General Subject	Basic Subject	Technical Basic Subject	Specialized Subject
1		√	√	√
2		√	√	√
3			√	√
4			√	√
5	√		√	√
6	√	√	√	√
7	√		√	√
8			√	√
9			√	√

Table 3-2 Summary of course in CESP

Type of Course	Subject Category	Credit Hours	Year
General Subject	Indonesian & English Literature, Religion, Citizenship, Pancasila	14	1
Basic Subject	Math, Physic, Chemistry, Mechanical Engineering, Computer Graphic & Programming, Topographic Survey, Environmental Eng., Academic Writing, Statistic	36	1-2
Technical Basic Subject	Structure Analysis, Material Construction, Fluid Mechanics, Hydrology, Road Geometric Design, soil Mechanics, Hydraulics, Reinforced Concrete Structure, Steel Structure, Irrigation, Traffic Eng., Foundation Eng., Drainage, Road pavement, Coastal Eng., Project Management, Water Resources, Port Eng., Design of Civil Building, Prestressed Concrete.	71	2-3
Specialized Subject	Sediment Transport, Soil Dynamics, FEM, Traffic Management, Transportation Modeling, Airport Planning, River Eng., Advanced Material Technology, Earthquake Eng., Construction	12	3-4

Type of Course	Subject Category	Credit Hours	Year
	Contracts,		
Thesis & Internship	Community Service Program, Internship, Seminar, Final Project	11	4

Table 3-3 List of courses by type in the Civil Engineering Program

Type of Course	Code	Course Title	Credit Hours	Subject Category
General Subject	008U0032	Art and Technology Sciences	2	Concept of Sciences Technology and Arts
	009U0032	Indonesian Language	2	Indonesian Literature
	010U0032	English	2	English Literature
	001U0032	Islam Religion	2	Religion
	002U0032	Catholic Religion		Religion
	003U0032	Protestant Religion		Religion
	004U0032	Hindu Religion		Religion
	005U0032	Buddhist Religion		Religion
	006U0032	Khonghucu Religion		Religion
	011U0032	Citizenship Studies	2	Citizenship
	012U0032	Pancasila	2	Pancasila
	007U0022	Social Science of Maritime Culture	2	Social Science related to Maritime Culture
Basic Subject	016U0033	Basic Mathematics I	3	Aljabar, arithmetic, vector
	020U0033	Basic Physics I	3	Force, Newton Law and application, potential energy, momentum, gravitation.
	025U0032	Basic Chemistry	2	Conservation of mass, stoichiometry, ion, anion, cation.
	022U0033	Basic Physics II	3	Electromagnetism, Gauss's Law, Electric potential.
	017U0033	Basic Mathematics II	3	Differential, Integral.
	101D1113	Computer Graphics for Civil Construction	3	Engineering drawing and computer aided drafting.
	102D1112	Computer Programming	2	Introduction of Fortran/ Visual basic for Engineering
	103D1113	Statics	3	Axial Force, moment, shear force, etc.
	104D1122	Topographic Survey & Mapping	2	Application of Theodolite, Waterpass and Total Station
	105D1123	Material Mechanics	3	Moment Inertia, static moment, stress and strain
	106D1122	Principles of Environmental Engineering	2	Basic environmental science
	207D1112	Research Methodology & Academic Writing	2	Academic writing and research methodology
	208D1112	Engineering Mathematics I	2	Fourier series, Laplace transformation
	213D1112	Statistics & Probability	2	Probability, statistic descriptive, normal distribution.
	218D1122	Engineering Mathematics II	2	Matrix equation, Eigen value
Technical Basic	209D1113	Construction Material Technology	3	Concrete Materials and asphalt materials

Type of Course	Code	Course Title	Credit Hours	Subject Category
Subject	210D1112	Introduction of Engineering Geology & Soil Mechanics I	2	Soil classification, soil stress, bearing capacity, effective pressure.
	211D1112	Fluid Mechanics	2	Fluid characteristic, fluid flow
	212D1112	Hydrology Engineering	2	Hydrological cycle, Infiltration and Percolation, groundwater, erosion and sediment
	214D1113	Structure Analysis I	3	statically indeterminate structure, Consistent deformation, Moment distribution, etc.
	215D1113	Road Geometric Design	3	Cross section of road, standard design, alignment vertical and alignment horizontal.
	216D1122	Soil Mechanics II	2	Compaction., shear stress, lateral pressure, Consolidation, settlement
	217D1122	Hydraulics	2	Characteristic of liquid, flow in pipes, open channel flow, steady uniform flow.
	219D1122	Structure Analysis II	2	Statically indeterminate structure: stiffness method, flexibility method
	220D1122	Reinforced Concrete Structure I	2	Concept design, beam with single reinforced and double reinforced, shear reinforced, column design.
	221D1122	Steel Structure I	2	Tensile and tension dimension, welded joint, bolted connection
	222D1123	Irrigation & Water Structure	3	Design of drainage dimensions and other irrigation structures
	223D1122	Traffic Engineering	2	Parameter Traffic Flow, Analysis Method intersection
	224D1122	Project Management	2	Project management body of knowledge, time and cost management.
	325D1112	Foundation Engineering I	2	Shallow foundation, bearing capacity and settlement
	326D1112	Applied Mathematics	2	Mathematical applications in civil engineering
	327D1112	Numerical Analysis	2	Regression, curt fitting, linier equation, ordinary and partial differential equation
	328D1112	Reinforced Concrete Structure II	2	Design plate, console beam, earthquake load, foundation design.
	329D1112	Steel Structure II	2	Roof truss design, simple frame design, girder plate
	330D1112	Drainage Engineering	2	Drainage design and other structure
	331D1113	Road Pavement Design	3	Flexural and rigid pavement design.
	332D1112	Coastal Engineering	2	Wave, wave deformation, statistic and wave forecasting, coastal building

Type of Course	Code	Course Title	Credit Hours	Subject Category
	333D1112	Mechanism Soil Transfer / Heavy Equipments	2	The capacity of heavy equipment, maintenance and operational cost.
	334D1112	Project Planning & Control	2	Project scheduling, cost planning, earned value.
	335D1122	Water Resources Development	2	Hydro power, water transportation.
	336D1122	Entrepreneurship on Civil Engineering	2	Engineering economic, business in construction field.
	337D1122	Prestressed Concrete Structures	2	Concept of prestressed, loss of prestressed.
	338D1122	Foundation Engineering II	2	Pile design, sheet pile and retaining wall design.
	339D1122	Construction & Demolition Method of Construction	2	Construction method, repair and strengthening structure
	340D1123	Design of Integrated Civil Building	3	Building/bridge integrated design
	341D1122	Professional Ethics & Legal Aspects of Construction	2	Code of ethics, professionalism, Legal Aspects of Construction
	342D1122	Port Engineering	2	Port Design and accessories
Specialized Subject	444D1133	Water Structure Planning	3	Design for water structure: dam, water treatment, water distribution.
	445D1133	Reclamation & Dredging Engineering	3	Reclamation dredging law, systematic method of reclamation, volume of dredging and reclamation
	446D1133	Sediment Transport & Erosion	3	Suspended load and bed load forecasting with various methods.
	447D1133	Hydropower Structure	3	Hydropower potential, design hydropower and facilities.
	448D1133	Irrigation & Swamp Engineering	3	Operation and maintenance irrigation infrastructure
	449D1133	River Engineering	3	Reconstruction of river morphology identifies river potential, utilization, control the destructive and preservation of the river analysis.
	450D1133	Soil Improvement/Reinforcement Method	3	Mechanics and hydraulic improvement method, and additive.
	451D1133	Soil Dynamics	3	Machine foundation, liquefaction.
	452D1133	Principal of Geotechnical Environmental	3	Clay liner for landfill, groundwater contamination.
	453D1133	Finite Element Method for Geotechnical.	3	Elements/discrete (truss, beam, plane), stress-strain elements.
	454D1133	Advance of Foundation Engineering	3	Elastic foundation and case study.
	455D1133	Principal of Geotechnical Disaster	3	Land slide, land subsidence, seepage.
	456D1133	Multi-Moda Transportation Planning	3	Moda characteristic, transport network connection
	457D1133	Construction Method and	3	Road improvement method,

Type of Course	Code	Course Title	Credit Hours	Subject Category
		Finance of Road		analysis of financing road repairs
	458D1133	Railway Planning	3	Planning Wessel road train, planning train geometric.
	459D1133	Transportation Modeling	3	Analysis of trip generation and Trip distribution
	460D1133	Traffic Management	3	Traffic management, traffic regulation.
	461D1133	Airport Planning	3	Site selection, plane characteristic, planning of airport land side
	462D1133	Design and Construction Method of Bridge	3	Step by step construction method, element bridge design.
	463D1133	Earthquake Engineering of Structures	3	Static and dynamic loads, dynamic characteristic, free vibrations, forced vibration, and response structure
	464D1133	Strengthening Method of Constructions	3	Types of structural retrofitting/strengthening method
	465D1133	Advanced Material Technology	3	Mechanical properties of concrete, Concrete durability, construction and maintenance
	466D1133	Finite Element Method for Structure	3	Elements/discrete (truss, beam, plane), stress-strain elements.
	467D1133	Introduction of Forensic Engineering of Structures	3	Destructive and non-destructive test, modeling and analysis, recommendation.
	468D1133	Sustainability Construction Management	3	Sustainable building, advanced construction management, based practices construction
	469D1133	Construction Science Management	3	Decision making tools, analytical method.
	470D1133	Construction Company Management	3	Human resources, organization and business approach for construction
	471D1133	Management System of Work Healthy and Safety	3	Risk management, Health standard in construction
	472D1133	Construction Quality Management	3	Quality tools, quality management system.
	473D1133	Construction Contracts	3	Process and requirement for contract, types of contract, and international contract.
Thesis & Internship	343D1134	Community Service Program	4	Community Service Program in specific area
	474D1132	Internship	2	Field work and civil work Application
	475D1131	Seminar	1	Presentation on final project progress
	476D1134	Final Project	4	Experimental study/ design related on final project title

3.2. The Contribution Made by Each Course to Achieve the ELO is clear

The contribution of each course to achieve ELO is clearly expressed the general and specific instructional aim of the lecture as stated in each course syllabus. Table 3-4 shows the percentage of subjects corresponding to ELO. From this table it can be seen that the contribution of ELO against subjects tend to be balanced for each ELO around 15% except ELO 5, 6 and 7. This is because ELO 1, 2, 3, 4, 8 and 9 are the core of the ELO PS TS and relates directly to the civil engineering field. For example, percentage for ELO-1 is obtained from the number of courses related to ELO-1 divided by the total number of courses. Nevertheless, Design of Integrated Civil Building course have not been implemented in accordance with the expected goals.

