Wave

Module Name :	Waves	
Module Level :	Undergraduate	
Code :	32255034	
Sub-heading, if applicable :		
Classes, if applicable :		
Semester :	4th	
Module coordinator :	Riser Fahdiran, M.Si	
Lecturer(s) :	Riser Fahdiran, M.Si Lari Andres Sanjaya, M.Pd	
Language :	Indonesian	
Classification within the curriculum :	Compulsory course	
Type of Teaching	Contact hours per week during the semester	Class Size
Lecture (Expository, discussion, exercise)	200 minutes	40
Workload	Total workload of this course 181,3 hours (6 ECTS) per semester which consist of 53,4 hours (1.76ECTS) classroom activity, 64 hours (2,12 ECTS) structured task, and 64 hours (2,12 ECTS) per semester.	
Credit points :	6 ECTS	
Prerequisite course(s) :	-	
Course Outcomes :	After taking this course the student have ability to : CLO108. Able to produce vibration system design. CLO109. Able to produce a wave generating system design. CLO110. Able to produce appropriate waves Able to apply basic electrical concepts to solve related technology problems.	
Content :	1. Oscillations • Free harmonic oscillations, damped oscillations, forced oscillations and oscillations, damped oscillations, forced oscillations and coupled oscillations. oscillations. • Formulation of general oscillation equations free, damped, forced and coupled. • Analysis of simple harmonic oscillations, damped oscillations, forced oscillations and coupled oscillations in various applications. 2. Traveling Wave • Physical concept of traveling wave. • Formulation of general equation of of mechanical waves. • Definition of mechanical wave transverse	

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Reflected and transmitted waves Free harmonic oscillation, damped oscillation, forced oscillation and coupled oscillation.
Analysis of wave superposition and wave group.
Stationary wave analysis
Definition of mechanical wave longitudinal
Analysis of wave propagation in solid, search and gas medium.
Analysis of mechanical wave applications running.
Waves on transmission lines.
Two- and three-dimensional waves

3. Electromagnetic waves

Maxwell's equations
General formulation of waves electromagnetic waves
Formulation of wave propagation in a medium.
Reflection and transmission of electromagnetic waves.

4. Superposition of waves

Fourier and delta dirac rule rules in wave analysis.
Amplitude and frequency modulation of of waves.
Analysis of superposition application of waves.

5. Interference and diffraction

Definition of diffraction and interference of of electromagnetic waves.
Diffraction and interference of electromagnetic waves electromagnetic waves in a single slit slit.
Diffraction and interference of electromagnetic waves electromagnetic waves in a double slit.
Diffraction and interference of electromagnetic waves electromagnetic waves in multiple slits multiple slits.
Analysis of applications of diffraction and wave interference.

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<td>Study/exam achievements:</td>
<td>Examination are conducted as unit test, as following
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<tr><th>No</th><th>Assesment Object</th><th>Assesment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>Individual Assignment</td><td>Written test</td><td>10%</td></tr>
<tr><td>2</td><td>Group Paper</td><td>Presentation</td><td>10%</td></tr>
<tr><td>3</td><td>Group Presentation</td><td>Discussion</td><td>10%</td></tr>
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<tr><td>4</td><td>Midterm Test</td><td>Written test</td><td>35%</td></tr>
<tr><td>5</td><td>Final Test</td><td>Written test</td><td>35%</td></tr>
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<tr><td>Media :</td><td>Laptop/Computer, Epsilon Laptop/Computer (E-Learning Study Program), Projector, Video Conference Software Projector: Zoom Meeting/Ms Team, Office Software Reference Book</td></tr>
<tr><td>Literatures :</td><td>
A.P. French (1971) Vibration and waves: the MIT introductory physics series. W.W. Norton & Company.inc. New York.
Hayden, H.W. 1965. The structure and Properties of Material. John Wiley and sons, Inc
Tjia May On. (1994). Gelombang. Solo: Dabara Publisher (Jurusan Fisika ITB)
Hirose, A., Lonngren, K.E. (1985). Introduction to Wave Phenomena. New York: John Wiley & sons
Subrahmanyam, N., Lal, B. (1994). Wave and Oscillation. 2nd ed. New Delhi: Vikas Publishing
Pratama, M., Umiatin, Taryudi (2020). Studi Karakteristik Kavitasi Larutan Menggunakan Metode Gelombang Berdiri Ultrasonik, Prosiding Seminar Nasional Fisika (E-Journal) SNF2020
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