SEMESTER LEARNING PLAN

BASIC PHYSICS COURSES
(23H02110902)

TEACHING TEAM

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STUDI PROGRAM OF MATHEMATICS - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY
MAKASSAR
2025

STUDY PROGRAM OF MATEMATIKA - S1
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
HASANUDDIN UNIVERSITY

Vision

The scientific vision is to become a study program with an international reputation in the development of mathematics based on the Indonesian maritime continent by 2030

Vision Strategy

Misson

To fulfill the above vision, the Undergraduate Mathematics Study Program has four missions, namely:

- Organizing innovative and effective mathematics learning to improve the quality and creativity of students in order to compete nationally and internationally.
- Improving a research culture that produces internationally reputable publications.
- Playing an active role in community service activities and collaborating with other academic institutions, government, business, media and society.
- Carry out governance in the Mathematics Study Program that is effective, efficient and transparent based on IT and ISO 9001:2015 standards to achieve the tridharma goals.

Graduate Profiles

Gagal diterjemahkan

PLO charged to courses

CPL-8 (S1) - The students have integrity that highly values the supreme divinity, social responsibility, and professional ethics

CPL-9 (S2) - The students are able to adapt and develop self-abilities, both in mathematics and other relevant areas of science in their professional lives

CPL-1 (ILO 1) - Students are able to demonstrate an advanced understanding of basic pure and simple applied mathematics.

CPL-5 (KK1) - The students are able to construct mathematical modelling with relatively new ideas and present the results orally and in writing

Course Learning Outcomes (CLO)

CPMK-1: Able to describe the basic properties of objects/material in the form of physical equations related to the quantity and unit, kinematics and particle dynamics, the law of energy and momentum, heat and temperature, and thermodynamics (CPL8 dan CPL1)

CPMK-2: Able to apply static and dynamic fluid equations, static electricity, electrical circuits, magnetic fields, waves, optics, and modern physics to get a solution from physics problems. (CPL8 dan CPL1)

CPMK-3: Able to describe orally the application of physics in daily life, the use of technology and analysis in research (CPL8, CPL9 dan CPL5)

Sub-CLO

Sub CPMK-1: Able to solve basic physical equations in resolving kinematics problems, and Newton's laws. (CPMK-1)

Sub CPMK-2: Able to use the basic physical equation in solving work problems and energy, HK. Energy conservation and linear momentum, as well as temperature and heat (CPMK-1)

Sub CPMK-3: Able to explain the basic properties of physics based on thermodynamic concepts and

processes such as isobaric, isovolum, isothermal and adiabatik, as well as static and dynamic fluids (CPMK-2)

Sub CPMK-4: Able to calculate the Coulomb force, electric field strength, potential and electricity business at point charge, in closed electrical circuits, and magnetic field strength. (CPMK-2)

Sub CPMK-5: Able to explain precisely the transfersal and longitudinal wave equations and wave propagation properties as in mirrors and lenses and in diffraction and interference (CPMK-2)

Sub CPMK-6: Able to present the search results of scientific article literature that uses the results of research on physics case studies in wave studies (CPMK-3)

Learning Analytics

Basic Physics

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Able to present the search results of scientific article literature that uses the results of research on physics case studies in wave studies (CPMK-3)

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Able to explain precisely the transfersal and longitudinal wave equations and wave propagation properties as in mirrors and lenses and in diffraction and interference (CPMK-2)

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Able to calculate the Coulomb force, electric field strength, potential and electricity business at point charge, in closed electrical circuits, and magnetic field strength. (CPMK-2)

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Able to explain the basic properties of physics based on thermodynamic concepts and processes such as isobaric, isovolum, isothermal and adiabatik, as well as static and dynamic fluids (CPMK-2)

↑

Able to use the basic physical equation in solving work problems and energy, HK. Energy conservation and linear momentum, as well as temperature and heat (CPMK-1)

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Able to solve basic physical equations in resolving kinematics problems, and Newton's laws. (CPMK-1)

HASANUDDIN UNIVERSITY
FAKULTY OF MATHEMATICS AND NATURAL SCIENCES
STUDY PROGRAM OF MATHEMATICS - S1
SEMESTER LEARNING PLAN

Course	Code	Cource Group	Credits	SEMESTER	Compilation Date
Basic Physics	23H02110902	Basic Science	2	1	1 Agustus 2025

AUTHORITY	SLP Developer Lecturer	Coordinator	Head of Study Program
	Prof. Dr. Paulus Lobo Gareso, M.Sc.	Prof. Dr. Paulus Lobo Gareso, M.Sc.	Dr. Firman, S.Si.,M.Si.