Table 3-4 Number of course contribute to ELO

ELO	1	2	3	4	5	6	7	8	9
Number of course contribute to ELO	12	10	10	3	5	2	8	8	4
Percentage	19.4 %	16.1 %	16.1 %	4.8%	8.0%	3.2%	12.9 %	12.9 %	6.4%

Table 3-5 Contribution of Course to Achieve the ELO

Type of Course	Course Title	Credit Hour	ELO 1	ELO 2	ELO 3	ELO 4	ELO 5	ELO 6	ELO 7	ELO 8	ELO 9
General Subject	Art and Technology Sciences	2	I								
	Indonesian Language	2	I					I			
	English	2	I					I	I	I	
	Religion	2	I			I	I				
	Citizenship Studies	2	I								
	Pancasila	2									
	Social Science of Maritime Culture	2	I	I	I						
Basic Subject	Basic Mathematics I	3	I	I	I						
	Basic Physics I	3	I	I	I						
	Basic Chemistry	2	I	I	I						
	Basic Physics II	3	I	I	I						
	Basic Mathematics II	3	I	I	I						
	Computer Graphics for Civil Construction	3	I	R	M				I		
	Computer Programming	2	I	R	M				I		
	Statics	3	I	R	R				I		

Type of Course	Course Title	Credit Hour	ELO 1	ELO 2	ELO 3	ELO 4	ELO 5	ELO 6	ELO 7	ELO 8	ELO 9
	Topographic Survey & Mapping	2	I	R	R	R	R		I		
	Material Mechanics	3	I	I	R				R		
	Principles of Environmental Engineering	2	I	I	R				R		
	Research Methodology & Academic Writing	2	R								
	Engineering Mathematics I	2	I	I	R						
	Statistics & Probability	2	I	R	R						
	Engineering Mathematics II	2	R	R	R						
Technical Basic Subject	Construction Material Technology	3	I	R	R						
	Introduction of Engineering Geology & Soil Mechanics I	2	R	M	M		R		R	R	
	Fluid Mechanics	2	I	R	M		R		R	R	
	Hydrology Engineering	2	I	R	M		R		R	R	
	Structure Analysis I	3	I	R	M				R	R	
	Road Geometric Design	3	I	R	M		R		R	R	
	Soil Mechanics II	2	R	R	M		R		R	R	
	Hydraulics	2	I	R	M		R		R	R	
	Structure Analysis II	2	R	R	M				R	R	
	Reinforced Concrete Structure I	2	R	M	M		R		R	M	
	Steel Structure I	2	R	M	M		R		R	M	
	Irrigation & Water Structure	3	R	M	M		R		R	M	
	Traffic Engineering	2	R	M	M		R		R	M	
	Project Management	2	R	R	M	R	R		R	R	
	Foundation Engineering I	2	R	M	M		R		R	M	
	Applied Mathematics	2	R	R	R						
	Numerical Analysis	2	R	M	M						
	Reinforced Concrete Structure II	2	R	M	M		R		R	M	
	Steel Structure II	2	R	M	M		R		R	M	
	Drainage Engineering	2	R	M	M		R		R	M	

Type of Course	Course Title	Credit Hour	ELO 1	ELO 2	ELO 3	ELO 4	ELO 5	ELO 6	ELO 7	ELO 8	ELO 9
	Road Pavement Design	3	R	M	M		R		R	M	
	Coastal Engineering	2	I	R	R				R	R	M
	Mechanism Soil Transfer / Heavy Equipments	2	R	R	R		R		R	R	
	Project Planning & Control	2	R	R	M		R		R	R	
	Water Resources Development	2	R	R	R		R		R	R	
	Entrepreneurship on Civil Engineering	2				M	M				
	Prestressed Concrete Structures	2	R	M	M		R		R	M	
	Foundation Engineering II	2									
	Construction & Demolition Method of Construction	2	M	M	M	M	M	R	M	M	
	Design of Integrated Civil Building	3	M	M	M	M	M	R	M	M	
	Professional Ethics & Legal Aspects of Construction	2	R	R	R	R	R	R	R	R	
	Port Engineering	2	R	M	M		R		R	R	
Specialized Subject	Water Structure	3	I	R	R	R	R		R	R	M
	Reclamation & Dredging Engineering	3	I	R	R		R		R	R	M
	Sediment Transport & Erosion	3	I	R	R				R	R	M
	Hydropower Structure	3	I	R	R				R	R	M
	Irrigation & Swamp Engineering	3									
	River Engineering	3									
	Soil Improvement/Reinforcement Method	3	I	R	R		R		R	R	M
	Soil Dynamics	3	I	R	R				R	R	M
	Principal of Geotechnical Environmental	3									
	Finite Element Method for Geotechnics	3	I	R	R				R	R	M

Type of Course	Course Title	Credit Hour	ELO 1	ELO 2	ELO 3	ELO 4	ELO 5	ELO 6	ELO 7	ELO 8	ELO 9
	Advance of Foundation Engineering	3	I	R	R				R	R	M
	Principal of Geotechnical Disaster	3									
	Multi-Modal Transportation Planning	3	I	R	R				R	R	M
	Construction Method and Finance of Road	3	I	R	R				R	R	M
	Railway Planning	3	I	R	R				R	R	M
	Transportation Modeling	3	I	R	R				R	R	M
	Traffic Management	3	I	R	R				R	R	M
	Airport Planning	3	I	R	R		R		R	R	M
	Design and Construction Method of Bridge	3	I	R	R		R		R	R	M
	Earthquake Engineering of Structures	3	I	R	R				R	R	M
	Strengthening Method of Constructions	3									
	Advanced Material Technology	3	I	R	R				R	R	M
	Finite Element Method for Structure	3	I	R	R				R	R	M
	Introduction of Forensic Engineering of Structures	3									
	Sustainability Construction Management	3									
	Construction Science Management	3	I	R	R				R	R	M
	Construction Company Management	3	I	R	R				R	R	M
	Management System of Work Healthy and Safety	3									
	Construction Quality Management	3	I	R	R		R		R	R	M
	Construction	3									

Type of Course	Course Title	Credit Hour	ELO 1	ELO 2	ELO 3	ELO 4	ELO 5	ELO 6	ELO 7	ELO 8	ELO 9
	Contracts										
Thesis & Internship	Community Service Program	4				R					
	Internship	2									
	Seminar	1			I						
	Final Project	4			M						

I = Introducing, R = Reinforcing, M = Mastering

3.3. The Curriculum is logically structured Sequenced, Integrated and Up-to-Date

CESP study program is organized into Common Preparatory Year courses, Compulsory courses and Elective courses. Elective course is provided in 7th and 8th semester for students in their final year who have set the topic of the final project. It is intended that the elective courses to play a role in accommodating various talent and interest of students in pursuing an area of specialization in civil engineering professions.

Several courses act as prerequisite course which can be enrolled if students have pass certain courses. For instance, students are able to enroll Reinforce Concrete Structure I if the have passed course of Statics and Material Mechanics. Academic information system which is managed by the university and faculty has not accommodated prerequisite courses.

CESP constantly updates the curriculum based on the needs of stakeholders, the user of graduates, or the changes in legislations and regulations. In making these changes, CESP involves the entire academic community of both PS and the university, and also invites stakeholders and users of graduates to give feedback and suggestions. Results of the gathering of feedbacks, suggestions are accommodated in the changes of curriculum.

The curriculum of CESP study program was revised and updated in 2015, and put into effect in academic year 2016/2017. Minor changes have been made on course content level every year, whereas more comprehensive changes will be conducted in 2016-2020. The revision was made to align with Indonesian National Qualification Framework (INQF). The Framework requires undergraduate program to reach Level 6 qualifications. A comprehensive change in CESP curriculum has only been made once since CESP Program with its system of compulsory and elective was applied.

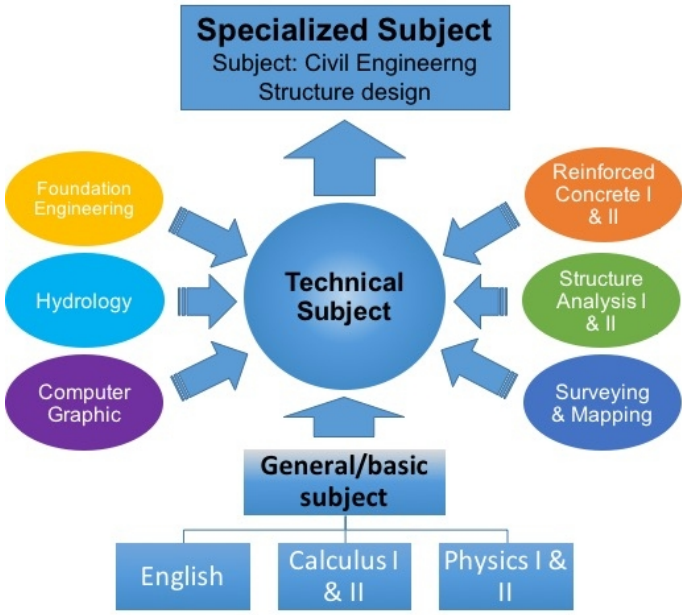

Figure 3-3 The relationship between basic and specialized courses

4. TEACHING AND LEARNING STRATEGY

4.1. The Educational Philosophy is Well Articulated and Communicated to All Stakeholders

The basic concept of educational philosophy of CEUH is to create and develop an environment conducive to the process of learning by challenging students to problem-solving and through hands-on experiences. CEUH considers the combination of SCL and LBE as the optimum concept. This concept is reinforced by the support of JICA in terms of technical aid for the development of Engineering Faculty of Hasanuddin University. CEUH believes that this approach will effectively promote active learning, effective decision making through critical thinking, and when working in small groups can further develop students' cooperative skills. There are a number of opportunities to enhance the laboratory environment by integrating theory with practice, by blending other active learning strategies such as web or computer based learning, and introducing problem based learning (PBL). PBL and LBE will provide enhanced higher level reasoning skills.

Laboratory Based Education (LBE) is an educational method that foster learning through research works based in laboratory. Therefore LBE also could be synonymous with research based education and/or problem based learning. LBE should be defined as "Research structure consisting of faculty members, undergraduate and graduate students, and facilities targeting specified education subject and research topics".

LBE is expected to bring the CESP positive impacts as follows;

1. To improve the quality and relevance of engineering education
2. To increase CESP members involvement in research
3. To increase students involvement in laboratory
4. To enhance 'student-centered learning' process
5. To increase interaction between CESP members and students

By the LBE system, CESP study program has been able to stimulate students, faculty members, and laboratory staff to further improve the quality of their research. This is supported by the quality of the equipment available in the CESP. Knowledge of theory, basic laboratory obtained in 6 (six) the previous semester, and practical work could be used by students as a foundation for subsequent semesters.

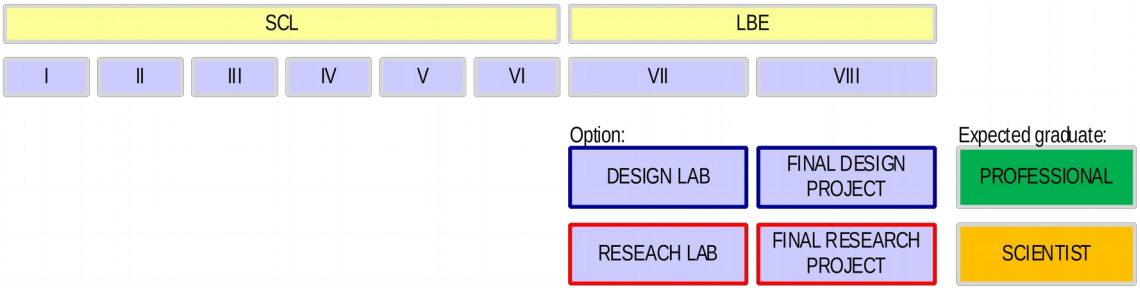

Figure 4-4 *Curriculum Structure with SCL-LBE Implementation*

4.2. Teaching and Learning Activities Are Constructively Aligned To the Achievement of the Expected Learning Outcomes

In an LBE environment, students of CESP will mostly undertake practical works throughout their study which develops experimental and design skills, data collection and analytical capabilities, problem solving skills and professional practices (Figure 4-1). At the final year, students have to perform research at the laboratory for their final project in which undergraduate students will be working together with master and doctoral students with the same research topics under the supervision of professor. A doctoral student is usually appointed as a team leader to supervise the experiment conducted by undergraduate students; however, the responsibility is still under the supervisor (professor).

Variation of laboratory model is possible considering adoption/adaptation of or combination with other models such as Problem-Based Learning (PBL) and / or Case-Based Learning (CBL), however it should be within the same core model. In addition, there is still a faculty member who only implement TCL (Teaching Centre Learning) method.

In LBE system, senior students assist junior students as a mentor. PhD students assist master students; and subsequently master students assist undergraduate students. Students work as a team (Team Work). Every two weeks the students present their research progress in front of laboratory members (Figure 4.2)

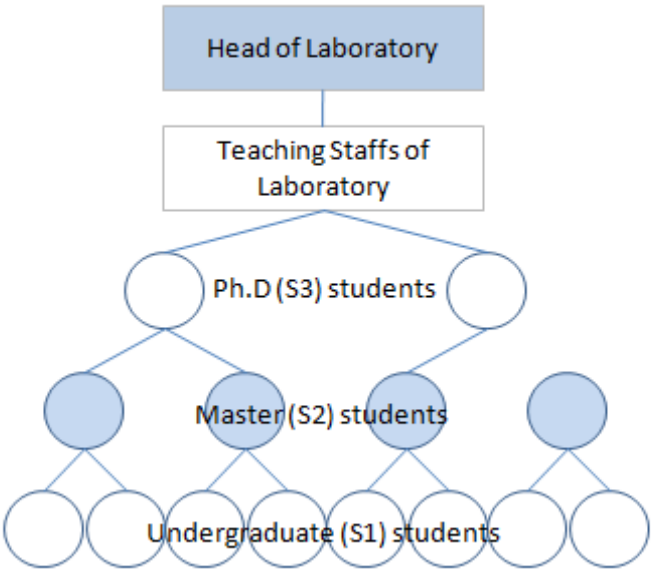

Figure 4-5 Laboratory Members Hierarchy

The following table explains the hierarchy of learning activities in CESP. In semester 1 to 4, students are equipped with the basic knowledge through basic courses which accommodate ELO 1 and 8. On the 5th and 6th semesters, student's knowledge is reinforced with intermediate courses to fulfill ELO 2, 3, 4, and 9.

