

REPORT

**THE 2014 CURRICULUM PUBLIC TEST
ELECTRICAL ENGINEERING EDUCATION
STUDY PROGRAM**



**FACULTY OF ENGINEERING
YOGYAKARTA STATE UNIVERSITY
2015**

A. RATIONALE

Curriculum evaluation and review is a strategic activity in order to develop and improve the quality of education in the Electrical Engineering Education study program. Murray Print said that a curriculum must always be reviewed to keep it updated. The main reason, according to Murray Print, is that a curriculum plays a critical role in improving the quality of education.

The foundation of a curriculum lies in its values and beliefs about what students have to know and how they can obtain and master that knowledge. The curriculum must also be packaged in a form that can be easily communicated to parties involved in educational institutions, open to criticism and easily put into practice. The curriculum evaluation and review need to be carried out to determine the impact of the implementation of the *BKI* curriculum. After evaluating and reviewing the curriculum, the next step is public test. The public test functions as a means of socialization and obtaining the views of several stakeholders.

The challenges brought about by the development of science and technology continuously motivate changes and adjustments to the curriculum. Likewise, the development of the needs of the community and stakeholders helped encourage the curriculum development.

B. OBJECTIVES

1. Knowing the opinions of the education community and the industrial community in analyzing the 2014 curriculum of the Electrical Engineering Education Study Program.
2. Improving the 2014 curriculum of the Electrical Engineering Education Study Program, Faculty of Engineering, Yogyakarta State University.

C. IMPLEMENTATION

The curriculum public test of the Electrical Engineering Education Study Program took place in the Center for Science and Technology Empowerment (PUSDATEK) Room, Vocational and Technical Education Laboratory (LPTK) Building 1st floor, Faculty of Engineering, Yogyakarta State University on Thursday, November 26, 2015, starting from 9 a.m. until finished.

D. PUBLIC TEST PARTICIPANTS

The following is a list of public test participants from the stakeholders:

Table 1. The list of public test participants from stakeholders

No	Name	Origin of Institution/ Company
1.	Bambang Irianto, M.Pd	State Vocational High School 2 Depok
2.	Drs. Winih Wicaksono, M.T	State Vocational High School 3 Yogyakarta
3.	Siti Rahmah	State Vocational High School 2 Pengasih
4.	Budi Trenggono, S.Pd.T	State Vocational High School 1 Tembarak
5.	Yuniah Rosianah, S.Pd	State Vocational High School 1 Purworejo
6.	Herdani Julian	Robota School
7.	Heskiawan	SMC LLC.
8.	Hafid Herdianto	CV. Smart Brain
9.	Yon Fakhunal Huda, M.Eng	State Vocational High School 2 Depok
10.	Drs. Suroto	State Vocational High School 2 Depok

The following is a list of public test participants from internal parties:

Table 2. The list of public test participants from internal parties

No	Name	Study Program
1.	K. Ima Ismara, M.Pd. M.Kes	Electrical engineering education
2.	Drs. Sunomo, M.T	Electrical engineering education
3.	Dr. Haryanto, M.Pd. M.T	Electrical engineering education
4.	Herlambang Sigit P.,	Electrical engineering education

	M.Cs	
5.	Rustam Asnawi, M.T,	Electrical engineering education Ph.D
6.	Sigit Yatmono, M.T	Electrical engineering education
7.	Ariadie Chandra N.,	Electrical engineering education M.T
8.	Andik Asmara, M.Pd	Electrical engineering education

E. PUBLIC TEST INSTRUMENTS

The questions arranged in the instrument for assessing the 2014 Curriculum are as follows:

1. Questionnaire title: “The assessment sheet of the study program curriculum”.
2. Fill-in form instructions.
3. Curriculum identities, consisting of the contents of study programs, departments and faculties.
4. Reviewer identities, consisting of full name, institution and position.
5. Assessment sheets of the main aspects of the curriculum, starting with the Study Program Vision. It contains following questions:
 - a. The clarity of the study program's vision statement.
 - b. The realistic formulation of the study program's vision.
6. Assessment sheets of the main aspects of the curriculum relating to the profile of graduates. It contains following questions:
 - a. The profiles reflect the role or function of graduates in accordance with the disciplines or expertise in the study program.
 - b. The formulation of the profiles is clearly described in accordance with the disciplines or expertise in the study program.
7. Assessment sheets of the main aspects of the curriculum concerning learning outcomes. It consists of several questions as follows:

- a. The completeness of description elements (attitudes and values, general knowledge, special skills and general skills).
 - b. The appropriateness with the qualification level (for example, level 6 is the undergraduate level).
 - c. The clarity of the boundaries of the discipline/expertise in the field of study.
 - d. The level of mastery, depth, and breadth of the study materials that must be learned.
 - e. The clarity of the formulation.
8. Assessment sheets of the main aspects of the curriculum concerning the curriculum structure. It contains several questions as follows:
- a. Each credit weight is proportional (University Courses and Basic Educational Courses are worth 20 credits, Faculty Courses are 12 credits and Study Program Courses are worth 104 credits).
 - b. The University Courses and Basic Educational Courses reflect YSU vision.
 - c. The Faculty Courses reflect the disciplines/expertise in the faculty.
 - d. The Study Program Courses reflect the vision and the disciplines/expertise in the study program.
 - e. The course description contains the breadth and depth of teaching materials.
 - f. The determination of courses per semester is serial and/parallel
 - g. The maximum number of courses in a semester is 24 credits.
 - h. The learning guidance contains aspects of student activities according to sub-learning outcomes and the use of learning methods centered on student activity.
 - i. The assessment guidance contains assessment objectives, assessment techniques and achievement criteria or competency completeness.
9. Other suggestions related to the 2014 curriculum

10. The conclusions drawn from the review of the 2014 curriculum.

F. PUBLIC TEST RESULTS

The following are the results of the public test that can be summarized by each question point from 10 public test participants:

Point 5a: The clarity of the study program's vision statement.

No	Answers	Number of Answers
1.	Clear/Good	6
2.	Excels at the international level and the national level	2
3.	Sharpened to: in 2025, the study program will be excellent at national and international levels, and produce pious, autonomous, and intellectual graduates.	1
4.	The study program's vision is less clear because it is still too broad	1

Point 5b: The realistic formulation of the study program's vision.

No	Answers	Number of Answers
1.	Realistic/Good	7
2.	In sequence	1
3.	Very realistic to be realized in 2025 because currently the Department of Electrical Engineering Education functions in various fields (instructors, educators, technicians).	1
4.	The formulation of the study program's vision is realistic but between the vision and mission, there are still some that are not sustainable, especially for the point of creating conscience graduates as it is not yet appeared on the mission.	1

Point 6a: The profiles reflect the role or function of graduates in accordance with the disciplines or expertise in the study program

No	Answers	Number of Answers
1.	Clear/Appropriate/Good	7
2.	Appropriate but still limited to one study program so it needs to be developed in more than one study programs.	1
3.	Profile no 3 is not reflected in the curriculum.	1
4.	No answer	1

Point 6b: The formulation of the profiles is clearly described in accordance with the disciplines or expertise in the study program.

No	Answers	Number of Answers
1.	Clear/Appropriate/Good	6
2.	1) The word "as" needs to be added because there are words “role and function.” 2) The formulation is good.	1
3.	The formulation of the manuscript is more fitting than in the curriculum book.	1
4.	No answer	2

Point 7a: The completeness of description elements (attitudes and values, general knowledge, special skills and general skills).

No	Answers	Number of Answers
1.	Complete/Appropriate/Good	8
2.	Please assess attitudes of concern especially in engineering because this is a major problem in vocational high schools	1
3.	No answer	1

Point 7b: The appropriateness with the qualification level (for example, level 6 is the undergraduate level).

No	Answers	Number of Answers
1.	Appropriate/Good	7
2.	Pedagogical qualification = level 6 2) Engineering qualification = level 5	2
3.	No answer	1

Point 7c: The clarity of the boundaries of the discipline/expertise in the field of study.

No	Answers	Number of Answers
1.	Clear	9
2.	No Answer	1

Point 7d: The level of mastery, depth, and breadth of the study materials that must be learned.

