Self-Assessment Report

BACHELOR IN MECHANICAL ENGINEERING

FACULTY OF ENGINEERING
UNIVERSITAS SEBELAS MARET

AUN-QA CRITERIA

1. Expected Learning Outcomes
2. Program Specification
3. Program Structure and Content
4. Teaching and Learning Approach
5. Student Assessment
6. Academic Staff Quality
7. Support Staff Quality
8. Student Quality and Support
9. Facilities and Infrastructure
10. Quality Enhancement
11. Output

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PART 1

INTRODUCTION

Universitas Sebelas Maret Surakarta

Working Inst. of ALumni = 88.89% in Multy-Nat. Company

Final Project at 2017 = 7.8 months

Student Complain: 32% Adm.; 19% Class room, 13% Course; 21% practice; 15% Final Project

Required Competencies: 25% leadership; 20% Communication; 16% language; 14% Eng.; 10% Attitude; 8% Report Skill; 7% Eng. software

Waiting period for Job = 80% < 6 months

registrant's strictness at 2017/2018 = 1:49.53

Period of Study at 2017/2018 = 4.7 year

Student Number at 2017/2018 = 306

Student Activities/ Competition = 11/year

Supporting Staff Librarian = 36; Lab. Staff = 8; IT Staff = 2; Adm. Staff = 3; Stud. Serv. = 3

PROGRAM SPECIFICATION
Bachelor in Mech. Eng.
Engineering Faculty
Sebelas Maret University

Final Award : S.T.
Year of Opr. : 1998-now
Credits/Semester : 144/8
Acred. BAN: A "Excellent"

Lecturer: 29 51.7% Ph.D; 20.6% Master; Ongoing Ph.D 27.6%

Academic Position: 10.3% Professor; 55.2% Ass. Prof.; 34.5% Senior Lecturer

Staff to Student Ratio at 2017/2018 = 1:10.5

FTE Staff at 2017/2018 = 25.57

FTE Student at 2017/2018 = 268.2

No. Publ./ Staff at 2017 = 2.13

Research Budget at 2017 = 4.327 M

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PART 2

AUN-QA CRITERIA

Universitas Sebelas Maret Surakarta

Grad. Profile:
become manager
at job due to his
Success in application
of Mech. Eng. expertise
and soft skill development

Graduate Attribute:
Have competency to apply Mech. Eng.
Foundation and Soft Skill for job

Capable to Apply Mech. Eng. Foundation

Capable to Apply Soft Skill

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UNS
UNIVERSITAS
SEBELAS MARET

1. Expected Learning Outcomes (ELO)

ABET
Accreditation Board for Engineering and Technology

KKNI
Indonesian National Qualification Framework

BKSTM
the board society of bachelor in mechanical engineering in Indonesia

ELO of **BME**

Program Educational Objectives (PEO)

PEO-1: Engineering foundation for success in:

- Technical careers in industry, government, research institution, educational institutions or engineering consultant.
- **Graduate school in engineering**
- **Careers involving management or entrepreneurship**

PEO-2: Soft skill for:

- Adapting to working world demands
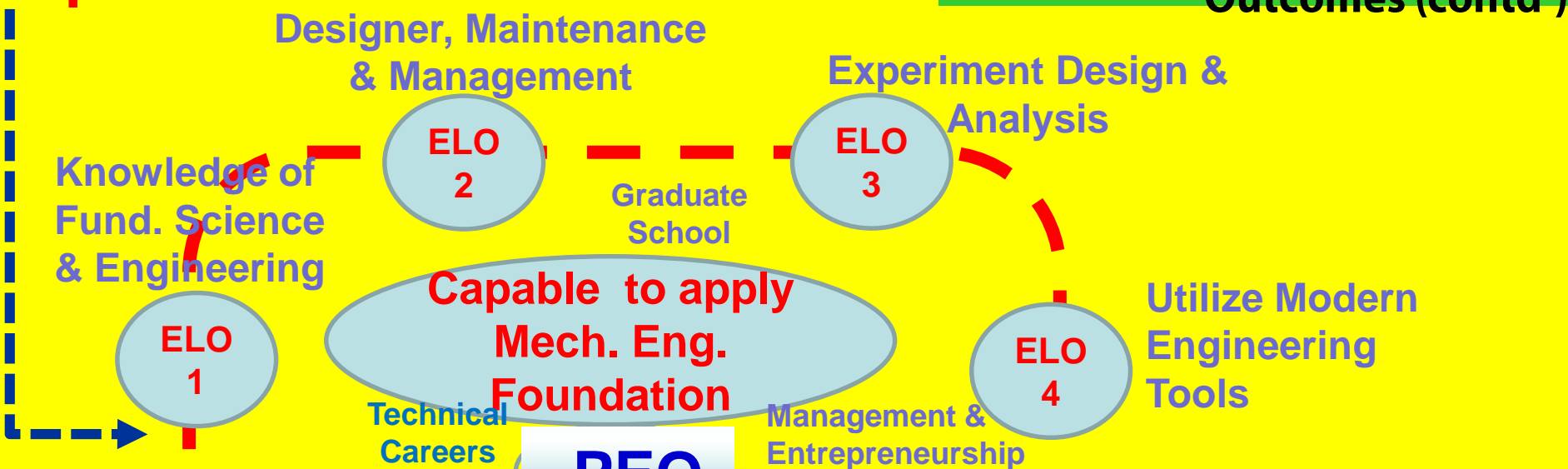- Developing new knowledge and skills