Table 4-1 Teaching and Learning Approach to Achieve the ELO

Courses	Semester	Types of Teaching and Learning	Approach	ELO
Basic	1 - 4	SCL	Teaching	1, 8
Intermediate	5 - 6	SCL	Learning	2, 3, 4, 9
Specialized	7 - 8	LBE	Experience	5, 6, 7

In order to use of teaching and learning technology to accelerate and motivate student learning capacity, the CESP utilizes LMS (Learning Management System) to deliver educational courses, training program, documentation, reporting, and for administration. The LMS has several benefits, which are:

1. Centralized Learning
2. Highly flexible and Customizable
3. Easily Create Courses
4. Anytime Access to Content and Discussion
5. Immediate Evaluation

6. Tracking and Reporting for Enhanced Performance

Classes/courses are scheduled from semester 1 to semester 6. Understanding on the subject learned from the previous or during the semester will be strengthened by laboratory practicum. In semester 7 each laboratory should have research topics in the form of Research Road Map. The topics better be closely related to the current research work / grant of the faculty members. The main feature on implementing LBE is the arrangement of regular research activities including research consultation, weekly presentation and preparation for the thesis presentation.

To improve students' ability in understanding of the course and achieve the goal of ELO, CESP strategizes a structured learning and intertwined courses from one semester to the next. For example of specialized subjects is Integrated Design of Civil Structure. The main purpose of this course is that the students are able to design a full infrastructure. To achieve this goal students have to pass some required courses from the previous semester, i.e. from general and intermediate subjects. Example of task in the course is student has to finish a complete design of a building, or prepare a complete plan on how to manage a construction of a bridge.

Implementation of the learning process based on E-learning is also developed by HU, including CESP. In CESP, E-learning is implemented to provide information on course syllabus, teaching materials, and other information, as well as to provide a mean to accommodate discussion between students and faculty member. Access to upload and download materials is enabled through Learning Management System (LMS) which is managed by a unit of E-Learning Development Program of HU. The LMS can be accessed through university website at http://lms.unhas.ac.id/

4.3. Teaching and Learning Activities Enhance life-long-learning

Basically, people need to be accustomed to lifetime learning in order to improve their knowledge, skill and competence to meet the demand and development of science and technology. To achieve this goal, CESP directs its students to develop themselves both during study time and after completing their studies. CESP aims to produce graduates who are able to develop themselves and to pursue the development of science and technology through structured academic and extracurricular activities. Considering the competition in

job market and future challenges, the computer applications skills are also required. Therefore, CESP also encourages students to be able to use computer applications in problems solving, such as the utilization of civil engineering applications (AutoCad, SAP, Mathlab, SMS, Surfer, MS-Project, etc.). Besides, transformation in learning strategies has been implemented by CESP from Teaching Center Learning (TCL) to the Student Center Learning (SCL) system. This transformation encourages students to constantly try to learn independently. In addition, extracurricular activities could develop the organizational attitude, leadership, social sensitivity, ethics and passion toward competition.

CESP also encourage the students to be able to interact effectively both in national and international society. To support this, CESP implement learning activity in English on several subjects where lectures deliver subject in English, assignment in English, or presentation in English. Through this structured academic activities, the graduates are expected to have qualification and competency to continue to develop themselves in several avenues, such as: developing career in civil engineering or related sector, running business as self-employed, or continue their studies to postgraduate level.

5. STUDENT ASSESSMENT

5.1. The student assessment is constructively aligned to the achievement of the expected learning outcomes

Assessment of students is conducted in student admissions, during academic year, and at final year. Student admission is carried out by Hasanuddin University for entire faculty. Prospective students are assessed in a test for academic potential. Test for prospective students in science studies consist of math and physics as basic capabilities for civil engineering field (ELO 1). Student admission is carried out in several methods as described as follows:

1. SNMPTN, a special invitation for high school potential graduates which has an excellent academic performance.
2. SBMPTN, National Admission Selection for Public University. Managed and registered by Ministry of Education. It is conducted by registering on official websites and then followed by written examination.
3. POSK, Local/Hasanuddin University entrance test for those having exceptional potential in Arts, Sports and sciences.
4. PMJNS, Local/Hasanuddin University Entrance Test.

Table 5.1 shows the student who passed and failed in the assessment at the entrances exams.

Table 5-1 Passed and Failed ratio of the entrances exams

No	Scheme of the entrance	2011		2012		2013		2014		2015	
		Candidate	Pass	Candidate.	Pass	Candidate	Pass	Candidate	Pass	Candidate	Pass
1	SNMPTN	483	12	491	13	1669	54	1896	45	2103	45
2	SBMPTN	1106	55	1560	54	1802	39	2200	33	2318	31
3	POSK	13	4	23	5	-	4	24	3	18	2
4	PMJNS	77	51	61	52	-	46	365	31	415	36

Student assessment during semester is conducted in various ways. The assessment such as examination in the middle and at the end of semester is carried out to measure students' understanding of the subjects, capability to identify problems and obtain solutions, and communication skill. The assignment given throughout semester, in

integrated civil structure design subject, is intended to evaluate the students' ability to design civil infrastructure in accordance with the standardization. Students also are assessed during laboratory task to measure their capability to apply theory into practice, to maintain ethical standard, and to work as a team.

In the 7th and 8th semester, students carried out internship, community service program, and final project. The assessments of these subjects are intended to measure students' competency in accordance to entire ELOs. To accomplish the degree program, students must complete their thesis and present it on a seminar (Table 5-2).

In addition, to assess the suitability of students to continue their studies, CESP conducts evaluation in the 4th semester based on their GPA (minimum 2.0) and the amount of cumulative credits which has been fulfilled (minimum 48 credits). Students who are unable to pass the evaluation will be dropped-out. Also, students who are unable to finish their studies below 14 semesters will also be dropped-out.

Table 5-2 Correlation between Assessment Method and ELO

No	Assessment Method	Description	ELO
1	Lectures 1. Written test 2. Problem solving task 3. Presentation	Measuring students' understanding of the subjects, capability of problem solving, and communication skill	1, 3, 6
2	Laboratory	Measure students' capability to using laboratory equipment, data analysis, dan capability in working as team	1, 3, 9
3	Design of integrated civil building	Provide enhancement of students' skill regarding design of civil infrastructure	1, 2, 3, 4, 8, 9
4	Internship	Measure students' understanding regarding implementation of theory in construction field.	3, 4, 5, 6, 7, 8, 9
5	Community service program	Improve students' social awareness and social responsibility	4, 5, 6, 7, 8
6	Final project/thesis	Enhance students capability regarding implementation of science and technology based on their competency	1, 2, 3, 4, 8, 9

5.2. The student assessments including timelines, methods, regulations, weight distribution, rubrics and grading are explicit and communicated to students

CESP utilizes the assessment criteria as stipulated in the university's Academic Regulation. These criteria are well known to students, since they are described in the courses' syllabi and discussed with the students prior to the lecture commences. The assessment criteria include: a minimum of 80% class attendance, student's activity in the classroom, assignments, mid and end semester examination. The assessment results are classified with letters as shown in Table 5-3.

Table 5-3 Grade of assessment

Scale	Score
A	>85
A–	81 – 85
B+	76 – 80
B	71 – 75
B–	66 – 70
C+	61 – 65
C	51 – 60
D	45 – 59
E	<45

5.3. Methods including assessment rubrics and marking schemes are used to ensure validity, reliability and fairness of student assessment

Currently the marking scheme has not been widely used in the assessment since this method is still relatively new method for CESP. However, some faculty members who have completed learning training in the last 2 years have implemented this scheme as recommended in the training. Nevertheless, in the future, CESP will gradually promote this assessment method to ensure the validity, reliability and fairness of student assessment.

5.4. Feedback of student assessment is timely and helps to improve learning

Feedback regarding assignments is conducted during lecture in class. Graded homework is returned to students in following lecture or at the earliest possible opportunity. For exam result, mostly feedback is carried out immediately after the examination (mid/final test) has been completed by informing the exam results to the student and explaining the correct answer. For the student who got a low grade, an

opportunity is given to take a remedial. Nevertheless, feedback of student assessment is mostly no documented.

5.5. Students have ready access to appeal procedure

Student are given an opportunity to appeal if he/she is not satisfied with the assessment of examination within a period of two weeks after the assessment results were announced in the academic information system (http://portal-akademik.unhas.ac.id/). Student lodge complain directly to the faculty members. If there is a revision, the faculty member fills in the form which should be approved by Head of Department and Vice Dean for Academic Affairs. The following diagram shows the appeal procedure in CESP.

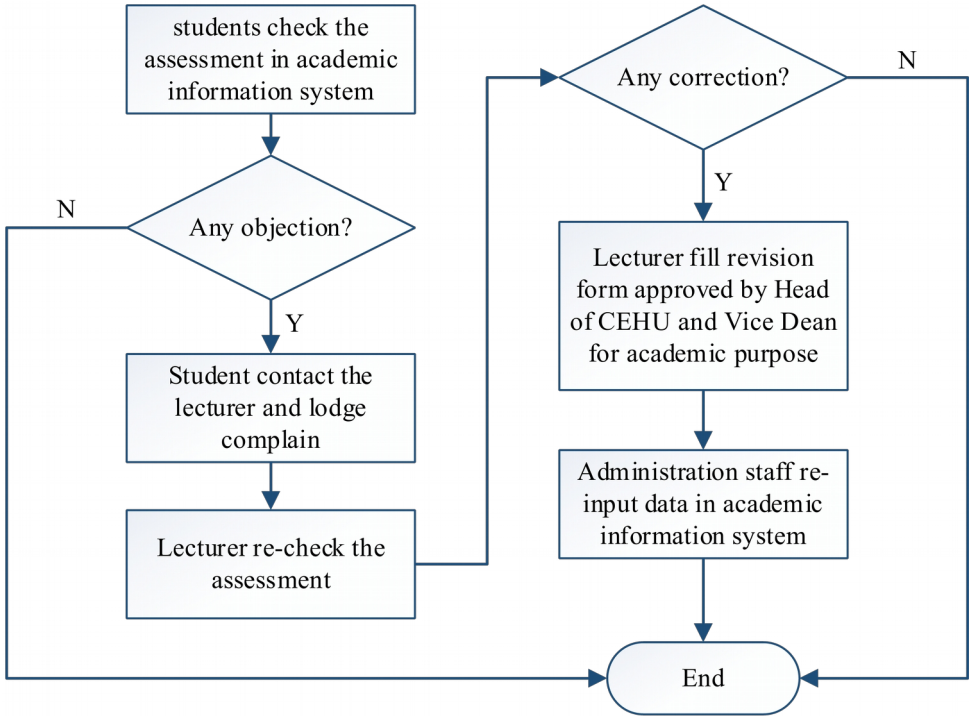

Figure 5-6 *Appeal procedure*

6. ACADEMIC STAFF QUALITY

6.1. Academic staff planning (considering succession, promotion, re-deployment, termination, and retirement) is carried out to fulfill the needs for education, research and service

Staff development planning is begun by selections conducted by study program and by preparing top graduates proposed by research groups or subdivisions in civil engineering. The graduates are appointed first to assistantship and then offered scholarship to further their education to a master level. Teaching assistant who has fulfilled certain qualifications then proposed to join a recruitment to be accepted as civil servant candidate.

