Curriculum Document

of the Study Program

Physics Education

Faculty of Mathematics and Science Education

Academic Year 2025

CURRICULUM DOCUMENT APPROVAL SHEET

Faculty	: Faculty of Mathematics and Science Education
Study Program	: Physics Education
Code	: P276
Strata	: S2
Academic Degree	: M.Pd
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Year of Establishment	: 2012
Establishment Decree	: 3406/UN40/DT/2012.
National Accreditation Level	: Excellent
National Accreditation Number	: 82/SK/LAMDIK/Ak/M/I/2023 A
Accreditation Year	: 2023
International Accreditation Level	: -
International Accreditation Number	: 0
Accreditation Year	: 0

Approved by, Dean	Bandung, Head of Study Program
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PROGRAM CURRICULUM DESIGN

A. Study Program Profile

The Physics Education Masters Program (PS S2 PF) was established on May 24 2012 through Decree No. 3406/UN40/DT/2012. The name of the Physics Education study program is by the nomenclature as stated in Minister of Research and Technology Decree No. 257/M/KPT/2017 Concerning Names of Study Programs in Higher Education. PS S2 PF has been accredited as Superior through Decree No.182/SK/LAMDIK/Ak/M/I/2023 date: 31 January 2023, valid until 13 March 2028. The tightness of PS S2 PF is 1:3

B. Vision

To conduct education and research in physics education based on excellent, pioneering, and internationally renowned technology.

C. Mission

[1] To conduct a master's program to equip physics educators with the skills to manage education professionally, effectively, and innovatively in line with technological advancements.

[2] To Develop research in physics education as a foundation for the professional, high-quality, and innovative development of a master's program in line with technological advancements.

[3] To provide community service programs based on the results of master's level research in physics education, executed professionally, with high quality, and innovatively in line with technological advancements.

[4] To internationalize the master's program in Physics Education through the development and strengthening of educational networks and partnerships at the national, regional, and international levels.

D. Goals

[1] Possessing a broad understanding and deep commitment to physical education, and managing education in a professional, high-quality, and innovative manner.

[2] Possessing a deep knowledge of physics content and a strong understanding of physics pedagogy, including teaching approaches, methods, and strategies.

[3] Possessing knowledge of assessment in learning, student characteristics and development, and curriculum evaluation, utilizing scientific knowledge and technology.

[4] Possessing the ability to analyze and apply various appropriate research methods and designs to solve problems in physics education.

[5] Able to communicate and disseminate knowledge and technology in physics education orally and in writing to gain global recognition.

E. Strategy

[1] Updating course materials to ensure that students acquire the latest knowledge aligned with academic standards and the advancements of the 4th Industrial Revolution.

[2] Conducting regular reviews of the Academic Information System (SAP) and optimizing the enhancement of facilities and infrastructure to support the implementation of the three main functions of higher education, developing ICT and LAN networks, updating data maintenance procedures, and procuring additional supporting equipment.

[3] a. Optimizing and enhancing facilities and infrastructure to support implementing the three main

functions of higher education (teaching, practical work, and research) and student services. b. Developing ICT and LAN networks, updating data maintenance procedures, and procuring additional supporting equipment. c. Reviewing and revising curricula and related materials (descriptions, academic information systems).

[4] a. Implementing a comprehensive research and community service program that actively involves students. b. Engaging students in research and community service activities. c. MPublishing research findings and studies in various academic journals.

[5] a. Involving faculty members in national and international academic forums. b. Developing communication with practitioners and the educational community. c. Increasing the number of scholarly publications by faculty and students.

F. Curriculum Evaluation

Evaluation and implementation of the curriculum and tracer study for the Master's Program in Physics Education (hereafter referred to as the S2 PF Program), considering the input, process, and output dimensions or education models. The first step taken by the S2 PF Program in developing the curriculum is to conduct a needs analysis. Based on the results of the needs analysis, the following were found: a. There is too much overlap in content between undergraduate and master's level physics education courses, so the plan is to revise the descriptions of each course, taking into account the depth and breadth of content already covered at the undergraduate level. b. Based on the evaluation of the National Higher Education Standards (KKNI), the Competency Standards/Learning Outcomes (CP/LO) formulated by professional associations, and UPI's policies regarding curriculum changes, the courses in the master's program in Physics Education are still too general and do not align with the graduate profile. Referring to the graduate profile, new CP/LOs need to be formulated while still considering the KKNI and CP formulated by professional associations. Therefore, the plan is to analyze and reformulate the CP/LOs. c. While most of the program's needs have been met, there are still some gaps that need to be addressed. Therefore, the knowledge and skills that teachers/alumni have not acquired during their studies and are required in the workplace will be taught through new courses.