Learning Outcomes Course	**SLOs that are imposed on the course**	
	SLO-8:	Mahasiswa memiliki integritas yang sangat menghargai keilahian tertinggi, tanggung jawab sosial, dan etika profesional
	SLO-9:	Mahasiswa dapat beradaptasi dan mengembangkan kemampuan diri, baik dalam matematika dan bidang ilmu lain yang relevan dalam kehidupan profesional mereka, dengan budaya belajar sepanjang hayat
	SLO-1:	Mahasiwa memiliki pemahaman yang relatif mendalam dalam matematika murni dan matematika terapan sederhana.
	SLO-5:	Mahasiswa dapat membangun pemodelan matematika dengan ideide yang relatif baru dan mempresentasikan hasil dengan jelas secara lisan dan tertulis
	SLO ⇒ Course Learning Outcomes	
	After completing this course, it is expected:	
	SLO-1	**CLO-1:** Able to describe the basic properties of objects/material in the form of physical equations related to the quantity and unit, kinematics and particle dynamics, the law of energy and momentum, heat and temperature, and thermodynamics
		CLO-2: Able to apply static and dynamic fluid equations, static electricity, electrical circuits, magnetic fields, waves, optics, and modern physics to get a solution from physics problems.
	SLO-8	**CLO-1:** Able to describe the basic properties of objects/material in the form of physical equations related to the quantity and unit, kinematics and particle dynamics, the law of energy and momentum, heat and temperature, and thermodynamics
		CLO-2: Able to apply static and dynamic fluid equations, static electricity, electrical circuits, magnetic fields, waves, optics, and modern physics to get a solution from physics problems.
		CLO-3: Able to describe orally the application of physics in daily life, the use of technology and analysis in research
	SLO-5	**CLO-3:** Able to describe orally the application of physics in daily life, the use of technology and analysis in research
	SLO-9	**CLO-3:** Able to describe orally the application of physics in daily life, the use of technology and analysis in research
	CLO ⇒ Sub-CLO	
		Sub-CLO-1: Able to solve basic physical equations in resolving kinematics problems, and Newton's laws.

	CLO-1	**Sub-CLO-2:**Able to use the basic physical equation in solving work problems and energy, HK. Energy conservation and linear momentum, as well as temperature and heat
	CLO-2	**Sub-CLO-3:**Able to explain the basic properties of physics based on thermodynamic concepts and processes such as isobaric, isovolum, isothermal and adiabatik, as well as static and dynamic fluids
		Sub-CLO-4: Able to calculate the Coulomb force, electric field strength, potential and electricity business at point charge, in closed electrical circuits, and magnetic field strength.
		Sub-CLO-5: Able to explain precisely the transfersal and longitudinal wave equations and wave propagation properties as in mirrors and lenses and in diffraction and interference
	CLO-3	**Sub-CLO-6:**Able to present the search results of scientific article literature that uses the results of research on physics case studies in wave studies

Correlation between SLOs/CLOs to Sub-CLOs

SLOs that are charged on the Course	CPMK	SUB CPMK	Form of Assessment*						Weight	Value	Student Score
			Formative	Sumative							
				Gagal diterjemahkan	Written Exam	Gagal diterjemahkan	Gagal diterjemahkan	Written Exam			
SLO-1	CLO-1	SUB-CLO-1		10	0	0	0	0	10		
SLO-1	CLO-1	SUB-CLO-2		10	0	0	0	0	10		
SLO-1	CLO-2	SUB-CLO-3		10	20	0	0	0	30		
SLO-1	CLO-2	SUB-CLO-4		0	0	10	0	0	10		
SLO-1	CLO-2	SUB-CLO-5		0	0	10	0	0	10		
SLO-5	CLO-3	SUB-CLO-6		0	0	0	10	20	30		
				30	20	20	10	20	100		

Course Description	The Basic Physics course is presented in the first year of study at Hasanuddin University which includes material on basic physics concepts which include kinematics and dynamics of particles, Newton's Laws, work and energy, law of conservation of energy and momentum, heat and the laws of thermodynamics, static electricity and electric circuits, magnetic fields, waves, wave properties such as refraction, reflection, interference and diffraction. Each subject is given example questions and problem solving using the problem set model. The end of this lecture is for students to write a paper with a case study on the application of physics in everyday life, and take the final semester exam.