Specific ELO

Designer, Maintenance & Management

Experiment Design & Analysis

ELO 2

ELO 3

Knowledge of Fund. Science & Engineering

Graduate School

ELO 1

Capable to apply Mech. Eng. Foundation

Utilize Modern Engineering Tools

ELO 4

Technical Careers

Management & Entrepreneurship

PEO

Adapting in work

Develop. in knowledge & Skill

Good Communication

ELO 10

ELO 5

Capable to Apply Soft Skill

Long-life Learning

ELO 9

ELO 6

Competence as feedback
Leadership
Communication
English language skill
Engineering Analysis
Good Attitude
Presenting skill
Engineering Software

Ethi & Professionc

ELO 8

ELO 7

Individual & Team in Work

Knowledge of Contemporary issues

Entrepreneurship & Innovation

Generic ELO

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Vision

Becomes the prominent development center for science, knowledge, and art in the international level which is based on the noble values of the national culture.

M1.

Organizing the **education and teaching** that demand the self development of the lecturers and drive the self reliance of the students in acquiring **knowledge,**

M2.

Organizing the **researches**, which aim at the **new discoveries and inventions in the fields of science,**

M3.

Organizing the **community service activities** which are oriented to the efforts of **community**

	Expected Learning Outcome	Mission	Vision
ELO-1	Able to apply the knowledge of fundamental mathematics, basic science, and basic engineering, to identify, formulate, and complete the field of mechanical engineering	M1	r science, knowledge, and n the noble values of the
ELO-2	Able to design components, operate, manage, and maintain machinery and systems related to machinery	M1	
ELO-3	Able to design, carry out experiments, analyze and interpret data obtained	M2	

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3. Program Structure and Content

The linkages among the course and ELO are categorized into two types:

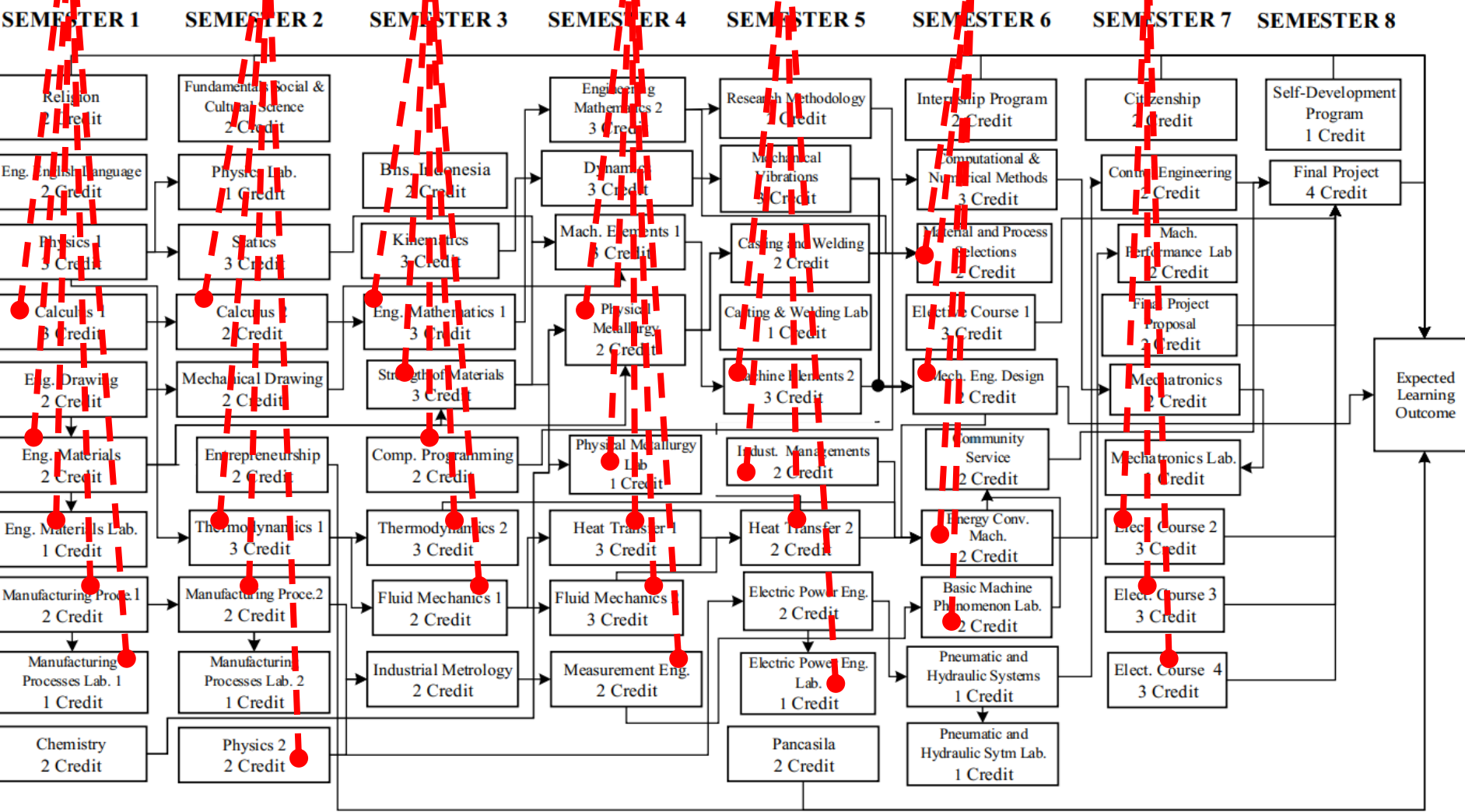- The first (**) is learned & assessed,
- the second (*) is delivered only.
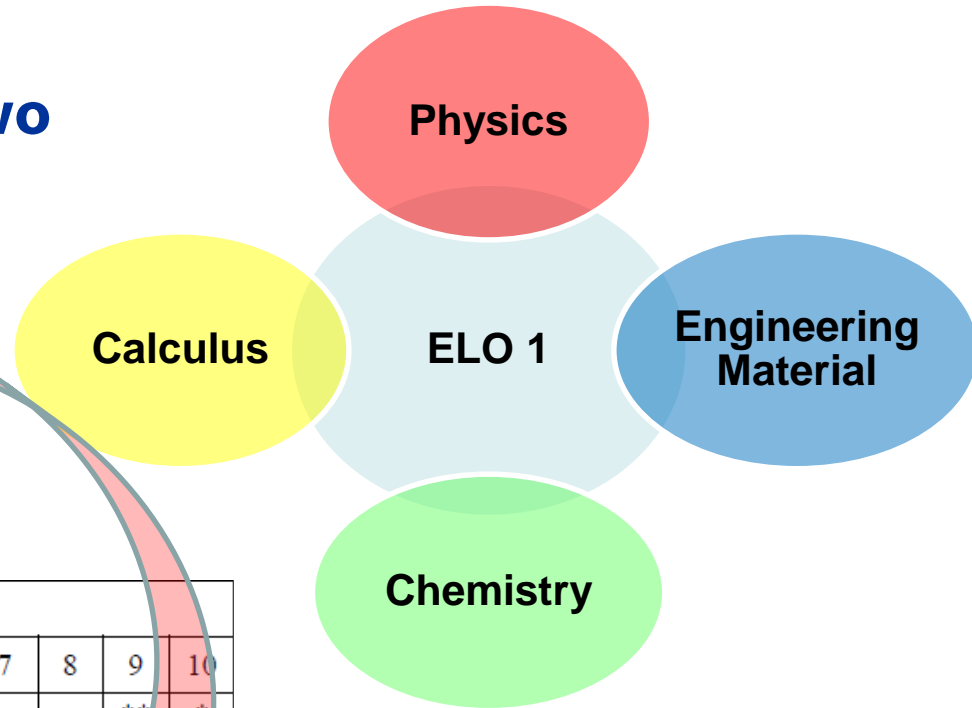
SEM.	COURSE	CREDIT	ELO 1	2	3	4	5	6	7	8	9	10
1	Religion	2									**	*
	Engineering English Language	2					**				*	*
	Physics 1	3	**			**		*			*	*
	Calculus 1	3	**			**	*		*		*	*
	Chemistry	2	**			**		*			*	*
	Engineering Drawing	2		**			**				*	*
	Engineering Materials	2	**		**		**				*	*