G. Foundations and Principles of Curriculum

The design and development of the curriculum for the Master's Program in Physics Education is grounded in contextual philosophical, sociological, psychological, and legal foundations.

1. The philosophical foundations underlying the curriculum design of the Master's Program in Physics Education at FPMIPA UPI are perennialism, essentialism, existentialism, progressivism, and reconstructionism. Progressivism, in particular, emphasizes the importance of catering to individual differences, student-centred learning, and varied learning experiences. Progressivism is the foundation for developing active student learning. This progressive educational movement aims to develop educational theories, including: (1) students should be free to develop naturally, (2) direct experience is the best way to stimulate learning interest, (3) teachers should be researchers and learning facilitators, and (4) progressive schools should be laboratories for pedagogical and experimental reforms. Reconstructionism is a further elaboration of progressivism. In reconstructionism, the future of human civilization is strongly emphasized. In addition to emphasizing individual differences as in progressivism, reconstructionism further emphasizes problem-solving, critical thinking, and the like. Adherents of this movement emphasize the outcomes of learning rather than the process.

   The philosophies of Perennialism, Essentialism, and Existentialism underpin the development of a Subject-Centered Curriculum Model. Perennialism places greater emphasis on the eternal, the ideal, truth, and beauty rather than on specific cultural heritage and social impact. Knowledge is considered more important and less attention is paid to daily activities. Education based on this philosophy emphasizes absolute truth, a universal truth that is not bound by time

and place. This philosophy is more oriented towards the past. According to this philosophy, the principles of education are: (a) the concept of education is eternal because the nature of human beings never changes; (b) the core of education should be to develop the uniqueness of human beings as thinking beings; (c) the goal of learning is to know the absolute and universal truth; (d) education is preparation for real life; and (e) eternal truths are taught through basic subjects. The educational process based on this is traditional.

Essentialism emphasizes the importance of inheriting culture and providing students with knowledge and skills to become useful members of society. Mathematics, science, and other subjects are considered the fundamental substances of the curriculum that are valuable for life in society. Like Perennialism, Essentialism is also more oriented towards the past.

Existentialism emphasizes the individual as the source of knowledge about life and meaning. To understand life, one must understand oneself. According to this philosophy, truth is relative and depends on individual decisions, and values are determined by each individual. Education, according to this philosophy, aims to develop individual awareness, provide freedom to choose ethics and encourage the development of self-knowledge and self-responsibility, both in individual and group work. The material taught emphasizes the direct needs of human life. Learners need to gain experience through indirect teaching techniques.

A curriculum based on classical philosophies (Perennialism, Essentialism, and Existentialism) prioritizes mastery of subject matter. On the other hand, a curriculum based on Progressivism places more emphasis on the needs, interests, and lives of the learners.

2. Psychological foundations serve as a guiding principle for curriculum implementation, particularly in the learning process. Theories used as psychological foundations include behaviourism (functionalism), cognitivism, humanism, and constructivism.

Behaviorism views individuals as reactive beings who respond to their environment (Schunk, 1986). Experiences and the reinforcement of these experiences shape an individual's learning behaviour. Behaviourism views learning as a change in behaviour resulting from the interaction between a stimulus and a response (Robert, 2014). In this learning theory, often called S-R (Stimulus-Response) psychology, human behaviour is controlled by rewards or reinforcements from the environment. Learning designed and implemented based on behaviourism views knowledge as objective, certain, fixed, and unchanging. Knowledge is neatly structured, so learning is the acquisition of knowledge, while teaching is the transfer of knowledge to the learner.