No	Answers	Number of Answers
1.	Clear/Appropriate/Sufficient	6
2.	Qualification level 6 is already sufficient	1
3.	The level of mastery, depth, and graduation of study materials are in accordance with the study program.	1
4.	No Answer	2

Point 7e: The clarity of formulation

No	Answers	Number of Answers
1.	Clear/Good	7
2.	It is necessary to clarify the limits on the depth of lecture time for technical sketching: more emphasis is placed on interpreting technical sketching, not on sketching techniques itself.	1
3.	The formulation of learning achievements is less clear because it still	1

uses unnecessary words.

4. No answer 1

Point 8a: Each credit weight is proportional (University Courses and Basic Educational Courses are worth 20 credits, Faculty Courses are 12 credits and Study Program Courses are worth 104 credits).

No	Answers	Number of Answers
1.	Appropriate/Complete/Proportional	7
2.	Some credit descriptions (T, P, L, J) need additional information below them.	1
3.	No answer	2

Point 8b: The University Courses and Basic Educational Courses reflect YSU vision.

No	Answers	Number of Answers
1.	Proportional	7
2.	1) The weight of the microcontroller needs to be increased to 3 credits, considering the extent of 8 kinds of microcontroller and interface 2) Sensors & transducers are replaced by sensors and actuators	1
3.	No answer	2

Point 8c: The Faculty Courses reflect the disciplines/expertise in the faculty.

No	Answers	Number of Answers
1.	Appropriate	9
2.	No answer	1

Point 8d: The Study Program Courses reflect the vision and the disciplines/expertise in the study program.

No	Answers	Number of Answers
1.	Clear/Appropriate/Agree	8
2.	No answer	2

Point 8e: The course description contains the breadth and depth of teaching materials.

No	Answers	Number of Answers
1.	Clear/Appropriate/Agree	7
2.	1) Data communication and interfaces are added to Interface courses. 2) Energy conversion is more specific to renewable energy.	1
3.	No answer	2

Point 8f: The determination of courses per semester is serial and/parallel

No	Answers	Number of Answers
1.	Good/Appropriate/Agree	7
2.	Serial, Practices can be held parallel adjusted to the available facilities and infrastructure.	1
3.	No answer	2

Point 8g: The maximum number of courses in a semester is 24 credits.

No	Answers	Number of Answers
1.	Good/Appropriate/Agree	6
2.	The highest number is still below the maximum limit of 24, namely 22 credits.	1
3.	No answer	3

Point 8h: The learning guidance contains aspects of student activities according to sub-learning outcomes and the use of learning methods centered on student activity.

No	Answers	Number of Answers
1.	Good/Appropriate/Complete	6
2.	Learning methods have not been written in detail (perhaps because it has too many methods) and need to include examples of the planned methods.	1
3.	No answer	3

Point 8i: The assessment guidance contains assessment objectives, assessment techniques and achievement criteria or competency completeness.

No	Answers	Number of Answers
1.	Proportional/Appropriate/Good	6
2.	Attitude assessment, in particular, is of concern to be formulated	1
3.	No Answers	3

Point 9: Other suggestions

No	Answers	Number of Answers
1.	Although the course description is implicit, the aspects of learning (point 18) and aspects of assessment (point 19) have not been clearly shown in the curriculum documents reviewed. It would be better if these aspects were formulated clearly and explicitly in the curriculum document.	1
2.	The data acquisition and control practice subjects were replaced by SCADA system practice, for the following reasons: 1) It is more familiar to Business and Industrial World 2) It is linear with subjects in Vocational High School 3) It is more recognizable for the requirements for teacher certification to teach using SCADA system.	1
3.	1) There needs to be a "learning design" course so that graduates are able to plan the learning process well so it is synchronized with	1