Academic staff recruitment is centralized at the Hasanuddin University which receives quota for new staffs/candidates from Ministry of National Education (currently the Ministry of Research Technology and Higher Education). Recruitment process of academic staff and supporting staff in civil engineering study program is based on principles of competitiveness, fairness, objectivity, transparency, and free from corruption, collusion, and nepotism, which is in line with circular letter issued by Ministry of Empowerment of National Apparatus and Bureaucracy Reform No B/2215/M.PAN-RB/7/2013 regarding staffing system reform for civil servant candidates. In General academic staff candidates are required to have minimum of a master degree. In 2014 one person accepted as candidate for academic staff with a PhD degree. The purposes of recruitment are not only for replacement for staff that nearly retired or quit for other reasons, but also for development and betterment of the quality as a whole. Every faculty (school) has quota given by the University for Additional staffing based on the proposal on the staffing need in the study program. After approved in the CESP staff meeting, this proposal is submitted to the Dean office and then forwarded to the university.

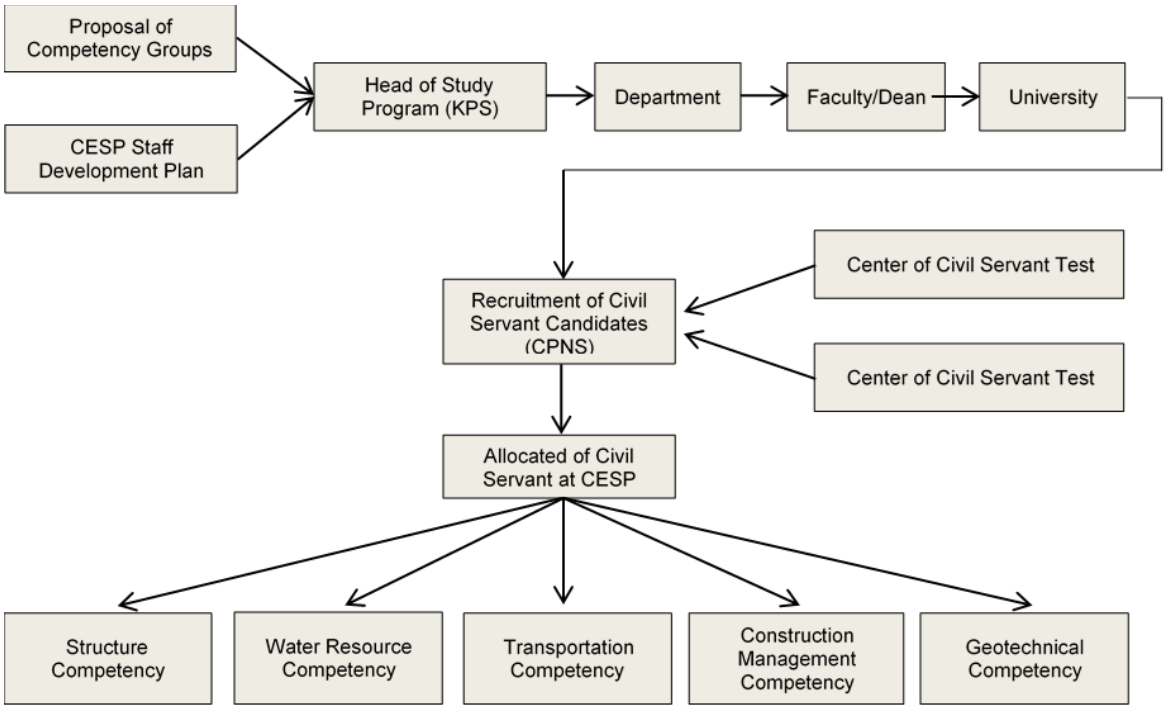

***Figure 6-7** Procedure for recruiting academic staff*

6.2. Staff-to-student ratio and workload are measured and monitored to improve the quality of education, research and service

CESP every year monitors the ratio between academic staffs to the number of students and compares it to the ideal number determined by directorate general of higher education (Ministry regulation, Permenristekdikti no 44 Year 2015) which is 1:20. The tasks/burden of academic staff is determined based on ideal average load of 12-14 credit hours. In improving the quality of education and the services to students, the ratio of staff to student is considered in recruitment of academic staff and student acceptance. Table 6.1 describes the ratios of staff to students for the last five years.

Table 6-1 Staff/student ratio and staff/graduate ratio

Items	2011	2012	2013	2014	2015
Number of staff	56	52	50	48	45
Number of student	656	653	652	616	579
Ratio	1:12	1:13	1:13	1:13	1:12

Table 6-2 Number of staff and the adequacy of staff competence

CATEGORY	M	F	Average of FTEs	Percentage of

			Headcounts	Total	PhDs (%)
Professor	5	0	5	1.1	100
Associate/Assistant Professor	28	6	34	1.08	70.59
Full time Faculty member	5	1	6	1.06	0
Part time Faculty member	0	0	0	0	0

The following table shows the ratio 1 FTE academic staff member employed to the number of FTE students enrolled. The aim is to give an idea of how much contact time and academic support students at the institution may expect to receive.

Table 6-3 FTEs of academic

Academic Year	Average FTEs of academic staff	Average FTEs of students	Staff to student ratio
2011	1.06	1	1.06
2012	1.08	1	1.08
2013	1.06	1	1.06
2014	1.09	1	1.09
2015	1.07	1	1.07

Research result is an important output from academic staff. The types of research activities (such as publications, consulting work, projects, grants, etc.) of CESP can be seen on Table 6-4. Even so, there are faculty member who have not been actively involved in research.

Table 6-4 Types and Number of Publication

Academic Year	Types of Publication			Total	No. of Publication/ Academic staff
	In-house/ institutional	National	International		
2015	15	15	46	76	1.69
2014	12	6	32	50	1.04
2013	10	11	56	77	1.54
2012	11	8	34	53	1.02
2011	8	9	35	52	0.93

6.3. Recruitment and selection criteria including ethics and academic freedom for appointment, deployment and promotion are determined and communicated

Academic staff must possess the best competencies in order to provide the best education for students. The recruitment process of academic staffs at CESP, Hasanuddin University, refer and follow the process that is regulated by the Ministry of Higher Education Republic of Indonesia which is implemented at the University level. The study program, in this case, contribute in providing information needs of academic staff level including the number and qualifications of staffs required. Announcement about staff recruitment is done openly through the media such as newspapers, radio and television as well as the website of the university and faculty. As one of the best Civil Engineering program in Indonesia, there is no difficulty in filling vacancies to become a faculty member.

The selection process is performed in several steps as follows:

6.3.1. Administrative selection

In this process, applicants submit application forms addressed to the selection committee at the university level by attaching several required documents that predetermined by the Faculty and the University such as level of education, skills and other qualifications required by the Faculty proposing the formation of the academic staffs.

6.3.2. Written Test

Participants who have passed the selection and administration process, will proceed to the written test conducted by the University. All participants with their various back ground follow the written test carried out simultaneously. The test includes basic competency tests, tests of academic potential and a test of English language proficiency.

6.3.3. Interview

Participants who have passed the written test then they should attend the interview which is conducted by the Dean and the Head of Department. This interview is intended to look at the motivation and self-development plan if the applicant is accepted as academic staff.

6.3.4. Micro teaching

As the end of the entire recruitment process, applicants are required to demonstrate their teaching skills through micro teaching, which is attended by the proposing department and dean staff.

Scores obtained in the written test, interview and micro teaching will be used to determine the rank of the applicants and will then be proposed by the study program to the university level before being sent to the Ministry of Higher Education Affairs for final decision. The good and transparent selection process is expected to yield academic staffs that have basic competence and good teaching skills as well as having the potential for further development.

6.3.5. Promotion

Academic staff is promoted in different forms such as promotion to a higher structural position at the faculty level and at university level for example, as Head of the Department, Dean or even Rector. In addition to structural position, the teaching staff can also be promoted to lead non-structural units.

The performance assessment is carried out at departments' level. At this system, the staff will be assessed by the direct supervisor in this case the Head of Department. The assessment result is then forwarded to the Dean office. The academic staff is also promoted by fulfilling of the cumulative credit scores above *Tri Dharma* (Three tasks) activities that they have been done. *Tri dharma* activities include teaching, research, community service and other support activities. Performance of academic staff is done by applying peer review.

Since 2014, the performance of teaching staff is done under government regulation (PP) no. 46 on performance appraisal of civil servants to assess the results of the work achieved by any civil servants against the target performance. In the new system, the faculty judgment will be based on work plans and targets (workload) to be achieved by the teaching staff annually, and additionally be based on behavior, attitude, and action taken or not performed by the academic staff, in accordance with the provisions of existing law.

6.4. The selection process is done in several steps as follows: Competences of academic staff are identified and evaluated

In order to asses and evaluate the competency of academic staffs, the university established a quality assurance unit in the study program level. At the university level, the quality assurance unit is called Internal Quality Assurance Unit (Satuan Penjaminan Mutu Internal, SPMI). The task of SPMI is to assist the rector in formulating the quality document for the university. The document has been published and then disseminated in the faculty level and study program level. The quality assurance in the faculty level is named Unit for Planning, Development, Quality Assurance and Cooperation (Unit Perencanaan Pengembangan Penjaminan Mutu dan Kerjasama - UP3K). The corresponding unit in study program is named Internal Quality Assurance Team (Tim Penjaminan Mutu Internal - TPMI). In implementing their task, the three units coordinate and complement each other in accordance with their scope of works. One of the main tasks of quality assurance in the study program level is to identify the staff that is competent in teaching a certain subject, or capable to be coordinator of teaching team. Civil Engineering of UNHAS (CESP) is supported by 45 academic staffs that are competent on executing their task. The academic staffs are grouped into 5 divisions (Kelompok Keahlian Dasar, KKD), namely KKD Water Resources, KKD Transportation, KKD Structure, KKD Construction Management, and KKD Geotechnics. Nevertheless, several faculty member has lacking in English skill.

Academic staffs at the Department are competent to conduct teaching and learning activities as indicated by obtaining Certificate of Teaching Competency (Academic Staff Certification). All the staffs have qualification of at least Master Degree (the current minimum degree requirement according to the standard of Directorate General of Higher Education, DGHE) with about 64% among them hold PhD degree and 36% (16 persons) hold Master degree. All the academic staffs are full time (Table 6.1).

Besides identifying competencies of the academic staff, other main task of quality assurance team is to evaluate the performance of the staff in carrying out the university missions, i.e. the tridarma. The evaluation is carried out in 2 phases:

a. Phase I is the ongoing evaluation where quality assurance team monitors staff's performances by observing the student attendance lists and by comparing the subject that already taught with the documented teaching plan (GBRP).

b. Phase II is at the end of semester evaluation by distributing questionnaires to students. The contents of the questionnaires such as the timeliness of the class, compliances to planned subject, media and strategies used in teaching, and so on. The questionnaires are also distributed to teaching staff.

6.5. Training and developmental needs of academic staff are identified and activities are implemented to fulfill them

In order to increase the competency of academic staff, CEUH always conduct or send staff to trainings in country or abroad. The following table shows the training activities for the last three years.

Table 6-5 Training activities

No	Types of Training	No. of Academic Staff
1	PEKERTI	5
2	AA	3
3	Developing teaching subjects	30
4	Developing capability for laboratory management and keeping/maintenance data base of study program	15
5	Workshop in preparing teaching modules	30
6	Training in writing international publication	20
7	International Short course	15
8	Civil Engineering Software	25
9	Quality assurance training	7

In order to increase the competence of the staff is done by training PEKERTI and AA (Applied Approach). Hasanuddin University has LKPP HR Study Center (teaching and learning development department) that regularly conducts training to improve learning capacity through the training of PEKERTI-AA, especially for new staffs.

The improvement trainings, basic skills on instructional techniques (PEKERTI) and Applied Approach (AA), is important in the professional development of faculty members owing to curriculum set by the Higher Education in line with Law No. 14 of 2005 on Teachers and Faculty members. PEKERTI-AA program is a training program designed by Directorate General of Higher Education for the improvement of pedagogical competence for faculty members.

Training begins by identifying the position of 'subjects' taught by the participants in the curricula (competency-based) courses. Participants of PEKERTI-AA were asked to

make analysis of competencies which further elaborated in Syllabus of the Subjects and Implementation Design (RPP), a part of the task of faculty members in designing and planning the learning process. The paradigm shift, from content-based to the competence-based, encourages the participants to create a learning experience, develop instructional materials and media in accordance with the required competence.

PEKERTI-AA training is divided into two stages. Stage I, face to face training with presentation of the material with duration of 6 days which effectively last 48 hours. Delivery technique at this stage is with active participation, discussion and performing tasks. Phase II, PEKERTI participant designs and implements the knowledge to the courses taught in the semester, the training also lasts 6 days which effectively covers 48 hours.