Cognitive theory views an individual's behavior as determined by their perception and understanding of the situation related to their learning goals. Learning is a change in perception and understanding that is not always visible as observable behaviour. According to cognitive theory, knowledge is constructed within an individual through ongoing interaction with the environment. Cognitive psychologists believe that prior knowledge greatly determines the success of learning new information. This theory views learning as an internal process that involves memory, retention, information processing, emotions, and other psychological aspects. Learning is an activity that involves complex cognitive processes. In learning practice, cognitive theory is evident in concepts such as Piaget's stages of development, Ausubel's advance organizers, Bruner's concept attainment, Gagne's hierarchy of learning, and Norman's web teaching. The nature of learning according to cognitive theory is described as an activity involving organizing information, reorganizing perception, and internal processes.

Constructivist learning theory understands learning as a process of constructing knowledge by

learners themselves. Knowledge exists within the individual who is knowing (Schunk, 1986). The construction of knowledge is done by the learners themselves; learners must be active during the learning process, actively thinking, constructing concepts, and making meaning of what they are learning, but most importantly, it is the learner's intention to learn determines the occurrence of learning. Constructivism focuses on how individuals construct knowledge from their experiences, mental structures, and beliefs used to interpret objects and events. The constructivist view acknowledges that the mind is a crucial instrument in interpreting events, objects, and views of the real world, where such interpretations consist of an individual's basic knowledge.

Humanistic theory posits that the learning process should begin and be directed towards humanizing individuals. Humanistic theory emphasises the content of learning rather than the learning process itself. This theory focuses more on educational concepts to shape the desired human being, as well as on the ideal form of the learning process. Humanistic theory argues that any learning theory can be utilized, as long as the goal is to humanize individuals, that is, to achieve self-actualization, self-understanding, and optimal self-realization. In practice, this humanistic theory tends to direct learners towards inductive thinking, emphasizing experiences, and requiring active involvement of learners in the learning process.

3. Social foundations are the study of the current and future development of society. The scope of this study is very broad, encompassing social, cultural, economic, religious, political, and even security aspects. The core of this study is to reconstruct society in the future, reducing or eliminating cultures that are not supportive of change and developing cultures considered to be able to accelerate change. The curriculum must essentially accommodate social and cultural aspects. The sociological aspect is concerned with the diverse social conditions of society, such as industrial, agricultural, fishing, and so on. Education in educational institutions is essentially aimed at educating members of society to live in integration, interact, and adapt with other members of society and improve their quality of life as cultured beings. This implies that the curriculum, as one of the tools to achieve educational goals, must contain universal cultural elements such as values, attitudes, knowledge, and skills.

4. The legal basis for the development of the curriculum for the Master's Program in Physics Education encompasses all the legal provisions outlined below:
    a. Law Number 20 of 2003 on the National Education System
    b. Law Number 14 of 2005 on Teachers and Lecturers
    c. Law Number 12 of 2012 on Higher Education, Article 35 Paragraph (1) and Paragraph (2).
    d. Government Regulation Number 4 of 2014 on the Implementation of Education and Higher Education Management
    e. Presidential Regulation Number 8 of 2012 on the Indonesian National Qualifications Framework
    f. Presidential Regulation Number 13 of 2015 concerning the Ministry of Research, Technology, and Higher Education
    g. Regulation of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 53 of 2023 concerning Higher Education Quality Assurance
    h. Regulation of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 53 of 2023 concerning Higher Education Quality Assurance;
    i. Decree of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 210/M/2023 concerning the Main Performance of Higher Education Institutions and Higher Education Service Institutions in the Ministry of Education, Culture, Research, and Technology