	microteaching and educational assessment	
	2) Supporting courses need to be carried out with field courses such as observing processes that can replace most mechanical technology course material.	
4.	In the years 2020-2030, it is estimated that there will be a shortage of educators. For that reason, student competences in micro teaching and educational apprenticeships is added (credits are added), at least 4 credits for internships	1
5.	1) Balance the mechanical, electronic and informatics proportions. 2) Computer Basic 3) Computer technology	1
6.	1) Basic computer: computer programming practice is replaced by Algorithm I (basic programming). In the next semester, there is an algorithm II course (Smart control / Fuzzy). 2) For Electronic Technology - Data control and acquisition practices are renamed SCADA practices. 3) The practice of computer programming is added with the practice of making software (using vb, delfi, etc.).	1
7.	The number of credits in practical courses is greater than that in theoretical subjects (eg 75%: 25% or 60%: 40%) by referring to the needs of teachers who are competent in their fields so they are able to better guide the students.	1
8.	1) In order to make the department known internationally and nationally, especially in the industrial world, electronic and other media can be used. 2) In order to make the output of the electrical engineering study program is better known and quickly distributed to provide generation / technicians in the industry and vocational schools as educators or instructors.	1
9.	CNC courses need to be added, microteaching needs to be added, especially teaching elementary and junior high school students, as those students have begun to recognize the world of simple robotics and electronics.	1

10.	No answer.	1
-----	------------	---

Point 10: Conclusion

No	Answers	Number of Answers
1.	In general, the curriculum documents reviewed were in accordance with the planned vision and mission. In addition, the reviewers also argued that the curriculum aspects were in accordance with the conditions experienced by the reviewers as stakeholders in the VHS of Electrical Power Engineering.	1
2.	1) Technical drawing = need to emphasize the self interpretation of mechanical drawing 2) Mechanical technology: it should be focused on mechanical transition system 3) There is a need for learning design courses	1
3.	In general, The draft of the 2014 curriculum of Electrical Engineering Study Program is already feasible to use.	1
4.	Level 5 effectiveness test certificates are required to support the profile of industrial technicians.	1
5.	Overall, the existing curriculum is still relevant to be implemented.	1
6.	The 2014 curriculum is appropriate to be implemented by considering the above suggestions.	2
7.	The vision and mission are appropriate; the formulation of graduate profile is appropriate.	1
8.	No answer.	2

APPENDIX-1

DOCUMENTATION





Stakeholder Input for Curriculum Evaluation

CURRICULUM EVALUATION SHEET

ELECTRICAL ENGINEERING EDUCATION STUDY PROGRAM

INSTRUCTIONS:

1. Before evaluating the curriculum, read and review the curriculum in detail.
2. Describe the quality of the curriculum aspects assessed in the column provided.
3. This assessment is qualitative and open

Curriculum identity

1. Study program: **Electrical Engineering Education**
2. Major : **Electrical Engineering Education**
3. Faculty : Faculty of Engineering
4. **Yogyakarta State University**

Reviewer identity

1. Name : Drs. Winih Wicaksono, MT.
2. Institution : State Vocational High School 3 Yogyakarta
3. Position : Teacher

1. The substance of the main aspects of the curriculum

No.	Aspects of assessment	The empirical conditions of the study program curriculum
	Study program vision	
1.	The formulation of the vision is clear	Appropriate
2.	The formulation of the vision is realistic	Realistic

No.	Aspects of assessment	The empirical conditions of the study program curriculum
	Profile	
3.	The profile reflects the role or function of the graduates according to the disciplines/expertise in the study program	Not specific
4.	The profile formulation is clearly described according to the role or function of the graduates in the disciplines/expertise in the study program	The graduate profile in points c, d, and e should be eliminated. This is to provide evidence that the vision and mission focus on two things, i.e. educators in vocational high schools or instructors in industry. Even though there are educators, technicians, and laboratory staff, they are just casuistic. It seems very irrelevant when a graduate of electrical engineering education becomes an educational service staff while the rights and obligations inherent in his scholarship are being an educator.
	Learning outcomes	
5.	The completeness of description elements (attitude and values, general knowledge, special skills, and general skills)	Complete
6.	The suitability of the qualification level (for example, level 6 is bachelor)	Not appropriate
7.	The clarity of boundaries of disciplines/expertise in the study program	This is still not focused. It can be explained as follows: Based on the data from http://datapokok.ditpsmk.net/ , in 2016, the number of VHS (Vocational High School) of Electrical Engineering is 906, consisting of 8