To review the ability in managing learning/teaching process, the faculty conducts evaluation of faculty members by students. The results are then submitted to the respective faculty members then followed up by reviewing skills to manage learning. For the last 3 years, study program obtain funding from BOPTN program which are very helpful in the development of staffs of civil engineering study program.

6.6. Performance management including rewards and recognition is implemented to motivate and support education, research and service.

According to the law no 14 year 2005 regarding teacher and faculty member, every faculty member is entitled to professional allowance in order to motivate them in teaching and research activities. In addition to that, university also rewards faculty member in the form of remuneration which is calculated based on the performance in the semester. Each type of activities performed in the semester is assigned a score, and accumulated scores in the semester then rewarded financially.

University also provides financial reward as token of appreciation for staff that newly graduates. The reward could help cover the education cost. The university by financial reward also encourages faculty member to present paper in seminar, conference, or to publish in reputable journal. Other financial sources or grants also available, such as from Directorate general of higher education or industry, that could be used in improving research and community services

Table 6-6 Number of staff received reward and recognition during the last 3 years

Rewards	No. of academic staff
Remuneration	45
Lecture Performance Allowances (BKD)	42
International Publications	15
Reward For Graduate	16

6.7. The types and quantity of research activities by academic staff are established,

Research is a yearly agenda either a research that completed within a year, or a multiyear research program. These researches are funded by engineering faculty, the university, or directorate general of higher education. The research is conducted based on the roadmap of research from each basic education laboratory or from research laboratory. With a clear roadmap the research could be continually performed. In addition to that, researches are also conducted with cooperation with other institutions either private company or government institutions. To assure the continuation of research activities, every year the university and faculty allocate funding obtained from government budget (DIPA) or from university's own fund to be used for research and for community services. As the factors in evaluation of research activities, and for improving research capacity, CEUH strongly encourage to disseminate results of researches through publication in international or national journal or through local, national or international seminar. Currently CEUH has its own international level academic event which is called Makassar International Conference on Civil Engineering (MICCE) which is conducted every two years. Numbers of research by each research group (KKD) for the last three years is shown in Table 6-7.

Table 6-7 Number of Research in each group (KKD)

Academic year	Group				
	Water resources	Structure	Transportation	Geotechnics	Management
2013	12	13	25	15	12
2014	8	11	10	8	13
2015	9	14	18	13	22

In order to develop interest and to increase capacity of academic staff in research activity, CEUH from time to time conducts benchmarking either in country or abroad. The last benchmarking was performed by sending staff to have a short term research program to prominent universities in Japan to learn the implementation of LBE and to increase publication.

7. SUPPORT STAFF QUALITY

7.1. Support staff planning (at the library, laboratory, IT facility and student services) is carried out to fulfill the needs for education, research and service

In order to fulfill the needs for education, research and services of CESP, the university has provided a numbers of supporting staff which is 7 person of administration staffs, 6 person lab technician, 39 staff for library and 2 person of security. Table 7.1 shows a list of CESP supporting staff. Recruitment of supporting staffs are regulated by university (Unhas) based on CESP requirement proposal. Types or competence and quantity of staffs were determined base on requirement analysis by CESP.

Table 7-1 Types, Numbers and Education Level of Support Staff in CESP.

No.	Support Staff	No of Support Staff & Level of Education								Job Area
		S3	S2	S1	D4	D3	D2	D1	HS	
1	Librarian	1	4	28		6				Central Library/CESP
2	Lab Technician/ Analyst/ Operator/ Programmer			3					2	CESP Laboratory
3	Administrative Staff			3		1			2	Department Office
4	Others : Security							1	1	Area of CESP
Total		**1**	**4**	**34**		**7**		**1**	**5**	

Computerized data based system in the Library will provide access to list of references such as journals, proceedings, books and thesis/dissertation collections. Library information can be accessed through website of the university that has link to web of CESP. Internet access facilities in the library are managed at the university level. The university library can also provide various kinds of books, journals, proceedings and other type of references for variety of disciplines. All this effort is to support the ELO 9.

There are 5 units of laboratory which are handled by 5 laboratory technician persons. All staff was recruited by university based on required competences specified by CESP. Each laboratory staff is under the management of a head of laboratory. The laboratory staff has attended some training to improve their capability in handling the laboratory activities. These trainings demonstrated the attention of the department management to increase the

competence of the support staff. The lab facilities are continuously improved and completed. Currently some laboratories is preparing for lab accreditation, ISO 17025. Laboratory technician roles are to assist the practical works in the lab and in the field, and to help setting up research experiments for the academics starting from material preparations, equipment usages and maintenance. Currently, the CESP has adequate number of lab technicians to support the research activities of 12 research groups. The education of lab technicians are high school/vocational school graduates in engineering diploma or bachelor's degree. The department continuously facilitates the training and internships to increase the lab technician's competencies.

In the daily activities dealing with the students particularly in administrative affairs, the CESP are supported by 3 qualified administrative staffs who are assigned at the university level. Even though the ratio of staff to student is approximately 1:230, however all of administration activities could be handled on time. This because of the computerized link and online system has been applied in the Hasanuddin University. All these support staff are under the Head of Administration affair at the department, who reports directly to the Head of Department.

In order to achieve a satisfactory level of service, the academic staff is encouraged to attend trainings. A number of trainings and benchmarking are provided to increase and enhance their skills and knowledge. Benchmarking is needed since the learned stuff can be incorporated in the standard operational system of CESP which is under continuous improvement.

Two people were assigned as special security guarding the civil building. Implementation of security tasks are directly managed by faculty.

7.2. Recruitment and selection criteria for appointment, deployment and promotion are determined and communicated

The recruitment, general selection criteria for appointment, deployment and promotion of supporting staff is generally regulated at the university and faculty level. However, specific criteria such as personal specifications, educational, and numbers of requirement are proposed by CESP to the university through faculty. In certain cases, head of CESP can perform an internal rotation of staff duties by considering effectiveness and performance of the implementation of tasks. In contrary, staff mutation conducted by

faculty sometimes brings negatively impact the CESP performance.

To achieve ELO of CESP, the academic administration services should be smoothly and effectively performed without any significant obstacles. Therefore, the head of CESP has regularly evaluated the performance of each staff based on merits, qualifications, and experiences.

Support staffs that have a good performance will be recommended by CESP to the faculty for career promotion.

7.3. Training and developmental needs of support staff are identified and activities are implemented to fulfill them

The CESP has a clear planning for training and development of support staffs. The planning is described systematic in Table 7.2.

Table 7-2 Training program in CESP

No.	Event For Improvement	Planning Program	Development Program Activities
1	Improvement of university online system by Management Information System (SIM)	Enhancement of CESP support staff capability to handle the SIM system in the level of CESP	Trainings
2	Additional system developed by Faculty of Engineering to support SIM. This system namely Academic Information System (SIAKAD)	Enhancement of CESP support staff capability to handle the SIAKAD system in the level of CESP	Trainings
3	Complementary Requirement in the CESP level	Enhancement of CESP support staff capability to handle the administrative services, laboratory services and maintenance, library operational system, etc.	Trainings, Bench-marking

The improvement plans for support staff were executed with support by routine funding from annual RKAT/BOPTN, grand from university, grand from Alumni Association (IKATSI), other collaborations, etc. The education training/courses conducted on support staff in the form of: competency/skill training such as advanced computer training; administrative service skill training; laboratory certification training; academic

journal management training; academic clerkship training; leadership and finance management training; etc.

The training and development activities are conducted in accordance with the requirements in order to improve the capability of CESP support staffs as seen in Table 7.2 regarding the plan for CESP training and development activities. The needs of the CESP to improve the staff capability professionally were obtained through upgrading, certification and training.

One of the efforts to increase the capacity of the study program, the University of Hasanuddin allocated operational funds from State University (BOPTN) to CESP. One of the activities proposed in the year 2013-2014 is to increase the capacity of educational staff including:

1. Involving 2 support staffs in training of lab management in 2013.
2. Involving 3 administrative staffs in management training in Surabaya in 2013.
3. Training in Management Information System for operator in 2014.
4. Training in preparation and filling a data base of academic and student administration (3) 2015.
5. Benchmarking to the University of Indonesia who have AUN-QA assessment, to study the academic administration management system.

In the future, CESP considers to involve support staff into training for English and certification laboratory technician.

7.4. Performance management including rewards and recognition is implemented to motivate and support education, research and service

University, faculty of engineering, and department management levels have established schemes to encourage, support, motivate, and sustain activities in education, research, and community services. The supports are provided in terms of funding, acknowledgement, special task assignment, and promotions.

8. STUDENT QUALITY AND SUPPORT

8.1. The student intake policy and admission criteria are defined, communicated, published, and updated

Ministry of Education issued regulation No.30/2010 regarding "New Student Admission Scheme for Public University". Further detailed student intake policy and admission criteria are clearly formulated and periodically reviewed. Hasanuddin University admission policy, criterion, procedures, requirements and examination schedule are clearly stated in the university handbook, brochure, posted on the website, http://www.unhas.ac.id/pmb/ and are also directly distributed to high schools. Furthermore, CESP annually conducts dissemination to motivate the prospective students.

8.2. The methods and criteria for the selection of students are determined and evaluated

Several entry schemes are:

1. SNMPTN, a special invitation for high school potential graduates which has an excellent academic performance.
2. SBMPTN, National Admission Selection for Public University. Managed and registered by Ministry of Education. It is conducted by registering on official websites and then followed by written examination.
3. POSK, Local/Hasanuddin University entrance test for those having exceptional potential in Arts, Sports and sciences.
4. PMJNS, Local/Hasanuddin University Entrance Test.

All student candidates have graduated from high school (SMU, SMK or Madrasah Aliyah) should pass the National Exam (UN).

Table 8-1 Intake of First-Year Students

Entrance Year	Applicants		
	No. Applied	No. Offered	No. Admitted/ Enrolled
2010	1382	130	120
2011	1742	127	175
2012	2140	129	121
2013	3471	145	136
2014	4485	114	108
2015	4854	115	115

Table 8-2 Total Number of Students (last 5 years)

Entrance Year	**Student**					
	1st Year (2011)	**2nd Year (2010)**	**3rd Year (2009)**	**4th Year (2007)**	**>4thYear (2006)**	**Total**
2010	120	130	148	108	98	604
2011	175	117	130	148	86	656
2012	121	163	117	130	122	653
2013	136	109	163	117	127	652
2014	108	124	109	163	112	616
2015	115	103	124	109	146	597

8.3. There is an adequate monitoring system for student progress, academic performance, and workload

Civil Engineering of Hasanuddin University has an academic regulation that deals with all academic system implemented. Monitoring the academic progress of each student is regularly handled by an academic advisor. Academic advisor who is a faculty member, in addition to carrying out the functions tri dharma college, also is in charge of guiding students appointed by the dean. Monitoring system for student progress, academic performance and workload can be accessed by online system (http://sim.unhas.ac.id/). Furthermore, engineering faculty developed internal monitoring system (SIAKA) that can be accessed on the following link http://siaka.unhas.ac.id/pasca/index.php. The SIAKA provides more detail information about student's academic performance (i.e. grade point average, GPA, credit hours achievement, etc) and can be used by parents to remotely monitor the student progress.

In the Civil Engineering Program, in addition to seminar type lectures, CEUH also conduct laboratory practicum which is mandatory for every student. Currently laboratory activities are carried out by Lab Based Education (LBE).

Based on LBE, laboratory assistant, selected from post-graduate students, mentors the students during laboratory session. Consulting, guidance and sharing information are also performed by laboratory assistant.

At university level, there are consultation and guidance for student via websites. The student can find any information about university rules, official staff, and guidance to use the university facilities and consult the problem that student facing during study.

Related to each student activity monitoring, any activity that is considered not in accordance with prescribed rules will be processed through the disciplinary commission meeting.

In imposing sanctions on students following procedures are considered:

1. Reports from students, staff, faculty or official from the Dean/ Head of department/section/study/discipline commission orally or in writing.
2. Academic violations adequately resolved by the Dean of the faculty.
3. Suspension for violations is settled at the university level, with reporting procedures of the Dean accompanied dossier and recommendations regarding penalties for academic violations.