Physics

Calculus   ELO 1   Engineering Material

Chemistry

Relation between SLO dan ELO

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.....Mapping of ELO with Curriculum.....

5 Student Assessment

1. Fluid Mechanics 1:

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FACULTY OF ENGINEERING
BACHELOR PROGRAM IN MECHANICAL ENGINEERING

MID EXAM
Odd Semester - Academic Year 2017/2018

Subject/Credit	:	Fluid Mechanics 1 /3
Date	:	31 October 2017
Time	:	10.00 – 11.40
Place	:	203A, 203B, 303
Nature of Exam	:	Opened text book
ELO	:	- Able to apply the knowledge of fundamental mathematics, basic science, and basic engineering, to identify, formulate, and complete the field of mechanical engineering (CK1),
		- Able to design, carry out experiments, analyze and interpret data obtained (CK3),
		- Able to utilize methods, skills, and modern engineering tools required for engineering practice (CK4).
Lecturer	:	Dr. Budi Santoso, ST., MT.

%Weight

Alignment between assessment method & ELO

| Subject | - Written examination
- At least twice | ELO-1, ELO-2, ELO-3, ELO-4, ELO-7, ELO-8 |

| Laboratory Course | - Performance
- Report
- Oral test | ELO-1, ELO-2, ELO-3, ELO-4, ELO-5, ELO-6, ELO-9, ELO-10 |

| Internship | - Field Supervisor
- BME Supervisor
- Report
- Presentation | ELO-5, ELO-6, ELO-9, ELO-10 |

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All lecturers prepare learning plan
- course contribution to the ELO,
- achievement of the subject lesson,
- method of learning and,
- assessment
- Theoretical courses in a classroom at 16 times meeting per semester

learning method in the classroom
- discussion,
- task/self-employment, and
- presentation

Support:
- independent work,
- group assignment, and
- journal review, or
- elaborated to support the learning method

Laboratory course
purposes.
- To improve skills in engineering work,
- To do observations and measurements of phenomena

Research work
- proposal preparation,
- research report, and
- presentation of the results

Internship Program *and* Community Service
- explore independently from off-campus sources
- adapt to working conditions in industry or society

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Review of field study in BME curriculum