Learning Materials/Subjects	1. Kinematics and Dynamics 2. Work and energy 3. Linear momentum and collision 4. Temperature and heat 5. Law thermodynamics 6. Static Fluid and Dynamic 7. Static electricity and dynamic 8. Sequence electricity 9. Magnetic field 10. Wave 11. Optical Geometry 12. Introduction to Physics Modern
Reference	**Main References**
	Physics Lecturer TEAM-FMIPA, Basic Physics 1, First Edition, Makassar 2010
	Additional References
	Halliday & Resnick, Physics Volume 1, Translation (Erwin Sucipto & Pantur Silaban), Jakarta, Erlangga 1994
Teaching Team	Prof. Dr. Paulus Lobo Gareso, M.Sc.
Course requirement	

Week	**Sub CPMK (End-of-stage learning ability)**	**Penilaian (*Assesment*)**		**Learning Forms and Methods [time estimate]**		**Content**	**Weight of Assessment (%)**
		Indicator	**Techniques & Criteria**	**Offline**	**Online**		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

1-2	Able to solve basic physical equations in resolving kinematics problems, and Newton's laws. (CPMK-1)	**Formative:** Practice Questions/Homework Activities • Problem resolution set • The accuracy of writing quantities and unit • Systematics and clarity of solution questions • Exact time **Sumative:** Gagal diterjemahkan	**Formative Criteria:** **Sumative Criteria:** Problem Based Learning (PBL) (10) **Assessment Technique:** Non Test	**Studying:** Problem-Based Learning (Problem-based Learning) TM [2x2x50"] Assignment (Students work on the problem set). BM [2x2x60"] PT [2x2x60"]	**Studying:** Problem-Based Learning (Problem-based Learning) Assignment (Students access SIKOLA and collect problem sets). PT [2x2x60"]	• Student Modules and Assignments in SIKOLA • Materials (1) Quantities, Units and Dimensions Reference: Physics Lecturer TEAM, Basic Physics 1, Chapter 1, First edition, Makassar 2010	10
3-5	Able to use the basic physical equation in solving work problems and energy, HK. Energy conservation and linear momentum, as well as temperature and heat (CPMK-1)	**Formative:** Q&A activity • Broad insight and relevant Practice Questions/Homework Activities • Completion of the problem set for each kinematics discussion, dynamics, work and energy, and linear momentum • Systematics and clarity of solution matter • Exact time **Sumative:** Gagal diterjemahkan	**Formative Criteria:** **Sumative Criteria:** Problem Based Learning (PBL) (10) **Assessment Technique:** Non Test	**Studying:** Problem-Based Learning (Problem-based Learning) TM [3x2x50"] Assignment (Students answer the lecturer's questions and/or work on the problem set). BM [3x2x60"] PT [3x2x60"]	**Studying:** Problem-Based Learning (Problem-based Learning) Assignment (Students access SIKOLA and collect problem sets). BM [3x2x60"]	• Student Modules and Assignments in SIKOLA • Material (2) Particle Kinematics and Newton's Laws about motion • Material (3) Work and energy , HK conservation energy • Material (4) Linear momentum and single impact dimensions Reference Physics Lecturer TEAM, Basic Physics 1, Chapter	10

6-8	Able to explain the basic properties of physics based on thermodynamic concepts and processes such as isobaric, isovolum, isothermal and adiabatik, as well as static and dynamic fluids (CPMK-2)	**Formative:** Q&A activity • Broad insight and relevant Practice Questions/Homework Activities • Completion of the problem set for each discussion of temperature and heat, thermodynamic processes (isobaric, isovolumic, isothermal and adiabatic) • Systematics and clarity of solution matter • On time **Sumative:** Gagal diterjemahkan	**Formative Criteria:** **Sumative Criteria:** Problem Based Learning (PBL) (10) Written Exam (20) **Assessment Technique:** Test	**Studying:** Problem-Based Learning (Problem-based Learning) TM [2x2x50”] TM [1x2x50”] Assignment (Students answer the lecturer's questions and/or work on the problem set). Assignment (Students complete formative tests). BM [2x2x60”] PT [2x2x60”]	**Studying:** Problem-Based Learning (Problem-based Learning) Assignment (Students access SIKOLA and collect problem sets). BM [2x2x60”]	• Material (5) Conversion of temperature, heat energy and transfer calor. • Material (6) Thermodynamics References Physics Lecturer TEAM, Basic Physics 1, Chapter 11,12, First edition, Makassar 2010.	30

9-11	Able to calculate the Coulomb force, electric field strength, potential and electricity business at point charge, in closed electrical circuits, and magnetic field strength. (CPMK-2)	**Formative:** Q&A activity • Broad insight and relevant Practice Questions/Homework Activities • Completion of static electricity problem sets (coulomb force, electric field strength and potential, electric circuits, and magnetic field strength. • Precision of writing quantities and units • Systematic and clarity of problem solving for each discussion (4 questions) • Exactly time **Sumative:** Gagal diterjemahkan	**Formative Criteria:** **Sumative Criteria:** Collaborative Learning (CoL) (10) **Assessment Technique:** Test	**Studying:** Group discussion (Small Group Discussion) TM [3x2x50”] Assignment (Students answer lecturer questions and/or work on problem sets). BM [3x2x60”] PT [3x2x60”]	**Studying:** Problem-Based Learning (Problem-based Learning) Assignment (Students access SIKOLA and collect problem sets). BM [3x2x60”]	• Student Modules and Assignments in SIKOLA • Material (8) Electricity Static • Material (9) Dynamic electricity, and circuits electric • Materials (10) Terrain magnetic • Material (11) Waves, mirrors and lens • Materials (12) Diffraction and interference. Reference. Physics Lecturer TEAM, Basic Physics 2, Chapters 1,3,5, 10 and 12, First Edition, Makassar, 2010	10

