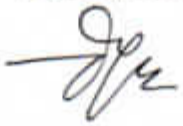
FPMIPA UPI	**SILABUS** **Waves, Sound and Optics** **SE 407-3 credits** **4th semester IPSE**	No. Dok : FPMIPA-SE-SL-21 Revisi : 00 Tanggal : 19 Januari 2011 Halaman : 1 dari 3
Dibuat Oleh :  (Andhy Setiawan,M.Si)	Diperiksa Oleh :  (Dr. Diana R.)	Disetujui Oleh :  (Dr.phil. Ari Widodo)

Description

This course is subject of compulsory study professional education of teachers (subject specific pedagogy), for prospective teachers of physics education graduates S1. Competencies expected of this course is the physics teacher candidates understand the concepts and principles of waves and optical phenomena, manage and develop their learning in school as the basic competencies in KTSP. In this lecture discussed the structure of matter, the expansion and deepening of the material, the essential concepts, practical learning and the development of: harmonic oscillation, kinematics of waves, dynamics of waves, sound, energetic waves and energetic sound, interference, diffraction, electromagnetic waves, optics and optical instruments, in accordance with the standards and basic competencies of physics in school. The method is discourse, problem solving, discussion and experimentation, using the print media, multimedia and demonstration tools. Assessment of learning outcomes include: UTS, UAS, report, experimental performance, and presentation of teaching material development. Main sources: Peraturan Menteri Pendidikan Nasional RI No. 22, 2006 about content standards for elementary and secondary education; and Hirose & Lonngren, 1985, Introduction to Wave Phenomena, John Wiley & Sons. Nelkon M. & Parker P., 1975, Advances Level Physics, Heinemann Education Books, London.

Syllabi

1. Courses Identity

a.	Name	: Waves, Sound, and Optics
b.	Code	: SE 407
c.	Credits	: 3
d.	Grade	: 2
e.	Classification	: Concentration Competences Course
f.	Program	: IPSE-FPMIPA UPI/S-1
g.	Statue	: compulsory
h.	Prerequisite	: general physics
i.	Lecturer	: Andhy Setiawan,M.Si.

2. Goal

After completion of this course students are expected to understand the material, the structure, the concept of waves, sound and optics, and are able to develop learning materials in schools, based on the standards and basic competencies that are relevant to the demands of content standards.

3. Content

In this lecture discussed the material: harmonic oscillation, kinematics of waves, dynamics of waves, sound, energetic waves and energetic sound, interference, diffraction, electromagnetic waves, optics and optical instruments

4. Learning Activities

- Methods : discourse, discussion, and experiments
- Approach : expository and inquiry
- Assignment : paper and presentation
- Media : hand out, overhead transparencies, PowerPoint slide, interactive physics, and demonstration tool (simple pendulum, string, spring, slinky, ripple tank, audio generator + vibrator, resonance tube, 3 cm wave device, cathode ray tube, optical holder, optical glass, and optical disc.

5. Assessment

- paper
- presentation
- UTS
- UAS
- Lecturer's policy

6. Meeting's Agenda

- 1st Meeting : lecture planning, refreshed understanding and development of syllabus, related wave and optical materials.
- 2nd Meeting : harmonic oscillations, including restoring force and inertia, and the oscillation equations for systems with one degree of freedom, the pendulum oscillation, and the oscillation of the spring.
- 3rd Meeting : the wave equation, wave as a function of space and time, the principle of superposition and beats.
- 4th Meeting : dispersivitas, Doppler effect, wave reflection and refraction (Snell's law)
- 5th Meeting : waves in the elastic medium (spring, rope), the sound waves in solids, liquids, and gases, and water surface waves.
- 6th Meeting : sound
- 7th Meeting : explanation of the wave equation through the conservation of energy, wave energy and intensity of the waves, the density of momentum, impedance and wave power, energy and intensity of the sound wave, and wave reflectance and transmittance.
- 8th Meeting : UTS
- 9th Meeting : Maxwell's equations in vacuum and medium, electromagnetic wave equation, electromagnetic wave propagation, electromagnetic wave spectrum.
- 10th Meeting : plane mirror, concave mirror, and convex mirror
- 11th Meeting : concave lenses, convex lenses, and lens combination
- 12th Meeting : planparalel and prism glass

- 13th Meeting : development of teaching materials of optical devices in daily life
- 14th Meeting : reflection lecture material
- 15th Meeting : reflection lecture material
- 16th Meeting : UAS

7. References

Main sources:

- *Permen Pendidikan Nasional RI No. 22 Tahun 2006 tentang Standar Isi untuk Pendidikan Dasar dan Menengah.*
- *Panduan Penyusunan Kurikulum Tingkat Satuan Pendidikan Jenjang Pendidikan Dasar dan Menengah*, Jakarta: BSNP
- *Panduan Penyusunan Silabus dan RPP*, Jakarta: Direktorat Jenderal Manajemen Pendidikan Dasar dan Menengah.
- *Peraturan Menteri Pendidikan Nasional No. 20 Tahun 2007 tentang Standar Penilaian Pendidikan.*
- Crawford, Jr., 1978, *Waves*, Berkeley Physics, Vol. 3, Mc Graw Hill, New York.
- Hirose & Lonngren, 1985, *Introduction to Wave Phenomena*, John Wiley & Sons.
- Ramalis T. Ramlan, 2001, *Gelombang dan Optik*, Bandung, JICA Publisher

Other sources:

- Davids J. Griffiths, 1995, *Introduction to Electrodynamics*, 2nd edition, Prentice Hall.
- Hecht, E., 1978, *Optics*, 2nd edition, Addison Wesley
- Pedrotti, F. L., and L. S. Pedrotti , 1993, *Introduction to Optics*, Prentice Hall
- William C. Elmore and Mark A. Heald, 1995, *Physics of Wave*, Dover Publication Inc
- Zahara Muslim, 1994, *Gelombang dan Optik*, Depdikbud-Dikti.