Material

Manufacturing

Energy

Basic Field

4 Elective Courses

Mechanical Design

Independent Academic Activities

Community Service

Internship Program

Self Development Program

Final Project Proposal

Final Project

Bachelor in Mechanical Engineering

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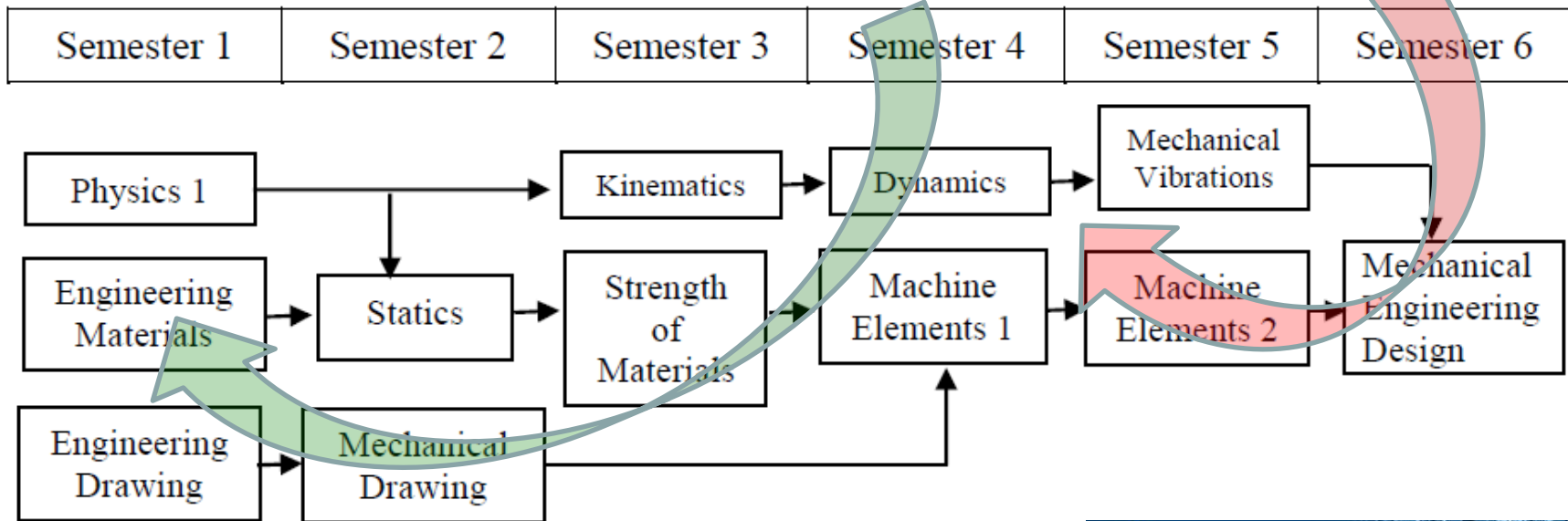Fakultas Teknik - Universitas Sebelas Maret

Integration of courses to obtain the ability in BME design

Each course in the BME curriculum is interconnected mutually

ELO is gradually
- achieved
- developed

general courses

core courses

Scored to be Self Development Program

- Student organization
- Competition
  - Student Creativity Program (PKM),
  - SEM, Singapore
  - FSAE, Japan
  - KRTI,
  - KKCTBN.

- involves in international seminar committees (ICESEAM 2015, ICESNANO 2016)

Student activity

Final Project

SOFTSKILL

Event

KKN (Community Services)

- ability to plan and carry out research
- ability to report

Entrepreneurship:
- build a broad business
- Knowledge
- entrepreneurship theory,
- attitude, mentality
- entrepreneurial,
- creativity,
- innovation

- 6 weeks stay
- sharpen social sense
- empathy to solve problems

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Academic Year	Types Of Publication				Total	No Publications Per Academic Staff
	Internal/ Institutional	National	Regional	International		
2013		4		4	8	0.27
2014		1		36	37	1.27
2015				39	39	1.34
2016	4	1		69	74	2.55
2017	11			51	62	2.13

Year	Number of research title	Total Budget (in million)
2013	19	Rp. 1723.
2014	23	Rp. 1822.
2015	25	Rp. 3713.0
2016	28	Rp. 3756.2
2017	26	Rp. 4327

>50% of FE
(+ Rp. 8100)

Institut Teknologi Bandung	28
Universitas Indonesia	27
Universitas Brawijaya	25
BME Universitas Sebelas Maret	14
Universitas Hasanuddin	13
Universitas Diponegoro	10

8. Student Quality and Support

selection methods

- SNMPTN,
- SBMPTN, &
- SM-UNS

integrated academic information

- the student academic performance,
- the courses plan,
- the grades,
- correspondence with the academic advisor,
- provides a warning system

Academic Year	Applicant		
	No. Applied	No. Offered	No. Admitted/Enrolled
2013/2014	3010	63	67
2014/2015	3609	62	67
2015/2016	3890	100	109
2016/2017	4756	100	116
2017/2018	4953	100	122

10. Quality Enhancement

Alumni
- Online
- Annual meeting
- questionnaire

+

Industries
- questionnaire

Curriculum
- Evaluate every 5 years
- The evaluation is finished before developing the new curriculum

Students
- Questionnaire
- who just completed

Weekly Meeting

Annual Meeting of TLP (Mid Year)

Annual Meeting of Program (End Year)

