DESIRED LEARNING OUTCOMES	COURSE CONTENT/SUBJECT MATTER	TEXTBOOKS/REFERENCES	TEACHING AND LEARNING ACTIVITIES (TLAS)	ASSESSMENT TASKS (AT_S)	RESOURCE MATERIALS	TIMETABLE
At the end of the unit, the students must have: a.developed the awareness of the importance of the mission, vision, goals, and objectives of the university.	**UNIT 0** • The University Vision, Mission, Core Values, and Outcomes	University Code Student Handbook Bulletin of Information Course Syllabus Course Guide https://www.isatu.edu.ph/	• Individualized Learning • Synchronous/Asynchronous Discussion	Oral Questioning	• Slide presentation • Youtube	1 hr. Week 1
At the end of each topic, the students must have: a. described oscillation and simple harmonic motion in terms of amplitude, period, frequency, and angular frequency;	**UNIT I** **Periodic Motion and Mechanical waves** A. Describing oscillation and Simple Harmonic Motion B. Energy and Applications in Simple Harmonic Motion C. The Simple Pendulum and Types of Mechanical Waves D. Periodic Waves and the Mathematical Description of a Wave	Giancoli, D.C. (2005). Physics: Principles with Application 6th Edition. Pearson Education, Inc. Young, H. D., Freedman, R. A., & Ford, L. A. (2016). *Sears and Zemansky's: University Physics with Modern Physics* (14th ed.). Pearson Education, Inc. **SUGGESTED READINGS:** "Properties of Periodic Motion" at www.physicsclassroom.com "Oscillations and Mechanical Waves" at www.khanacademy.org	• Individualized Learning • Synchronous/Asynchronous Discussion	**Laboratory At Home Activities** **RECAST Activities in Physics** Problem Sets/Short Quizzes thru Quiziz	Learning Vibration and Light: The Physics of Waves and Optics Learning Modules Youtube Laptop/Desktop/Tablet Speaker FB Social Learning Group Zoom Meeting Classroom (Online Class platform) Messenger	11 hrs. Week 1 - 4

b. discussed the energy and application in Simple Harmonic Motion; c. understood the nature of the simple pendulum; d. identified some real life applications of the simple pendulum; e. discussed the types of mechanical waves; f. identified and differentiate the parts of a periodic wave; g. described the wave mathematically; h. explained the speed of a transverse wave and energy in wave motion; and	E. Speed of Transverse Wave and Energy in Wave Motion F. Wave Interference, Boundary Conditions, and Superposition G. Standing Waves and Normal Modes of a String				Slide presentations by Edsel O. Coronado	

i. solved related problems in oscillation and Simple Harmonic Motion, Simple Pendulum, Periodic Waves and the Mathematical Description of a Wave, Speed of Transverse Wave and Energy in Wave Motion, Wave Interference, Boundary Conditions, and Superposition, and Standing Waves and Normal Modes of a String.						
At the end of each topic, the students must have: a. described a sound wave in terms of either particle displacements or pressure;	**UNIT II** **Sound and Hearing** A. The Nature of Sound Waves and Sound Intensity B. Standing Sound Waves and Normal Modes C. Resonance and Sound D. Interference of Waves E. Beats, The Doppler Effect, and Shock Waves	Giancoli, D.C. (2005). Physics: Principles with Application 6th Edition. Pearson Education, Inc. Young, H. D., Freedman, R. A., & Ford, L. A. (2016). *Sears and Zemansky's: University Physics with Modern Physics* (14th ed.). Pearson Education, Inc. **SUGGESTED READINGS:** "Hear and There: Sounds Everywhere" by Henning, Sabbic, & Hout, 2018 at https://kids.frontiersin.org/articles/10.3389/frym.2018.00063 "How the ear works" at https://www.hearinglink.org/your-hearing/about-hearing/how-the-ear-works/	• Individualized Learning • Synchronous/Asynchronous Discussion	**Laboratory At Home Activities** **RECAST Activities in Physics** Problem Sets/Short	Learning Vibration and Light: The Physics of Waves and Optics Learning Modules Youtube Laptop/Desktop/Tablet Speaker FB Social Learning Group	9 hrs. Week 5 - 7

b. explored the concepts of standing waves and normal modes; c. explained what happens when sound waves from different sources overlap; d. discussed resonance and interference of sound waves; e. described beats, the doppler effect, and shockwaves; f. explained real life phenomena associated with beats, the doppler effect, and shockwaves; and g. solved related problems in sound waves and sound intensity, standing sound waves and normal modes,				Quizzes thru Quiziz	Zoom Meeting Classroom (Online Class platform) Messenger Slide presentations by Edsel O. Coronado	