j. The decision of the Minister of Education and Culture Number 74/P/2021 concerning the Recognition of Credit Units for the Merdeka Campus Program
k. Decision of the Director General of Learning and Student Affairs of the Ministry of Research, Technology, and Higher Education of the Republic of Indonesia Number 123/B/SK/2017 concerning Guidelines for the Implementation of Previous Learning;
l. Regulation of the University of Education Indonesia Board of Trustees Number 03/PER/MWA/UPI/2015 concerning the Implementation of Government Regulation Number 15 of 2014 on the Statutes of Universitas Pendidikan Indonesia as amended several times by the Board of Trustees Regulation Number 03/PER/MWA UPI/2019 concerning the Third Amendment to the Board of Trustees Regulation Number 03/PER/MWA UPI/2015 on the Implementation of Government Regulation Number 14 of 2014 on the Statutes of Universitas Pendidikan Indonesia;
m. Regulation of the Academic Senate of the University of Education Indonesia Number 01 of 2023 concerning the Standards of Learning Processes at the University of Education Indonesia
n. Regulation of the Academic Senate of the University of Education Indonesia Number 02 of 2023 concerning Degrees, Competency Certificates, Professional Certificates, Titles, and the Manner of Writing Titles at Universitas Pendidikan Indonesia
o. Regulation of the Rector of the University of Education Indonesia Number 18 of 2023 concerning the Equivalence of Credit Units and Learning Outcomes at Universitas Pendidikan Indonesia

H. Graduate Profile

The graduate profile of the S2 Physics Education program is to produce physics educators who possess strong teaching and research competencies, as well as character and innovation.

I. Program Educational Objective (PEO)

PEO	%	Description	%	Indicator
PEO - 1	40%	Graduates possess in-depth knowledge and mastery of Physics content as well as Physics pedagogy, encompassing approaches, methods, and strategies, as well as assessing, evaluating, and developing Physics learning.	20%	To pursue doctoral studies in Science Education with a concentration in Physics Education.
			10%	Able to develop educational institutions in their workplace based on their expertise.
			10%	Have the opportunity to obtain scholarships for further education from domestic and international institutions/organizations.
PEO - 2	40%	Graduates are capable of working independently and collaboratively in solving Physics education problems and possess responsibility and commitment to their work	15%	Actively engage in professional development within the education community, particularly in Physics Education

			15%	Achieve excellence in their work environment, demonstrated by recognition from peers and superiors, leading to promotions.
			10%	Be invited as a speaker at scientific forums on Physics education and learning.
PEO - 3	20%	Graduates possess the ability to develop knowledge and technology in Physics education through interdisciplinary or multidisciplinary research approaches, leading to the creation of innovative and validated works	10%	Involved in physics education research and able to publish articles in nationally and internationally reputable journals in the field of education and learning
			10%	Capable of developing various innovations required in physics education, thereby creating job opportunities for the community.
Total	100%		100%	

J. Program Learning Outcomes (PLO)

No	Program Learning Outcomes (PLO)
1	Demonstrating scientific, educational, and religious attitudes and behaviours, contributing to the improvement of the quality of life in society, nation, and state based on academic culture, norms, and ethics
2	Mastery of classical and modern physics theoretical concepts in solving contextual problems.
3	Mastery of educational philosophy, concepts, and learning theories, and their implications for physics education
4	Mastery of quantitative, qualitative, or mixed methods research in physics education to address physics education problems using interdisciplinary or multidisciplinary approaches
5	Able to integrate learning and innovation skills, technology and information proficiency, career development, and life skills to become a lifelong learner.
6	Able to develop and publish logical, critical, systematic, and creative thinking through scientific research, design creation, or artwork using interdisciplinary or multidisciplinary approaches, paying attention to and applying humanities values according to their field of expertise.
7	Conducting and managing physics education research to solve problems using interdisciplinary or multidisciplinary approaches, leading to innovative and validated research outputs
8	Publishing research papers in accredited national journals, international conference

	proceedings, or international journals.

K. Plotting Of PEO-PLO

PLO Code	Program Education Outcome (PEO)			
	PEO - 1 40 %	PEO - 2 40 %	PEO - 3 20 %	Result
1	✓	✓	✓	100
2	✓			40
3		✓		40
4			✓	20
5	✓		✓	60
6		✓	✓	60
7			✓	20
8			✓	20