TLP

- Prepared before courses start
- Input in the OCW

mid semester students

- online assessment TLP
- Via Sijamut

end semester students

- online assessment of TLP
- Via Siakad

LPPMP
-Internal Audit
-Periodically

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11. Output

Academic Year	Cohort Size	% completed first degree in		% dropout during			
		4 Years	>4 Years	1st Year	2nd Year	3rd Year	4th Years & Beyond
2012	55	3.6%	58.1%	23.6%	2.5%	0%	0%
2013	59	16.9%	28.8%	25.4%	0%	0%	0%
2014	55			18.1%	0%	1.8%	
2015	82			13.4%	2.4%		
2016	77			12.9%			
2017	84						

(a) The waiting period to get a job

(b) Working Institution
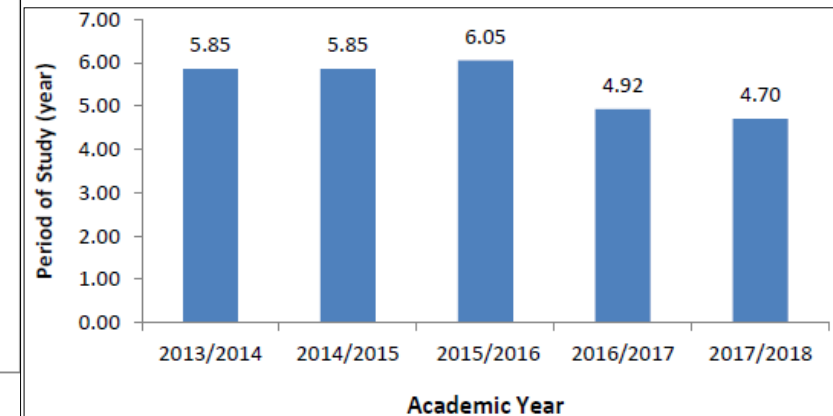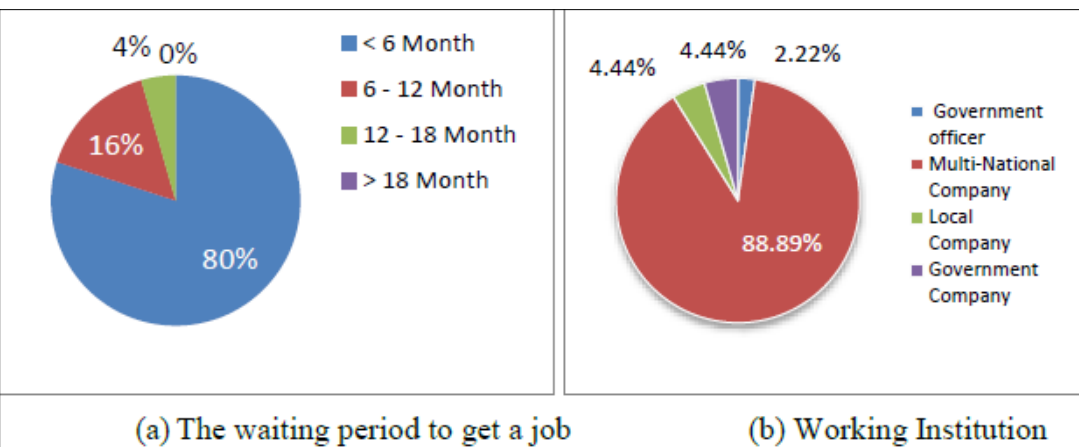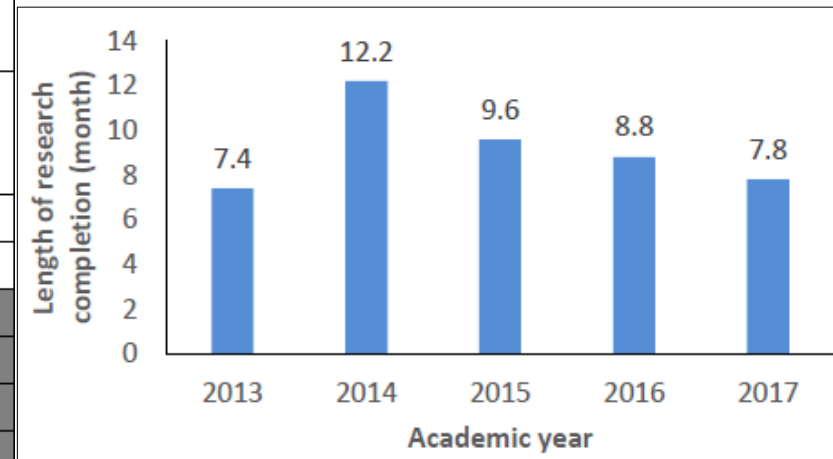
ACTIVITIES