8.4. Academic advice, co-curricular activities, student competition, and other student support services are available to improve learning and employability

At the department level, student academic progress was monitored by the academic staff. The academic staff are collecting and accumulating the document of student progress every semester.

Each student consult Study Planning Card (KRS) in the early of semester to the mentor after evaluating the last 2 semesters by face to face meeting and using the SIM (System Information and Management). All students, academic staff and support staff can access SIM, so then all can find the progress of student online.

New students are required to take the course as much as 20 credits / semester for the first 4 semesters. Credit hours passed should reach as much as 48 credits at the end of the fourth semester, and a GPA of at least 2.0 (Two point zero). When the student cannot reach the target, the student needs special attention from the Academic Advisor to resolve the problem.

Field Work Practice adviser (KP) mentors and monitors the activity of student during field work practice and evaluates their reports in a seminar.

CESP also provides an opportunity to students to develop their talents and interest. In carrying out activities of extracurricular, students are accompanied by secretary for student affair. In order to support the extracurricular activities, Hasanuddin University provides facilities in student activities center such as art and sport center.

In addition, Table 8-3, there are several scholarships that students can apply for. Bidik Misi scholarship provides an opportunity for prospective students who have potential academic but did not have the financial ability. It is provided by the Directorate General of Higher Education (DGHE).

Table 8-3 Type of Scholarships and the number of Grantee

SCHOLARSHIP	GRANTEE					Scholarship covered
	2010	2011	2012	2013	2014	
BIDIK MISI	11	11	12			Tuition, living cost, books and practice fee
PPA	44	29	32			Tuition
BBM		56	46			Tuition
SUPERSEMAR	2	3				Tuition
DIKNAS	11					Tuition
BI	3					Tuition
PROGRAM I MHERE	1					Tuition
TSBD	2					Tuition
YKPP PERTAMINA	1					Tuition
IKATSI					20	

8.5. The physical, social and psychological environment is conducive for education and research as well as personal well-being

CESP has sufficient physical facilities to provide a good academic atmosphere for education and research. Each laboratory in LBE scheme has a research room, which equipped with meeting room, computer, printer, internet connection (24 hours) and small lounge. Discussion in the research room with a comfortable atmosphere could enhance the student's understanding of subject.

Social and sports activities are organized by student association such as HMS (CE

student society), CE football team, etc. but guided by Sekma (secretary for student affairs). Facilities are provided by the faculty and university to support their activities. Student creativity and activity center (PKM), sports field, wall climb, etc. accommodate student‘s activities. The activities are monitored and graded based on achievements and then awarded as 1 credit hour course.

Engineering faculty made relationship and cooperation with national and international company. Student with excellent qualification are invited to attend test for Coops work and test for job opportunities. General recruitment by employer is also provided by University in Job Fair activity.

9. FACILITIES AND INFRASTRUCTURE

9.1. The teaching and learning facilities and equipment (lecture halls, classrooms, project rooms, etc.) are adequate and updated to support education and research

Currently the Faculty of Engineering is in the development stage of new campus buildings and new laboratories in Gowa, including the Civil Department.

Classroom building is designed specifically for an integrated lecture consists of 4 floors with a total of 75 classrooms with 150-200 m² area each classroom. Capacity of classrooms is 50-100 students. Each lecture room is equipped with standard amenities such as desk and chairs, whiteboard, and LCD projector.

Rooms for all laboratory Head and the entire faculty of civil department (48 lectures) are provided each with an area of 9 m^2 - 24 m^2. The room is equipped with work desk, chair, computer and printer, and a bookcase.

The entire infrastructures, as given in Table 9.1, more than adequately support CESP in achieving ELO, and are able to create conducive academic atmosphere. Number of rooms and types of equipment in the laboratory are appropriate and complete. It is useful for lectures and students in implementing the process of learning, training, testing, and research. The total area of CESP is 2433.97 m^2 consists of 53 rooms.

Existing facilities and infrastructure managed by the civil engineering department meets the standards required by the Indonesian Government Regulation No.19 of 2005 on National Education Standards (Chapter VII Infrastructure Standards) and the Decree of the Minister of National Education of the Republic of Indonesia 234/U/2000 on Guidelines for Establishment of Universities, thus the process of implementation of the higher education Tri Dharma could be held regularly and continuously.

Table 9-1 Teaching and learning facilities

No.	Facilities	Units	Total Area (m^2)	Utility (Hour/ week)
1	Lecture room	53	2.433,97	40
2	Office room	7	230,68	40
3	Class room	9	800,40	40
4	Library room	2	203,00	40
5	Laboratory	6	2534,10	40

No.	Facilities	Units	Total Area (m^2)	Utility (Hour/ week)
7	Administration room	1	109.00	40
8	Meeting room	8	196.97	40
9	Seminar room	2	194.40	40
10	Canteen	2	227.06	40
11	Research Room	21	1.036,99	40
12	Mushallah	1	40	40
13	Pantry	1	10	40
14	Lecture Theatre - CSA	3	239	40
15	Reception room	2	41	40
16	Journals Room	1	59	40
17	Stationary room	1	16	40

9.2. The library and its resources are adequate and updated to support education and research

At university level, Hasanuddin University library provides more than 50.000 books, various magazines, newspaper, printed copies of thesis and dissertation. The library is equipped with computer facilities with internet links that can be used by students to search on-line international journals. The number of university library staffs is 71, including 14 administrative staffs.

Library Facilities of Faculty of Engineering at the Campus Gowa are integrated with 4 (four) floors and a total area of 4945 m^2. The building is equipped with a central computer room, lecture theatre (864 m^2). Civil Engineering library facilities are placed in Civil Engineering Building with an area of around 150 m^2. Currently the library serves students with various facilities such as text books, national and international journals, civil engineering magazines, printed copies of thesis and dissertation as shown on Table 9.2 below. All libraries opened from 08.00 am to 16.00 pm, Monday to Friday.

Table 9-2 Availability of books references on CESP Library

Types of references	Number of titles	Number of copies

Text book	1.126	1.812
Accredited national journals	3	23
International journals	4	48
proceedings	16	20
Final projects/thesis	961	1.773
Dissertation	86	86
TOTAL	**2.202**	**3.762**

CESP also has a library that can be accessed online with very good facilities such as link.springer.com and www.ilt.saga-u.ac.jp/ialt/lti/ through both of the e-library the academicians could access a variety of journals and results research that can be used as reference in research and community service.

9.3. The laboratories and equipment are adequate and updated to support education and research

Civil Engineering Laboratory Building in Gowa campus has four (4) floors with a total area of 7466 m^2. This building was facilitated with five (5) basic laboratory and 12 research laboratories. In addition, the building is equipped with Head of Laboratory room, Professors room, Associate professors room, Lectures room, Seminar room, laboratory seminar room, toilet and pantry on every floor, mushallah (praying room), and Administration including Head of Department room, Secretary of Department room, and Wi-Fi network facilities that can reach every floor.

Every room is equipped with a work desk, chairs, cabinets, PC Desktop 1 (one) unit and a printer. Each seminar room in the Department and in laboratories equipped with LCD permanently. Facilities and equipment on each laboratory are adequate for research.

Five basic laboratories are Hydraulics, Geotechnical, Transportation, Geodetic, and Structure. Every laboratory has technician which assigned to assist student during practicum or research but still do not have certified technician. Repairs of broken equipment is conducted and handled directly by the manufacturer's technicians. Furthermore, calibration of equipment is performed periodically.

Each laboratory is equipped with new technology and most of it is operated digitally as show on Table 9.3. In addition, each laboratory is also equipped with several types of security tools such as helmets, gloves, fire extinguishers, sprinkler etc.

Table 9-3 Laboratory Facilities and Equipments

No.	Laboratory	Main Facilities	Units	Utilities (hours/week)

No.	Laboratory	Main Facilities	Units	Utilities (hours/week)
		Light Sondir 2 ton and Accessories	6	
1	Geotechnical	Hand Bore testing set	3	40
		Sand Cone testing set	2	
		Sieve set	2	
		Triaxial compressor apparatus	1	
		Consolidation testing	5	
		Unconfined Compression Testing	1	
		Direct shear machine	1	
		Standard Proctor Hammer	1	
		CBR	1	
2	Hydraulics	Sediment transport Demonstration Channel	1	40
		Computer Compatible Manometer Bank	1	
		Electromagnetic current meter (laboratory)	4	
		Self contained tilting flume	1	
		Dam spillway model	1	
		Siphon spillway	1	
		Open Channel	1	
		Rainfall Simulator	1	
		Fluids Pressures Apparatus	1	
		Current Flow Meter	1	
		Fluid Friction in Pipes	1	
		Osborne Reynolds	1	
3	Structure and Materials	Universal Testing Machine 1000 KN	1	40
		Computerized Fatigue Test Machine with Loading Frame 1500 KN	1	
		Fatigue servo controller system	1	
		Data Logger TDS-530 (30 channel)	1	
		Static Loading Frame with Hydraulic Jack 1500 KN	1	
		Static servo controller system	2	
		High Speed data logger THS-1100	2	
		Dynamic Data Logger 4 channel	1	
		Switch Box (50 channel)	2	
		Hydraulic jack actuator for cyclic load 1500 KN	1	
		Load Cell, capacity 100KN – 1.000KN	6	
		Electric Chain Hoist	1	
		LVDT-10 mm – 100 mm	32	
		Magnetic Stand	12	
		Core drilling	1	
		Schmidt Hammer Test	2	

No.	Laboratory	Main Facilities	Units	Utilities
		Strong wall and floor	1	
		Steel frame 200 cm	1	
		Compressometer	2	
		Concrete mixture	1	
		Compression testing (UTM) caps. 2000 KN	1	
		Compression testing (UTM) caps. 1000 KN	1	
4	Geodetics Surveys	Digital Level type1	2	40
		Construction level	2	
		Laser level	2	
		Digital Level type2	2	
		Multi Purpose Laser Level Exterior & Interior	2	
		Dual grade laser level	2	
		Semi Total Station	2	
		Electronic Digital Theodolite type 1	2	
		Electronic Digital Theodolite type 2	2	
		Total Station	2	
		Total station, non-motorized 3"	1	
		GPS RTK System	1	
		Locating GPS	2	
		Street GPS	2	
		Mapping GPS	2	
5	Transportation	Water bath	6	40
		Ductility Apparatus	1	
		los Angeles Machine	1	
		Softening point of bitumen apparatus	2	
		Saybolt viscosimeter	1	
		Bricket Hammer	5	
		Marshall test	2	
		Computer simulation	3	

9.4. The IT facilities including e-learning infrastructure are adequate and updated to support education and research

Online learning system (E-Learning) has also been carried out by CESP and has been programmed by university. It is supported by adequate internet connection and LMS application. Lectures, staff and all CESP students can access LMS. LMS is a system of e-learning (electronic learning) available to all academicians in Hasanuddin University. Lecture and students could perform teaching and learning activities in LMS by uploading course materials, references, assignments, etc. and students can attend the courses, read the

course references, and do the tasks and problems given by the faculty member. More than 50% of CESP courses already available on LMS. Nonetheless, several faculty member do not take advantage of e-learning facilities.