L. Field of Study (Body Of Knowledge)

1. BK-03: Physics Pedagogy
2. BK-02: Knowledge Of Physics
3. BK-01 : Academic Skill
4. BK-04: Physics Education Research

M. Mapping of Study Fields - Courses

Courses	ECTS
FIELD OF STUDY: BK-03: PHYSICS PEDAGOGY	
Innovation in Physics Learning Media	6
Assessment in Physics Education	6
Innovation in Physics Learning Material	6
Innovation in Physics Learning Media	6
PHYSICS LESSON PLANNING	4.5
FIELD OF STUDY: BK-02: PHYSICS SCIENCE	
Earth and Space Science Education	4.5
Technology and Engineering Literacy Learning	4.5
Classic Mechanics and Quantum	4.5
Electrodynamics	4.5
FIELD OF STUDY: BK-01: ACADEMIC SKILLS	
Curriculum Development in Physics Education	4.5
Quality Assurance in Physics Education	4.5
Physics Experiment Development	4.5
FIELD OF STUDY: BK-04: PHYSICS EDUCATION RESEARCH	
Standardised Physics Test	4.5
Scientific Article Writing Tecnique	4.5

N. Course Mapping - PLO

Courses	ECTS	PLO								SUM
		1	2	3	4	5	6	7	8	
Innovation in Physics Learning	6	3		3	2	3				11/24
PHYSICS LESSON PLANNING	4.5	3		3	2	3				11/24
Classic Mechanics and Quantum	6	3	3			3				9/24
Electrodynamics	6	3	3			3	2			11/24
Innovation in Physics Learning Material	6	3		3		3	2			11/24
Innovation in Physics Learning Media	6	3		3			2			8/24
Assessment in Physics Education	6	3		3		3	3			12/24
Curriculum Development in Physics Education	4.5	3	2	3		3	3			14/24
Earth and Space Science Education	6	3	3			3	3			12/24
Physics Experiment Development	6	3	3	2		3	3			14/24
Scientific Article Writing Tecnique	6	3				3	3	3	3	15/24
Standardised Physics Test	6	3		3		3	3		3	15/24
technology and Engineering Literacy Learning	6	3	2	3	2	3	3			16/24
Quality Assurance in Physics Education	6	3				3	3			9/24
Sum		42/42	16/42	26/42	6/42	3/42	6/42	0/42	0/42	

O. Courses

No	Courses code	Courses	ECTS	Semester							
				1	2	3	4	5	6	7	8
Linear Development of Study Program Skills **(PLKP)**											
1	FI506	PHYSICS INSTRUCTIONAL STRATEGIES	4.5	✓							
2	FI551	PHYSICS LESSON PLANNING	4.5		✓						
3	FI505	PHYSICS INSTRUCTIONAL EVALUATION	4.5			✓					
Academic Skills Development **(PKA)**											
1	KA700	PHILOSOPHY OF SCIENCES	3	✓							
2	KA701	PEDAGOGICAL STUDIES	3		✓						
3	KA702	HIGHER ORDER THINKING	4.5			✓					
4	KA703	SCIENTIFIC LITERACY	4.5			✓					
5	KA704	TECHNOLOGICAL LITERACY	4.5			✓					
6	KA705	RESEARCH DESIGN	4.5		✓						
7	KA706	APPLIED STATISTICS	4.5	✓							
8	KA707	COMMUNICATION SKILLS	4.5			✓					
Scientific Field Expertise Development **(PKBI)**											
1	FI733	CLASSIC MECHANICS AND QUANTUM	6	✓							
2	FI735	INNOVATION IN PHYSICS LEARNING MATERIAL	6	✓							
3	FI736	INNOVATION IN PHYSICS LEARNING MEDIA	6	✓							
4	FI739	CURRICULUM DEVELOPMENT IN PHYSICS EDUCATION	4.5	✓	✓						
5	FI734	ELECTRODYNAMICS	6		✓						
6	FI737	ASSESSMENT IN PHYSICS EDUCATION	6		✓						
7	FI741	PHYSICS EXPERIMENT DEVELOPMENT	4.5		✓	✓					
8	FI743	STANDARDISED PHYSICS TEST	4.5		✓	✓					
9	FI744	TECHNOLOGY AND ENGINEERING LITERACY LEARNING	4.5		✓	✓					
10	FI754	COGNITIVE PSYCHOLOGY OF PHYSICS LEARNING	4.5		✓	✓					
11	KA710	MASTER'S FINAL PROJECT PROPOSAL	6			✓					
12	KA711	LITERATURE REVIEW	9		✓						
13	KA712	RESEARCH INSTRUMENT SEMINAR	6		✓						
14	KA713	RESEARCH DATA ANALYSIS SEMINAR	6		✓						
15	KA719	RESEARCH PROTOCOL SEMINAR	6		✓						
16	FI738	Innovation in Physics Learning	6			✓					
17	FI740	Earth and Space Science Education	4.5		✓	✓					
18	FI742	Scientific Article Writing Technique	4.5		✓	✓					