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MATUR NUWUN
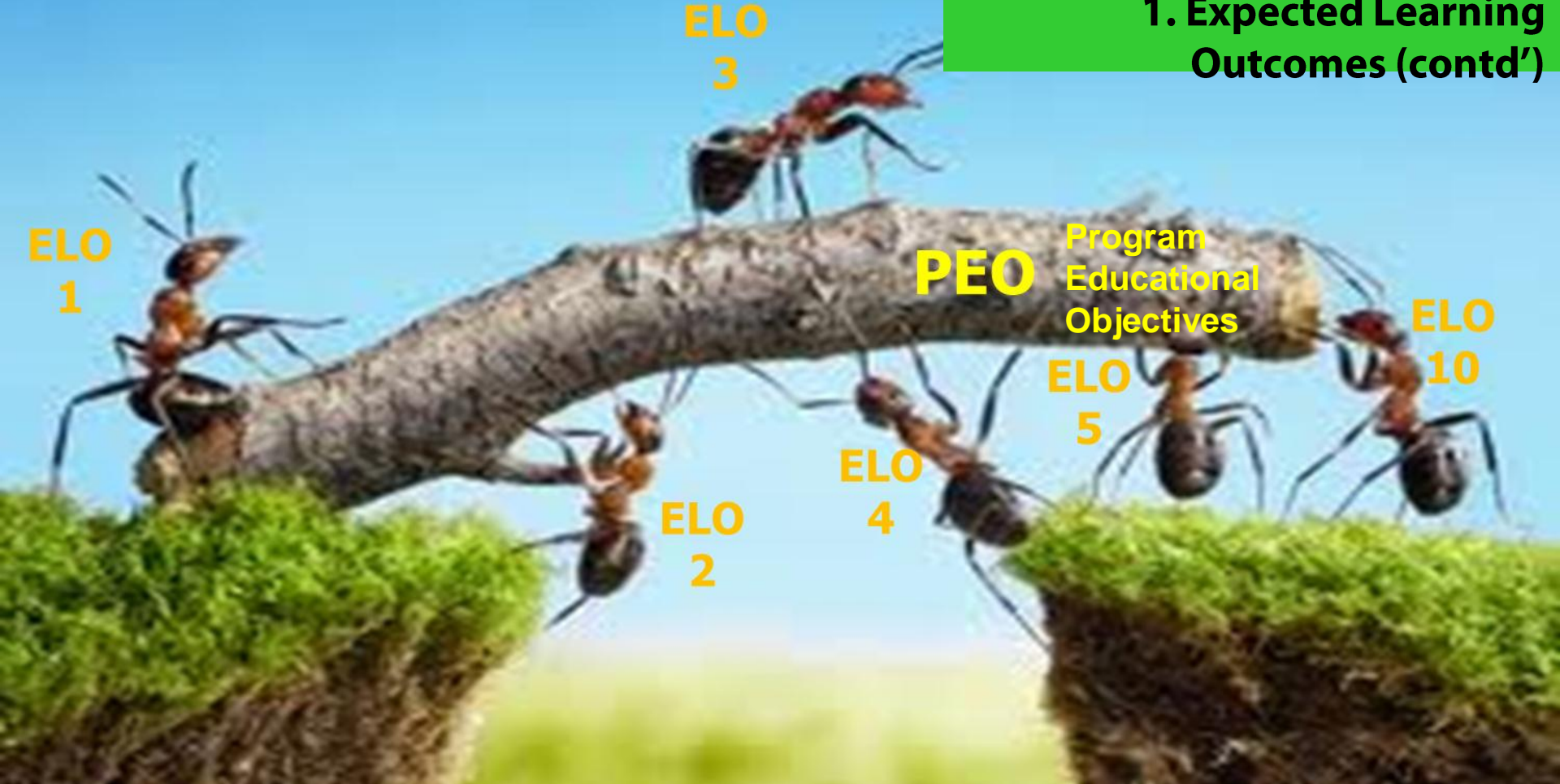
How "PEO" are compiled from "ELO" ?

6. Academic Staff Quality

- a rule regulating Rights and Obligations, Prohibitions and Sanctions, and Awards for outstanding academic staff

- All lecturers include into the retirement insurance program to ensure the welfare of lecturers in retirement.

- BME arrange staff-to-student ratio and lecturer workload to ensure the quality of TLP

- Implementation of TLP, research and service, at least 12 credits and a maximum of 16 credits.

9. Facilities & Infrastructure

Class → 7 classes area 456 m2 → - installed AC, - LCD projector, - covered Wi-Fi → - provided computer facilities - licensed software

Laboratories → 11 Lab + 2 UPT UNS Area 1839 m2 → Standard operating procedures (SOP)

Library → 1 5000 m2 area → Centralized In UNS 10 minutes by walk

internal information system → SIJAMUT academic services → to complementary SIAKAD

Safety and Health at Work (SH@W) → - Fire extinguishers /building - Security units → periodically train for fire handling