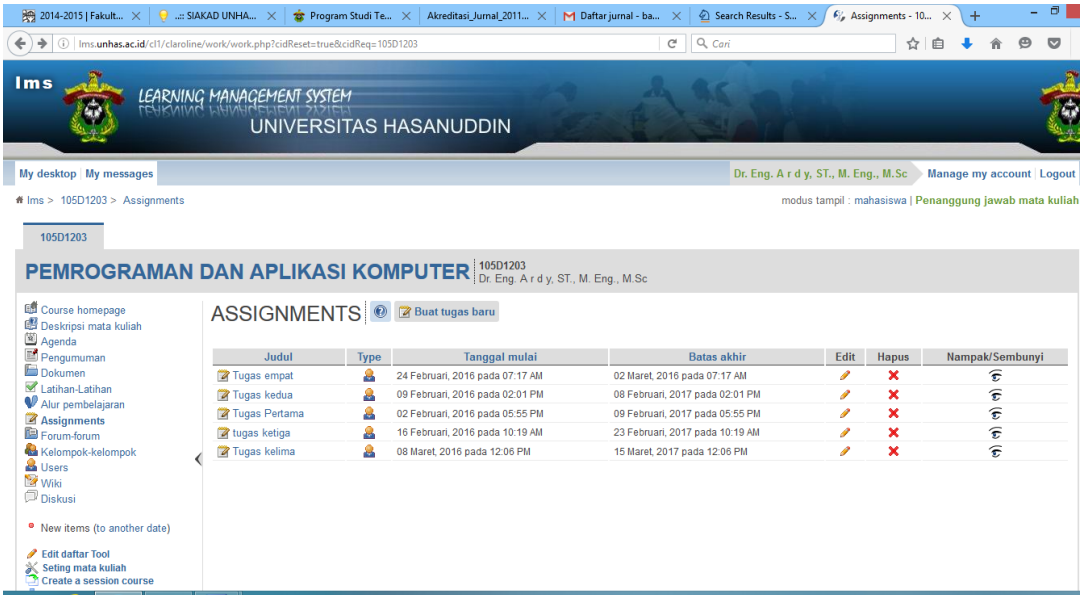

Figure 9-8 LMS Application for e-learning

Currently at the CESP is facilitated with 91 Desktop units and 28 units of laptops for research, teaching and administration with processor specifications i7, i5 and i3. CESP provides internet access for entire academician. This network can be accessed using the wireless / hotspot or by line network. System and hotspot wireless network to access the internet used by academicians is ADSL + UTN system with a capacity of 1 MBPS accessible 24 hours. All academicians are given with a user name and password to access the Internet network. This system is managed by the faculty of engineering. CESP also set up a computer room with 20 units.

9.5. The standards for environment, health and safety; and access for people with special needs are defined and implemented

Generally, the security system is managed by regularly practicing and maintaining important equipment for safety and security in campus. Practice involves equipment such as extinguishers, hydrants, and sirens. It also maintains and requires safety practices in the laboratory. CESP building is also equipped with an evacuation route that directs people

during natural disasters and fires. During the practicum, students are required to wear laboratories clothes and use helmets, gloves and safety shoes in the laboratory with heavy equipment. Nonetheless, Simulation and inspection of the disaster management facilities have not been conducted periodically.

CESP waste management separates organic and inorganic waste. Each floors of the building is equipped with the trash and garbage container which is regularly transported to the landfill. To maintain the cleanliness of the building on each floor CESP assigns a janitor to clean the building every day.

Students and staff also plays an important role in maintaining the cleanliness, CESP constantly remind students and staff to keep maintain clean rooms. Every Friday staffs do voluntary work by cleaning the campus and monthly with students conduct cleaning of building and laboratory equipment.

10. QUALITY ENHANCEMENT

10.1. Stakeholders' needs and feedback serve as input to curriculum design and development

The curriculum review is scheduled at the end of academic year by the expert group of faculty members/laboratories by referring to core curriculum developed by the Consultative Board of Civil Engineering Higher Education in Indonesia (Badan Musyawarah Perguruan Tinggi Teknik Sipil seluruh Indonesia/BMPTTSI). Curriculum development is discussed in the CESP involving internal and external stakeholders (expert group of faculty members/laboratories, alumni, local governments, professional associations such as: PII, LPJK, HATHI, HATTI, HAKI, INKINDO, PATI, and students) with regard to the vision, mission and feedback received by CESP. Discussion also considers development of science and technology. Activities in the form of FGD (Forum Group Discussion), tracer studies, the alumni gathering, workshops, etc, are performed periodically to obtain input to revise and develop a robust curriculum.

10.2. The curriculum design and development process is established and subjected to evaluation and enhancement

The curriculum development involves all teaching staff members, alumni and stakeholders actively and systematically obtain inputs for formulation of graduate's profile and expected learning outcomes (ELO). The design process of the curriculum development is shown in Figure 10.1.

All faculty members have been involved in the curriculum revision, and they are required to prepare teaching modules and GBRP (***Garis Besar Pokok Pengajaran*** – Course Outlines). In addition, the skills and competency of staffs are consistently upgraded by assigning them to attend trainings, international seminars and curriculum development workshops.

The staff's contribution on the design process of the curriculum shown in Figure 10.1 can be described as follow:

- The committee of the curriculum development proposes the design of the graduates' profile and achievements of the learning process;
- Focus Group Discussion conduct the collection of the study materials;

- Workshop on evaluation and arranging of the courses and their credits.
- Workshop on the development of the curriculum structure
- Meeting of the teaching staffs on the curriculum establishment

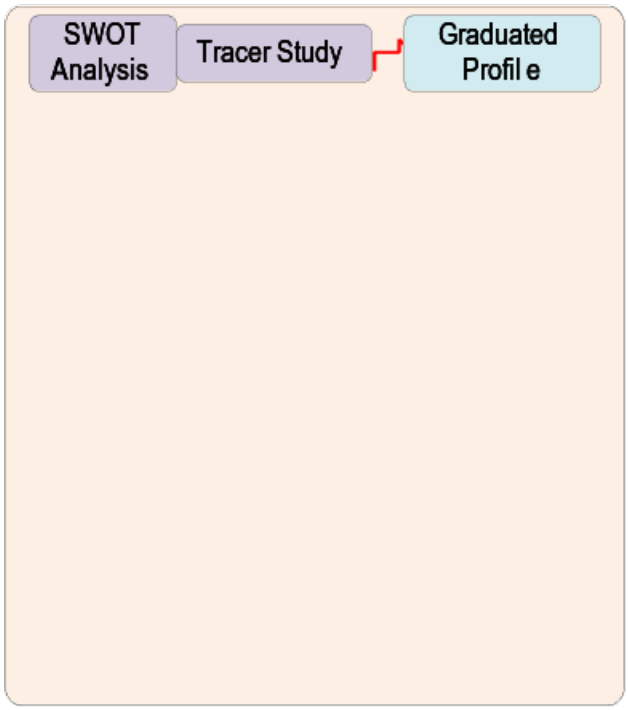

Figure 10-9 Design Process of CESP Curriculum

In curriculum evaluation and development, the entire academic community of CESP actively involves such as in preparing GBRP (***Garis Besar Pokok Pengajaran*** – Course Outlines) and teaching materials, collecting the latest information in civil engineering development, and upgrading their skill and knowledge by attending trainings and seminars for curriculum development.

Stakeholders have an important role in providing input related to the market demand and the expected learning outcomes. Hence curriculum development is still considering the user's demand and the development of science and technology in the field of civil engineering.

10.3. The teaching and learning processes and student assessment are continuously reviewed and evaluated to ensure their relevance and alignment

In an effort to continuously improve the quality of the learning process, CESP already has a team monitoring and evaluation in the form of the Internal Quality Assurance Team (TPMI) which is assigned to monitor, assess and evaluate the learning process, course materials and assessment systems of each semester. Team's monitoring and evaluation are also an integrated part of the monitoring system established and carried out by the Faculty of Engineering Hasanuddin University through institutions of Planning, Development, Quality Assurance and Cooperation Unit (UP3K) Faculty of Engineering Hasanuddin University, and monitoring system at the university level through the Institute for Research and Education Development (LKPP)/Tim SIM PTIK UNHAS. Based on the results of evaluation and monitoring by UP3K, CEUH improves teaching materials, teaching methods, learning technology, online media usage, and methods of evaluation and assessment system.

Figure 10.2 describes the quality assurance cycle which have been conducted in CESP. This is carried out by the quality assurance team in university, faculty and CESP. Further, the recommendation from the quality assurance is executed by CESP. To achive optimum service, the role Quality Assurance unit should be enhanced to obtain better evaluating teaching and learning process.

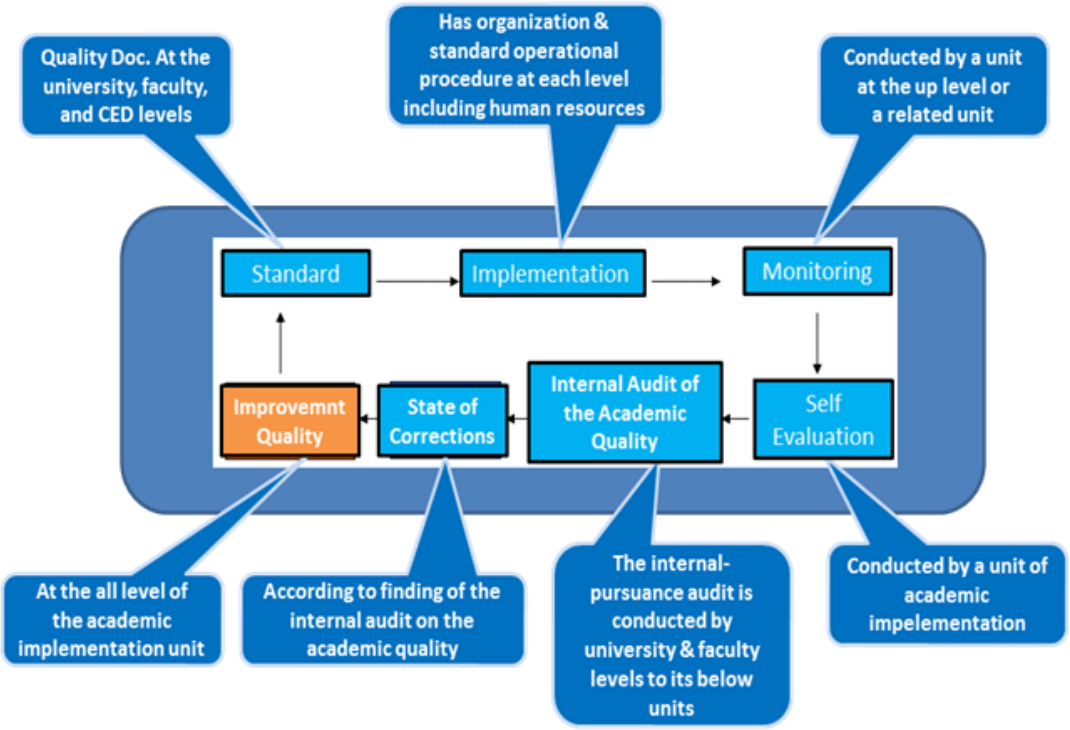

Figure 10-10 Quality Assurance Cycle in CESP

10.4. Research output is used to enhance teaching and learning

The availability of complete laboratory facilities encourages enhanced research work and laboratory-based education. The improvements can be seen from the increasing number of publications in journals (national and international) as well as participation in national and international seminars. Several research output have been published in book form as presented in the following table:

Table 10-1 List of book based on research outputs of staff

No.	No. ISBN	Judul dan Penerbit	Author's	Publication
1	ISBN: 978-979-756-848-1 2012	Perencanaan Infrastruktur Transportasi Wilayah. Publisher: Graha Ilmu, Jogjakarta	Sakti Adji Adisasmita	Book
2	ISBN: 978-979-756-838-2 2012	Penerbangan dan Bandar Udara. Publisher: Graha Ilmu, Jogjakarta	Sakti Adji Adisasmita	Book
3	ISBN: 978-979-756-776-7 2013	Perencanaan Transportasi. Publisher: Universitas Terbuka, Jakarta	Sakti Adji Adisasmita	Book
4	ISBN: 978-	Mega City dan Mega Airport.	Sakti Adji	Book

	979-756-997-6 2013	Publisher: Graha Ilmu, Jogjakarta	Adisasmita	
5	ISBN: 978-602-262-232-1 2014	Transportasi Komprehensif dan Multi Moda. Publisher: Graha Ilmu, Jogjakarta	Sakti Adji Adisasmita	Book
6	ISBN: 978-602-262-187-4 2014	Tatanan Bandar Udara Nasional. Publisher: Graha Ilmu, Jogjakarta	Sakti Adji Adisasmita	Book
7	2012	Semen dan Beton Berongga. Publisher: Cv. Telaga Zamzam	MW. Tjaronge	Book
8.	2012	Seismic Design of Building Effect of Earthquakes and design provisions Publisher: Badan Penerbit UNM	Herman Parung	Book
9	2016	Composite Structures Behavior Under Earthquake Loading Publisher: -	Herman Parung	Book
10	ISBN: 978-602-1279-34-2 2016	Emisi Transportasi Publisher: Penebar Plus	Sumarni Hamid aly	Book

10.5. Quality of support services and facilities (at the library, laboratory, IT facility and student services) is subjected to evaluation and enhancement

To guarantee the implementation of academic activities is conducive, CESP have buildings and classrooms, administration room, library, laboratories, lecture rooms, as well as space and other supporting facilities very complete to be used by academic staffs and students in implementing the process of learning, training, testing and research.