19	FI745	Quality Assurance in Physics Education	4.5		✓	✓					
20	FI765	Physics Education for Sustainable Development	4.5		✓	✓					
21	KA716	PUBLICATION 1	9			✓					
22	KA714	THESIS	12				✓				
23	KA717	PUBLICATION 2	12				✓				
24	KA718	PUBLICATION 3	12				✓				

P. Plan for Implementation of Students' Learning Rights Outside the Study Program

The International Credit Transfer program is part of the Independent Campus Learning Merdeka (MBKM) policy, designed to facilitate students in strengthening and enhancing their competencies through other study programs or institutions. Students are prepared to have global competencies to anticipate the intense global competition in various aspects through cooperation with foreign universities. Academic credit transfer is evaluating qualification components to determine equivalence with other qualifications by unifying comparable credits for academic achievement and student performance. Credit transfer is a mechanism for recognizing the workload and achievements obtained by students from one higher education institution to another. Credit transfer and acquisition is the recognition of the results of the educational process expressed in credit units to achieve learning competencies in accordance with the curriculum. Credit transfer and acquisition can occur between the same or different study programs. Study programs are free to determine which courses can be transferred from study programs at other universities.

The International Credit Transfer program is a process of recognizing the academic workload and learning outcomes achieved by a student from a partner university abroad (host university). The International Credit Transfer program provides opportunities to interact with students and communities abroad. Thus, students will gain added value in the form of improved hard skills and soft skills, expanded and strengthened networks, cooperation, understanding of social and cultural aspects, and internationalization of higher education in Indonesia. Students will have learning experiences to develop themselves and contribute positively to national development and the nation's competitiveness at the international level in the 21st century. The transferred credits can combine courses, final projects, internships, and/or field experiences. The number of credits students obtain equals 6 to 20 credit hours. The International Credit Transfer program is implemented online.

A Double Degree program is an academic program that allows a student to earn two academic degrees simultaneously or a double master's degree in a single study period. These two degrees are obtained from domestic and foreign universities that have established a partnership.

The Double Degree Program is held with the scheme of the first year of study in the Physics Education Masters study program FPMIPA UPI and the second year at a partner university abroad. Students will receive two degrees (from UPI and the partner university).

Q. Curriculum Implementation

The curriculum implementation design includes five main activities, namely the learning process, the MBKM program guidance process, the assessment process and assessment criteria, the final assignment, and determining learning completion. 1. Learning Process Learning is the interaction process between students and lecturers and learning resources in a learning environment. The characteristics of the learning process developed are interactive, holistic, integrative, scientific, contextual, thematic, effective, collaborative, and student-centred or student-centred learning (SCL) (SN-Dikti Article 11), for example, Case method and Team-Based Project. Student-centred means that the learning outcomes of graduates are achieved through a learning process that prioritizes the development of creativity, capacity, personality, and student needs, as well as developing independence in seeking and finding knowledge.

1. Provisions for implementing learning:
   a. The student's study load is stated in the amount of credits.
   b. A semester is a unit of time for the effective learning process for at least 16 (sixteen) weeks, including midterm exams and final semester exams. c. One academic year consists of 2 (two) semesters, and study programs can hold intermediate semesters (dense semesters) which are held in the form of face-to-face lectures at least 16 (sixteen) times including intermediate midterm exams and final semester exams

2. MBKM program guidance process

Technical guidance for students participating in the Independent Learning (MBKM) program such as the International Credit Transfer Program is carried out through periodic monitoring by the study program in coordination with the PA lecturer and the parties involved. The MBKM guidance process begins with the student consultation mechanism with the PA lecturer, guidance when students carry out MBKM activities outside the campus, and guidance on reporting MBKM activities so that credit transfers and credit acquisition are carried out and determining courses that can be transferred credit from study programs at other universities.