ELO 10

2 Courses   1 Courses   2 Courses   1 Courses   2 Courses

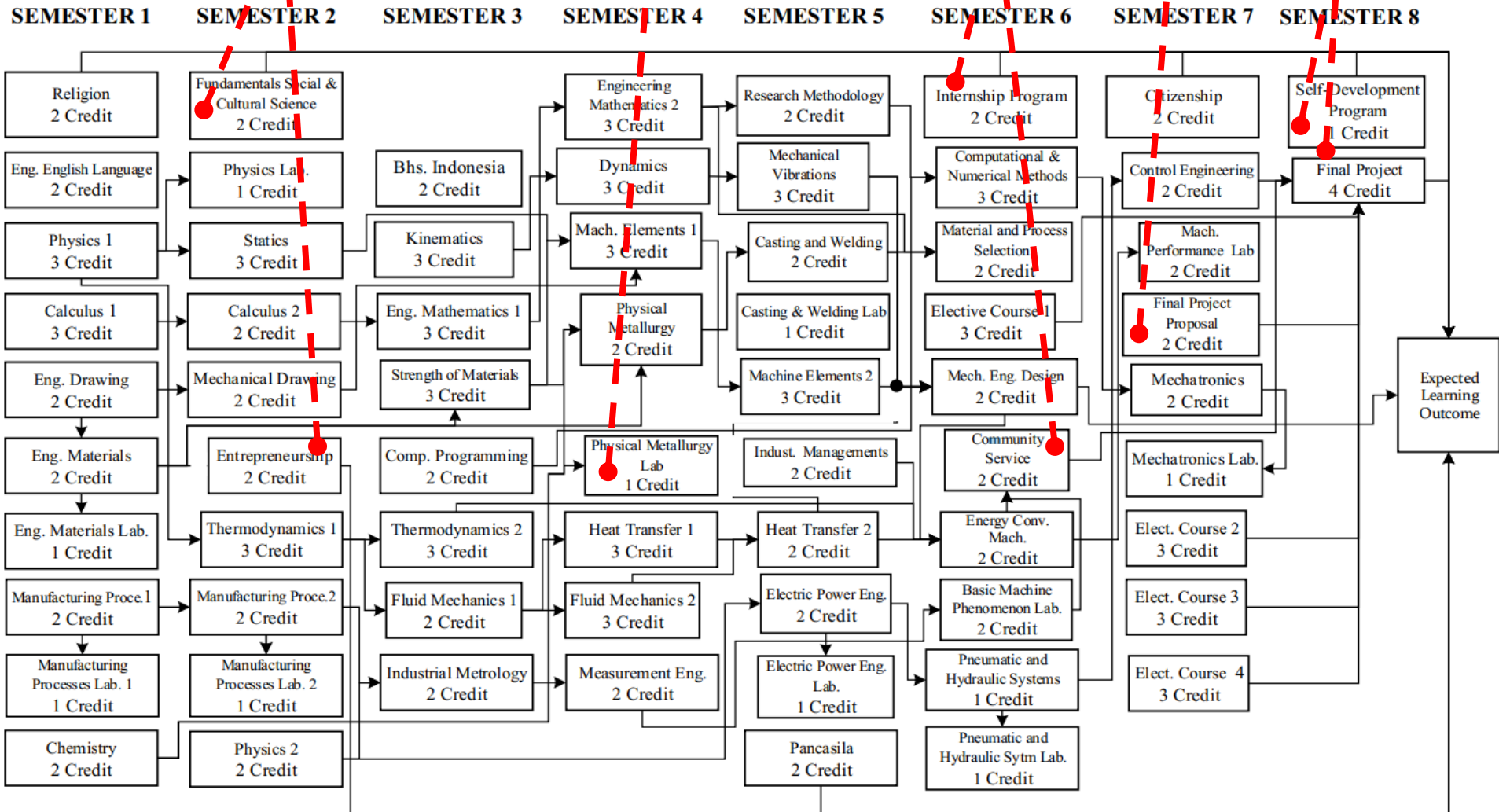| SEMESTER 1	SEMESTER 2	SEMESTER 3	SEMESTER 4	SEMESTER 5	SEMESTER 6	SEMESTER 7	SEMESTER 8
Religion 2 Credit	Fundamentals Social & Cultural Science 2 Credit		Engineering Mathematics 2 3 Credit	Research Methodology 2 Credit	Internship Program 2 Credit	Citizenship 2 Credit	Self-Development Program 1 Credit
Eng. English Language 2 Credit	Physics Lab. 1 Credit	Bhs. Indonesia 2 Credit	Dynamics 3 Credit	Mechanical Vibrations 3 Credit	Computational & Numerical Methods 3 Credit	Control Engineering 2 Credit	Final Project 4 Credit
Physics 1 3 Credit	Statics 3 Credit	Kinematics 3 Credit	Mach. Elements 1 3 Credit	Casting and Welding 2 Credit	Material and Process Selection 2 Credit	Mach. Performance Lab 2 Credit	
Calculus 1 3 Credit	Calculus 2 2 Credit	Eng. Mathematics 1 3 Credit	Physical Metallurgy 2 Credit	Casting & Welding Lab 1 Credit	Elective Course 1 3 Credit	Final Project Proposal 2 Credit	
Eng. Drawing 2 Credit	Mechanical Drawing 2 Credit	Strength of Materials 3 Credit		Machine Elements 2 3 Credit	Mech. Eng. Design 2 Credit	Mechatronics 2 Credit	Expected Learning Outcome
Eng. Materials 2 Credit	Entrepreneurship 2 Credit	Comp. Programming 2 Credit	Physical Metallurgy Lab 1 Credit	Indust. Managements 2 Credit	Community Service 2 Credit	Mechatronics Lab. 1 Credit	
Eng. Materials Lab. 1 Credit	Thermodynamics 1 3 Credit	Thermodynamics 2 3 Credit	Heat Transfer 1 3 Credit	Heat Transfer 2 2 Credit	Energy Conv. Mach. 2 Credit	Elect. Course 2 3 Credit	
Manufacturing Proce.1 2 Credit	Manufacturing Proce.2 2 Credit	Fluid Mechanics 1 2 Credit	Fluid Mechanics 2 3 Credit	Electric Power Eng. 2 Credit	Basic Machine Phenomenon Lab. 2 Credit	Elect. Course 3 3 Credit	
Manufacturing Processes Lab. 1 1 Credit	Manufacturing Processes Lab. 2 1 Credit	Industrial Metrology 2 Credit	Measurement Eng. 2 Credit	Electric Power Eng. Lab. 1 Credit	Pneumatic and Hydraulic Systems 1 Credit	Elect. Course 4 3 Credit	
Chemistry 2 Credit	Physics 2 2 Credit			Pancasila 2 Credit	Pneumatic and Hydraulic Sytm Lab. 1 Credit		