12-13	Able to explain precisely the transfersal and longitudinal wave equations and wave propagation properties as in mirrors and lenses and in diffraction and interference (CPMK-2)	**Formative:** Q&A activity • Broad and relevant insights Practice Questions/Homework Activities • Completion of the problem set of transfersal waves and longitudinal, and wave propagation properties such as in mirrors and lenses as well as diffraction and interference • The accuracy of writing quantities and unit • Systematic and clarity of problem solving for each topic (4 problem) • Exact time **Sumative:** Gagal diterjemahkan	**Formative Criteria:** **Sumative Criteria:** Collaborative Learning (CoL) (10) **Assessment Technique:** Test	**Studying:** Group discussion (Small Group Discussion) TM [2x2x50”] Assignment (Students answer lecturer questions and/or work on problem sets). BM [2x2x60”] PT [2x2x60”]	**Studying:** Problem-Based Learning (Problem-based Learning) Assignment (Students access SIKOLA and collect problem sets). BM [2x2x60”]	• Material(11) Wave • Materials (12) Diffraction and interference Reference. Physics Lecturer TEAM, Basic Physics 2, Chapters 5 and 12, First Edition, Makassar, 2010.	10

14-16	Able to present the search results of scientific article literature that uses the results of research on physics case studies in wave studies (CPMK-3)	**Formative:** • Reference current • Breadth of topic discussion, relevant with examples case • Attitude and mastery of the current material presentation • Activity discuss • Complete answer questions **Sumative:** Gagal diterjemahkan	**Formative Criteria:** **Sumative Criteria:** Case Study (CS) (10) Written Exam (20) **Assessment Technique:** Test and Non-Test	**Studying:** Case Study (Case Study) TM [2x2x50”] Assignment (Presenting students manage the discussion process with material determined by the lecturer, listening students contribute to discussion activities). BM [2x2x60”] PT [2x2x60”] In-class Written Test TM [1x2x50”]	**Studying:** Group discussion (Small Group Discussion), Project-Based Learning (Project-based Learning) Assignment (Students prepare papers/PPTs on their group material and study other topics to contribute to other group discussions). BM [2x2x60”]	• Material(11) Wave Reference. Physics Lecturer TEAM, Basic Physics 2, Chapters 5 and 12, First Edition, Makassar, 2010.	30
							100

Matrix of SLO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2	CLO-3
CPL-1 (ILO 1)	data not found (Weight 10%) data not found (Weight 10%)	data not found (Weight 10%) Written Exam (Weight 20%) data not found (Weight 10%) data not found (Weight 10%)	
CPL-5 (KK1)			data not found (Weight 10%) Written Exam (Weight 20%)
CPL-8 (S1)	data not found (Weight 10%) data not found (Weight 10%)	data not found (Weight 10%) Written Exam (Weight 20%) data not found (Weight 10%) data not found (Weight 10%)	data not found (Weight 10%) Written Exam (Weight 20%)
CPL-9 (S2)			data not found (Weight 10%) Written Exam (Weight 20%)

Evaluation Type and Assessment Weight

Type	Assessment Weight
Problem Based Learning (PBL)	30
Written Exam	20
Collaborative Learning (CoL)	20
Case Study (CS)	10
Written Exam	20
Total	100

Assessment and Evaluation of Student Achievement of CLOs

SLOs that are charged on the Course	CLO	SUB CLO	Form of Assessment*					Weight	Value	Student Score
			Formative	Sumative						
				Gagal diterjemahkan	Written Exam	Gagal diterjemahkan	Gagal diterjemahkan	Written Exam			
SLO-1	CLO-1	SUB-CLO-1		10	0	0	0	0	10		
SLO-1	CLO-1	SUB-CLO-2		10	0	0	0	0	10		
SLO-1	CLO-2	SUB-CLO-3		10	20	0	0	0	30		
SLO-1	CLO-2	SUB-CLO-4		0	0	10	0	0	10		
SLO-1	CLO-2	SUB-CLO-5		0	0	10	0	0	10		
SLO-5	CLO-3	SUB-CLO-6		0	0	0	10	20	30		
				30	20	20	10	20	100		