3. Assessment Process Assessment Process and Criteria

Assessment is the process of identifying, collecting and preparing data and evidence to evaluate the process and results of student learning. The assessment system includes the process and results of student learning which include assessment principles, assessment techniques and instruments, assessment mechanisms and procedures, assessment implementation, assessment reporting, and student graduation. Assessment of learning outcomes is carried out in the domains of attitudes, knowledge and skills. The assessment technique for the attitude domain is carried out through observation, self-assessment, and assessment between students (students assess the performance of colleagues in one field or group)

4. Final Project

The final assignment of students in the Physics Education master's program is compiled in the form of a thesis. The thesis is compiled by fully upholding academic ethics such as preventing plagiarism. The field of study of the thesis must be relevant to the scientific field managed by the Physics Education master's program. The weight and depth of the thesis study are adjusted to the educational program. Thesis compilation guidance is carried out by a maximum of 2 supervising lecturers..

5. Determination of Learning Completion

Student completion is determined based on UPI's educational guidelines as follows:

a. Students must complete the required credit hours as stipulated in the UPI curriculum.
b. Grades for each course must meet the passing requirements.

For Master's in Physics Education students, graduation is evaluated through several stages: qualification examination, proposal seminar, thesis phase 1 examination, and thesis phase 2 examination. Students must meet the requirements for each examination stage.

R. The Semester Learning Plan(RPS) / Module Handbook

The Semester Learning Plan (RPS) or module handbook is a supporting document in the curriculum document. The RPS serves as a guideline for conducting lectures in one semester. The RPS document is compiled separately from the curriculum document but is an integral part of the overall curriculum document of the study program. Each course instructor develops the RPS. The development of the RPS is based on Program Educational Objectives (PEO) and Course Learning Outcomes (CLO), which are determined by student learning achievements. The RPS is updated at least once a year based on the results of the curriculum evaluation.

S. Evaluation of Study Program Curriculum

The Master of Science in Physics Education program has designed a curriculum evaluation that specifically details the evaluation cycle and the involvement of various stakeholders in curriculum evaluation through graduate, stakeholder, student, and faculty surveys conducted on a five-year basis. Curriculum changes are based on several factors, including developments in science, government policies, the needs of graduates, and the results of ongoing curriculum evaluations. The program's curriculum evaluation is based on Provus' Discrepancy Evaluation Model. This model is a suitable approach for evaluating the program's curriculum based on national higher education standards, as each higher education institution has its educational standards based on the National Education Standards. The results of this evaluation model identify the gap between the expected conditions and the actual conditions in the field, thus providing a basis for

The model also provides guidance on the next steps to be taken in decision-making. Additionally, this model aims to determine the level of alignment between the established standards or criteria in the curriculum and the actual performance (implementation outcomes).

The curriculum evaluation model using Provus' discrepancy model consists of six interrelated stages: 1) needs analysis, 2) curriculum design and development, 3) resources, 4) curriculum implementation process, 5) curriculum implementation outcomes, and 6) comparison. Each stage is evaluated by comparing the performance of the evaluated element against the established standards. The discrepancy between performance and standards becomes a consideration for modification. Modifications are made to the performance that does not meet the established standards, or the standards are modified if the performance has exceeded them. Next, it is decided whether to improve the performance or standards, or whether the performance is considered complete in the evaluation process

Based on the evaluation results of the 2018 curriculum through the Context-Input-Process-Product (CIPP) model, it can be concluded that:

1. The 2018 curriculum has been reviewed periodically every year and is comprehensive in accordance with the needs, and developments in science and professions at the regional, national, and international levels, and complies with Article 13 paragraph (3) of Government Regulation of the Republic of Indonesia Number 15 of 2014 concerning the Statute of the University of Education Indonesia.
2. There is consistency in implementing the curriculum with national (KKNI) and international standards.
3. There has been an improvement in the quality of education, resulting in graduates who can be recorded in the Key Performance Indicators (KPI).

Recommendation

A periodic and continuous curriculum revision is needed