....That is similar with the other ELOs…

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Category	M	F	Total		Percentage PhDs
			Headcount	FTEs	
Professor	3		3	3.58	100% (3)
Associate/Assistant Professors	13		13	14.41	75% (9)
Full-time Lecturers	7		7	7.58	43% (3)
Part-time Lecturers					
Visiting Professor/Lecturers					
Total	23		23	25.57	

Academic Year	Total FTEs of Academic staff	Total FTEs of Students	Staff to Student Ratio
2012/2013	23.75	192.77	1 : 8.1
2013/2014	23.08	182.98	1 : 7.9
2014/2015	24.09	203.43	1 : 8.4
2015/2016	28.57	235.83	1 : 8.2
2016/2017	22.62	245.05	1 : 10.8
2017/2018	25.57	268.2	1 : 10.5

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BME academic guidebook and website

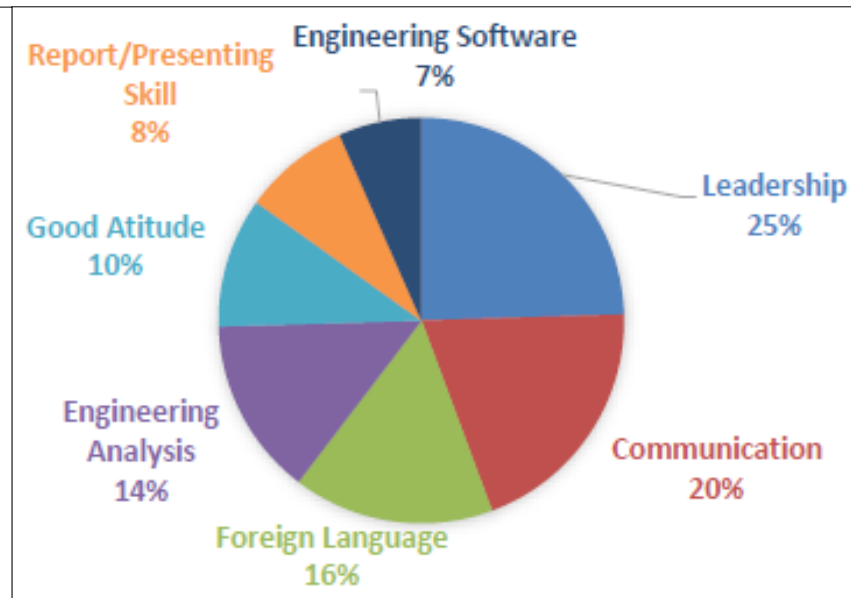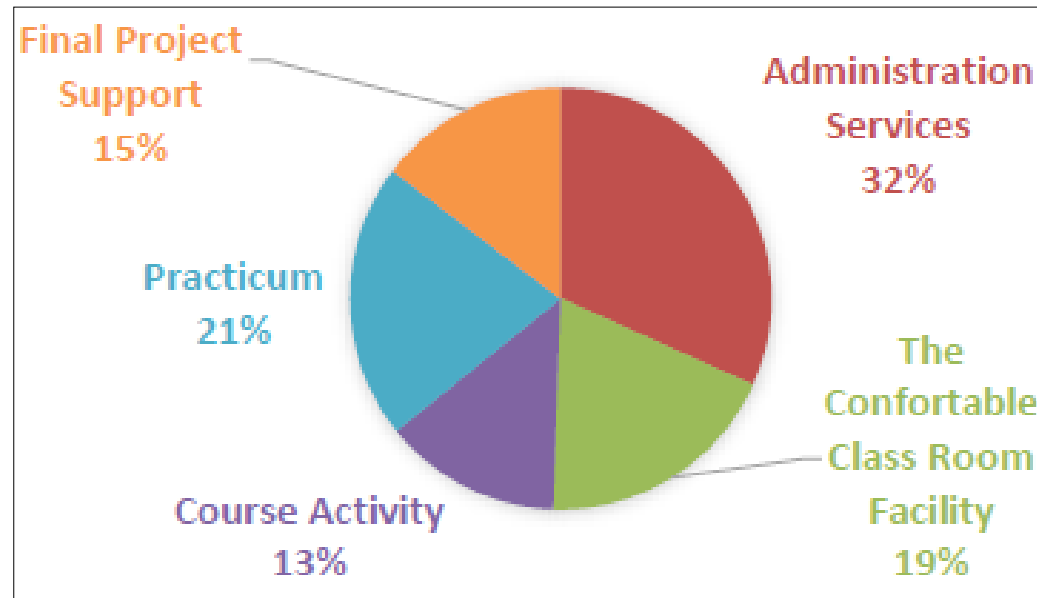|		

Consist:
- program specification
- comprehensive course
    - List of Course
    - Course description
        - semester,
        - number of credits,
        - learning achievement,
        - syllabus,
        - assessment, and
        - reference book
	regularly updated to reflect the changes	**distributed**
		to all new students
		at the **beginning of the semester**

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The required competencies in a work environment based on polling from alumnus

Student complaints based on services category