These places have been provided with Internet, thus *civitas* academic can utilize information technology. Other facilities include LCD, whiteboard, air conditioning and other amenities. The whole infrastructure of the building located on the campus Techniques Gowa.

In addition, CESP provide Internet access using wireless/hotspot which can be accessed by the entire academic community. The network system is used in the form of ADSL + UTN system with a capacity of 1 MBPS managed by the Engineering Faculty. Each academic community is equipped with a user name and password. Capacity for administration staff is greater than for academic staffs and students, because it is used for online administration.

The CESP is supported by a well-stocked library (hard copy and soft copy that can be accessed online). The library is located at the level of the university, faculty and department. In addition, access to the online journal databases can also be performed. There are some libraries outside the institution which can be accessed manually and online with very good facilities as shown in Table 10.2.

Table 10-2 Hyperlink of online library

No.	Library Name	Website
1	Hasanuddin Univ. Library	www.unhas.ac.id/perpustakaan
2	Online Journal Internasional (via Engineering Campus Gowa)	www.link.springer.com
3	ILT-SAGA Library	www.ilt.saga-u.ac.jp

Library facilities of Faculty of Engineering at the Campus Gowa occupy four floor building with a total area of 4945 m^2. The building is equipped with a central computer room and lecture theatre (864 m^2). Civil Engineering library facilities placed in Civil Engineering Building Campus Gowa with an area of around 150 m^2. Currently the library serves students with various facilities such as text books, national and international journals, civil engineering magazines, printed copies of thesis and dissertation. The number of collections at the CE Library is 2,202 titles, including 1126 handbooks and textbooks in English. There are 23 journals, including 4 international journals. The library also keeps thesis, dissertation and other reports from students. This is to support the ELO 9.

Civil Engineering Building in Gowa campus consists of four (4) stories with a total area of 7,466 m^2. This building was facilitated with five (5) teaching laboratories and 12 research laboratories. In addition, the building is equipped with a laboratory, staffs' rooms, seminar room, laboratory seminar room, toilet and pantry at every floor. All administrative staffs are also facilitated with working spaces. Wi-Fi network facilities can reach every floor, including the laboratory rooms.

Five teaching laboratories are Hydraulics, Geotechnical, Transportation, Geodetic, and Structure. Each laboratory is equipped with the most sophisticated equipments and operated mostly digitally. The equipments have been procured using the fund from JICA (***Japan International Cooperation Agency***) as parts of the Engineering Faculty

Development Project. The Structural Engineering Laboratory, for example, is now equipped with fatigue testing machine, shear wall and strong floor which can be used to test full-scale structures such as beam-column sub-assemblages and pre-stressed piles. The Hydraulic Laboratory has procured several equipments directly from ARMFIED, UK such as flumes. This laboratory has also a sophisticated Rain Simulator. Currently some laboratories is preparing for laboratory accreditation **ISO 17025**.

All rooms are equipped with safety equipment including fire extinguishers, helmet, etc. The available equipments are very adequate for research, not only by students and staffs but also by partners. In 2015, PT WIKA has used the equipments for testing the flexural capacity of pre-stressed spun piles and train sleeper. A joint research with a partner from Japan has also been conducted to test the capacity of precast open channels.

There are 91 Desktop units and 28 units of laptops for research, teaching and administration with processor specifications i7, i5 and i3. In addition, there are 40 units of workstation computers on computers room to support the modeling design. The computers can be accessed and used by student in computers room, library and in the laboratory. Wi-Fi and cable system internet can be found throughout the faculty area and can be accessed by students 24 hours. In order to achieve and maintain a satisfactory level of service, then the computer facility staff is encouraged to attend the trainings. Maintenance of computer facility is directly taken handled by the faculty.

The design of the new campus has been carried out by a Japanese consultant, and all safety and health standards have been fulfilled in the design process and in construction process (including removal of asbestos from the old buildings). Generally, the security system is implemented through the training for use of the equipment on campus such as extinguishers, hydrants, sirens and during the implementation of activities in the Laboratory. When the practical laboratory works is carried out, every student as participant in laboratory activity have to wear Lab coats, boots and helmets as a safety procedure.

After the whole construction works is completed, routine exercises for simulating the use of safety equipment including preparing evacuation maps will be conducted regularly.

For student activities, CESP facilitate with Student Association room, sports fields and research room for 4th year student with computer-based IT devices.

The facilities available in CESP are mostly new, therefore at this stage there is no urgency in current evaluation of the facilities, however, in the future all facilities should be

evaluated thoroughly for continuous improvement to keep up with the newer technology.

10.6. The stakeholder's feedback mechanisms are systematic and subjected to evaluation and enhancement

The feedback from the various stakeholders is used in order to improve and develop curriculum content and the expected learning outcomes of CESP. The feedback is used to improve and update the graduate competency in order to meet the job market demand.

All stakeholders were invited to the meeting/workshop to provide input for improvement and renewal curriculum. Inputs from the workshop and questionnaire results are not in conflict with government regulations forwarded to enrich the curriculum. As the process of feedback continuous from year to year, some improvement of the method should be introduced for more efficient process.

11. OUTPUT

11.1. The pass rates and dropout rates are established, monitored and benchmarked for improvement

Grade Point Average (GPA) is a criteria or standard used to determine student's academic performance. Data from students and their study performance (GPA) indicate that the teaching and learning process at the CESP is sufficient to improve the quality of students. An average of GPA for academic year 2011 to 2015 is 3.12 with the average of completed degree is 4.5 year as shown on Table 11.1. It is verified that the curriculum developed at CESP is appropriate for students learning process.

Table 11-1 GPA percentage of graduate

Academic Year	GPA Average	GPA percentage of graduate			Average of completed degree (year)
		< 2,75	2,75-3,50	> 3,50	
2011	3,10	1,15%	90,35%	8,50%	4.5
2012	3,13	2,52%	93,98%	3,50%	
2013	3,20	2,46%	91,16%	6,38%	
2014	3,20	3,87%	86,80%	9,30%	
2015	3,12	2,19%	93,41%	4,41%	
Average	3,12	2.4	91.1	6.4	

Regulations require that the first 2 years (first 4 semesters), the student should pass 48 credits with minimum GPA of 2.00; otherwise the student will dropout (DO). The regulations also require that students who are not able to complete the study in maximum of 14 semesters will also be expelled (DO). Some students changed the study program in the first year of study, while some students even repeat the entrance test with the aim of studying at different faculties. Dropout rate based on data (2008/2009 – 2014/2015) is around 9.07% to the total number of students as indicated on Table 11.2. Students who are facing the possibility of dropout have been identified earlier by the Vice Dean academic affair, and their names will be informed to Head of Department in order to be given more attention. In minimizing number of drop out, CESP monitors academic performance of student at every semester. The monitoring can be done by online (http://siak.unhas.ac.id/pasca/inc2/ipk_lihat.php). This website also can be accessed by student's parent.

Table 11-2 Dropout rate o f the last 7 academic years

Academic Year	Student number	% Drop out for	
		4 Semester	14 Semester
2008/2009	145	6.21	0
2009/2010	139	6.47	1.44
2010/2011	117	9.40	-
2011/2012	163	7.98	-
2012/2013	121	9.92	-
2013/2014	136	8.82	-
2014/2015	108	4.63	-
Average		7.63	1.44

Note: - ongoing

Additionally, CESP did benchmarking to the university (domestic and abroad). For domestic universities, CESP conducted benchmarking to Bandung Institute of Technology as one of the best universities in Indonesia, while for abroad universities; CESP did benchmarking to the universities in Japan through JICA assistance and facilities. Model of benchmarking was performed in the form of a brief visit to the university. Some academic staffs in CESP have followed short term for 3 and 6 months. Benchmarking aims to improve the academic quality which is associated with CESP management development, learning and research methods. The benchmarking results are used by CESP to improve and develop teaching methods which eventually could reduce dropouts.

11.2. The average time to graduate is established, monitored and benchmarked for improvement

Table 11.3 showing the average study period is 4.5 years. When compared with other study program in Engineering Faculty, the period of study in CESP is relatively shorter. The shortest study periods are held by Industrial Engineering and Informatics Study Program is 4.3 and 3.8 years respectively.

Table 11-3 Average study period and GPA Fiscal Year of 2013-2015

No.	Study Program	Average study period (year)	Average of GPA
1	Civil Engineering	4.5	3.12
2	Environmental Engineering	4.5	3.10
3	Mechanical Engineering	4.9	3.12
4	Industrial Engineering	4.3	3.26
5	Naval Engineering	5.7	3.08

No.	Study Program	Average study period (year)	Average of GPA
6	Offshore Engineering	5.4	3.14
7	Naval System Engineering	5.6	3.09
8	Electrical Engineering	4.5	3.26
9	Informatics Engineering	3.8	3.39
10	Architect	5.2	3.30
11	Planology	4.5	3.50
12	Geology Engineering	6.2	3.11
13	Mining Engineering	5.2	3.13
Average*		4.9	3.20

The reduced time of graduation is not separated from the results of benchmarking that has been done to some universities, particularly universities in Japan through the facilitation by JICA. LBE concept is one example of the benchmarking result, where the laboratory became a part of subject. Thus the study period could be shortened, because students no longer need to wait for laboratory work after they pass from the subject.

11.3. Employability of graduates is established, monitored and benchmarked for improvement

From tracking alumni which is performed each year, the waiting time for graduates to obtain employment is approximately 2.5 months. The short waiting time is caused by several factors including high demand of Civil Engineering graduate, good graduates performance, cooperation developed by CESP and alumni association to several local and national companies. Some companies give a chance to CESP through university or faculty to hold a recruitment test in their company, thus it is certainly a great opportunity for alumni to fill the vacancy. Similarly, an alumni association is actively preparing job information to the fresh graduate who strongly supports shortening the waiting period of CESP graduates to work.

11.4. The types and quantity of research activities by students are established, monitored and benchmarked for improvement

One of the strategies that CESP do in increasing the number of research students is to engage students in research and community service conducted by a faculty member. In the

academic year 2015/2016, about 265 students did final project through thesis. Some 170 students participated in academic staff research. The student research topics can be found in the appendix.

From the benchmarking results conducted by CESP, one of the shortcomings is that students of CESP today is lack independence in conducting research, they are still highly dependent on the supervisor. Hence to overcome this, CESP always encourages students to participate in various research competitions activities. Besides, CESP cooperate with student organizations to hold national competitions every year in the field of civil engineering. This is done to increase student interest and independence in conducting research.

11.5. The satisfaction levels of stakeholders are established, monitored and benchmarked for improvement

To monitor stakeholder satisfaction annually, CESP conducts survey of satisfaction of alumni performance. Approximately 20 stakeholders surveyed. The survey results in 2015 are as shown in the Table 11-4 below.

Table 11-4 Satisfaction survey of Alumni

No	Type ability	Users response				Follow up by study program
		Very good	Good	Enough	Less	
		(%)	(%)	(%)	(%)	
1	Integrity (ethic and attitude)	40.92	56.13	2.95	0.00	Maintaining/improving the quality of education, especially in the aspect of integrity by adding content of ethics and attitude in every subject.
2	Expertise based on science (professionalism)	33.48	61.15	5.38	0,00	Improving the quality of learning and knowledge development according to its competence.
3	English	11.12	39.5	41.2	8.18	Improvement usage of English in the learning process, such as tasks in English.
4	Information Technology	34.19	60.56	5.25	0.00	Improvement information networks through the website (http://eng.unhas.ac.id/si

		Users response				
						pil) and deployment process based on e-learning.
No	**Type ability**					**Follow up by study program**
5	Communication	44.13	50.43	5.44	0.00	Enhanced communication with the graduates, especially in terms of employment information and other sources of funding for academic activities.
6	Team work	52.32	45.27	2.42	0.00	Increasing the intensity of team work in the learning process based on SCL.
7	Self-development	57.35	38.38	4.27	0.00	Increasing in extracurricular activities, internships and entrepreneurship.

Based on survey results, showed that user feedback on the ability of alumni surveyed is “good” and “very good” (average of over 90%), except for English proficiency which is still below 90%. CESP always makes improvements and developments. The survey unfortunately did not include comparative study showing other university alumni.

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