No.	Aspects of assessment	The empirical conditions of the study program curriculum
		<p>expertise packages. From those packages, there were 580 VHS of Electrical Installation and Utilization Engineering, 238 VHS of Electrical Power Engineering, and 83 VHS of Industrial Automation Engineering, 70 VHS of Refrigeration and Air Conditioning Engineering, 12 VHS of Electrical Power Plant Engineering, 10 VHS of Electrical Power Network Engineering, 7 VHS of Distribution Engineering and only 1 VHS of Transmission Expertise Engineering in Indonesia.</p> <p>Based on the distribution of courses, it looks like it aims to reach more than 2 competencies even though it finally cones on 2 choices, i.e. Electric Power Engineering and Industrial Automation Engineering, and that is already appropriate. Thus, the distribution of courses should be directed at both competencies.</p> <p>Based on my observations and empirical experience in the field (in this case at school), not all of these courses can be taught and are in accordance with the current curriculum (the 2013 curriculum). This can be explained based on the description of courses, such as the relevance of English courses, and Computer Networking Practices. Electrical Power Protection Practices is taught in two semesters (IV and V) and is more directed to the expertise package of Distribution Engineering and Transmission Engineering, except the protection of MDP, SDP and load, and protection of Lighting Installation and Motor Installation. Industrial Management is also lacking the core competencies of</p>

No.	Aspects of assessment	The empirical conditions of the study program curriculum
		Electrical Engineering Education graduates. Likewise, the Transmission and Distribution Engineering course should tend towards its distribution, especially Switchgear.
8.	The level of mastery, depth, and breadth of study material that must be mastered	Because the aspect mentioned in No.7 is distributed to more than two competencies, I think the depth of mastery is lacking. Where will the Electric Power Plant Engineering curriculum be directed? Is it Electrical Installation and Utilization Engineering, Electrical Installation Engineering, Transmission Engineering, Distribution Engineering, or Electrical Power Plant Engineering?
9.	The clarity of formulation	The formulation of achievement aspects is complete, but needs to be compressed so it does not seem to aim too high and to make it more focused instead, so the professional vision becomes more achievable.
	Curriculum structure	
10.	The curriculum structure of the study program includes University Courses, Basic Educational Courses, Faculty Courses, and Study Program Courses.	The structure has had the value of Teacher Training Institution.
11.	The credit of each course cluster (University Courses and Basic Educational Courses weigh 20 credits, Faculty Courses weigh 12 credits, and Study	If there is still room for negotiation, University Courses, Basic Educational Courses and Faculty Courses should be reduced, because the weight is already 22% of the total curriculum credits. If it cannot be negotiated, then the choice is to focus on where the graduates will be directed, this can be based on empirical data on the number of schools, the type of

No.	Aspects of assessment	The empirical conditions of the study program curriculum
	Program Courses weigh 104)	expertise packages available and the highest percentage of tracer alumni.
No.	Assessment Aspect	Empirical Condition of Study Program Curriculum
12	University and Basic Educational courses reflect YSU goals	Yes
13	Faculty courses reflect the expertise programs of the faculty	Yes
14	Study program courses reflect the YSU vision and the discipline	Good and it will be better to reformulate the course list based on graduate profiles and the job requirements.
15	Course description contains the scope of analysis	The description should be in narratives. Each point in each sub materials should reflect the courses.
16	The courses determined in each semester are parallel or in series	The courses should be in series, so the materials may be well understood.
17	The number of courses in each semester is 24	The facilities for conducting theory and practicum courses helps the conduction of 24 credit-learning, yet the lectures should be optimally conducted.
18	The lectures' rule of conduct should involve student activities which are in line with the sub-learning objectives. The learning methods used in lectures focus on students' participation.	Good. The study program should pay attention to the nine revised aspects.
19	The rules in assessing include the objectives of	Basic principles do exist, but especially for the completeness criteria in vocational high schools, there

No.	Aspects of assessment	The empirical conditions of the study program curriculum
	assessment, assessment techniques, and achievement criteria.	should be minimum completeness criteria for each course. Those criteria should be based on the analysis of raw input, the facilities, and each course level of difficulty.

Other Suggestions:

Competences that need to added:

Developing teacher’s book. It is important since one of the teacher’s assessment components is based on teacher’s book. The book is on work plan, target, and evaluation done in the end of semesters.

Developing practicum book. The book includes practicum materials and those materials should have been tried out.

Developing interactive learning media. If teachers are not able to develop their own media. They should at least write a scenario of their teaching in a semester and consider which materials should be presented with or without any learning media.

Developing educational aids. More learning aids need to be developed because they usually are lacking in facilities.

Conclusions:

1. The curriculum should focus on the output, so the process may be better designed.
2. Professionals should focus on a discipline only.
3. Most academic staff have good social status. The curriculum developers and lecturers should put some credits on professionalism. At last, professionals should be supported to focus only on a specific discipline that they have chosen (Industrial Automation Engineering and Electrical Engineering).

Yogyakarta, November 12, 2016

(Drs. Winih Wicaksono, MT.)

CURRICULUM EVALUATION SHEET

ELECTRICAL ENGINEERING EDUCATION STUDY PROGRAM

Guidelines

1. Before evaluating the curriculum, please analyze and read the curriculum in detail.
2. Please describe the qualities of assessed curriculum aspects in the table provided.
3. It is a qualitative and open evaluation.

Curriculum Identity

1. Study Program: Electrical Engineering Education
2. Department: Electrical Engineering Education
3. Faculty: Engineering
4. University: Yogyakarta State University

Reviewer Identity

1. Name : Drs. Suroto
2. Institution: Vocational High School SMK Negeri 2 Depok, Sleman
3. Position: Vice Principal for Curriculum Affairs

1. Main Aspects of the Curriculum

No.	Assessment Aspect	Empirical Condition of the Study Program Curriculum
	Study Program Vision	
1	The vision is clearly formulated	By 2025, to be an outstanding and competitive Electrical Engineering Study Program in the international level in producing teachers who are pious, independent, intelligent...

No.	Assessment Aspect	Empirical Condition of the Study Program Curriculum
2	The vision is rational	Yes
	Profile	
3	The profile reflects the role or graduate function in accordance with the discipline and expertise	Yes
4	The profile clearly describes the roles and functions of the graduates	Yes
	Learning Outcomes	
5	The completeness of description element (attitude, value, common knowledge, specific skills, and general skills)	When observed during observation and Field Teaching Practice programs as well as the process of applying for a teacher job. The graduates do not talk, dress, and behave properly.
6	The conformity of the qualification levels (level 6: bachelor's degree)	Yes
7	The clarity of each discipline limitation	Yes
8	The level of mastery, expertise, and the range of the discipline	Yes
9	The clarity of formulation	Yes
	Curriculum Structure	
10	The study program structure includes clusters of courses, such as University/Basic Educational,	Yes

No.	Assessment Aspect	Empirical Condition of the Study Program Curriculum
	faculty, and study program courses	
11	The credits of each course cluster are proportional (University and Basic Educational courses weight 20 credits, faculty courses weight 20 credits, and study program courses weight 104 credits)	For practicums in electronics and electricity, the credits should be added, especially for providing the students from senior high school with more knowledge.
12	University and Basic Educational courses reflect YSU vision	Yes
13	Faculty courses reflect the programs of the faculty	Yes
14	Study program courses reflect YSU vision and the clusters of science	Yes
15	Course description contains the scope of analysis	Yes
16	The courses determined in each semester are parallel or in series	Yes
17	The number of courses in each semester is 24	Yes
18	The rules of conducting the lectures should involve student activities which are in line with the sub-learning objectives. The learning methods used in lectures focus mostly on students'	The lectures should focus on the implementation of project-based methods and the efforts to in improving students' independence.

No.	Assessment Aspect	Empirical Condition of the Study Program Curriculum
	participation.	
19	The rules of assessment include the objectives of assessment, assessment techniques, and achievement criteria.	Yes

Other Suggestions:

Other competences that need to be added:

There should be competences in SCADA because Industrial Automation Engineering program in vocational high schools provide materials about SCADA. Moreover, many graduates have jobs requiring the mastery of SCADA, and in PT. PLN (a state-owned electricity company), SCADA is used frequently.

Conclusion:

The electrical engineering curriculum draft is ready to be implemented.

Yogyakarta, December 5, 2016

Reviewer

(Drs. Suroto)