resonance, interference of waves, beats, the doppler effect, and shock waves.						
At the end of each topic, the students must have: a. explained Maxwell's Equations and electromagnetic waves; b. discussed plane electromagnetic waves and the speed of light; c. described energy and momentum in electromagnetic waves; and d. solved related problems in Maxwell's Equations and Electromagnetic Waves, Plane Electromagnetic Waves and the Speed of Light,	**UNIT III** **Electromagnetic Waves** A. Maxwell's Equations and Electromagnetic Waves B. Plane Electromagnetic Waves and the Speed of Light C. Energy and Momentum in Electromagnetic Waves	Giancoli, D.C. (2005). Physics: Principles with Application 6th Edition. Pearson Education, Inc. Young, H. D., Freedman, R. A., & Ford, L. A. (2016). *Sears and Zemansky's: University Physics with Modern Physics* (14th ed.). Pearson Education, Inc. **SUGGESTED READINGS:** "Anatomy of the Electromagnetic Waves" at https://science.nasa.gov/ems/02_anatomy "Electromagnetic Radiation" at https://www.britannica.com/science/electromagnetic-radiation	• Individualized Learning • Synchronous/Asynchronous Discussion	**Laboratory At Home Activities** **RECAST Activities in Physics** Problem Sets/Short Quizzes thru Quiziz	Learning Vibration and Light: The Physics of Waves and Optics Learning Modules Youtube Laptop/Desktop/Tablet Speaker FB Social Learning Group Zoom Meeting Classroom (Online Class platform) Messenger Slide presentations by Edsel O. Coronado	5 hrs. Week 8 - 9

and Energy and Momentum in Electromagnetic Waves.						
At the end of the examination, the students must have achieved 75% from the Midterm Examination	Topics from Unit I to III	References from Unit I to III	Conduct of Midterm Examination thru ISAT U Virtual Learning Environment	Midterm Examination Topic Presentation	ISAT U Virtual Learning Environment Assessment Tool	1 hr. Week 9
At the end of each topic, the students must have: a. explained the nature of light; b. discussed reflection and refraction; c. described dispersion and polarization; d. explained the phenomenon of scattering of light and Huygen's Principle; and e. solved related problems in reflection and refraction.	**UNIT IV** **The Nature and Propagation of Light** A. The Nature of Light B. Reflection and Refraction C. Dispersion and Polarization D. Scattering of Light and Huygen's Principle	Giancoli, D.C. (2005). Physics: Principles with Application 6th Edition. Pearson Education, Inc. Young, H. D., Freedman, R. A., & Ford, L. A. (2016). *Sears and Zemansky's: University Physics with Modern Physics* (14th ed.). Pearson Education, Inc. **SUGGESTED READINGS:** "The Nature of Light" at https://physics.info/light/summary.shtml	• Individualized Learning • Synchronous/Asynchronous Discussion	**Laboratory At Home Activities** **RECAST Activities in Physics** Problem Sets/Short Quizzes thru Quiziz	Learning Vibration and Light: The Physics of Waves and Optics Learning Modules Youtube Laptop/Desktop/Tablet Speaker FB Social Learning Group Zoom Meeting Classroom (Online Class platform) Messenger Slide presentations by Edsel O. Coronado	6 hrs. Week 10-11

At the end of each topic, the students must have: a. explained reflection and refraction in a plane surface; b. explained reflection and refraction in a spherical surface; c. discussed the applications of geometric optics in thin lenses, cameras, the eye, magnifier, microscopes, and telescopes; and d. solved related problems in reflection and refraction in a plane surface and spherical surface.	**UNIT V** **Geometric Optics** A. Reflection and Refraction in a Plane Surface B. Reflection and Refraction in a Spherical Surface C. Thin Lenses and Cameras D. The Eye and The Magnifier E. Microscopes and Telescopes	Giancoli, D.C. (2005). Physics: Principles with Application 6th Edition. Pearson Education, Inc. Young, H. D., Freedman, R. A., & Ford, L. A. (2016). *Sears and Zemansky's: University Physics with Modern Physics* (14th ed.). Pearson Education, Inc. **SUGGESTED READINGS:** "Introduction to Geometric Optics" at https://courses.lumenlearning.com/physics/chapter/introduction-10/	• Individualized Learning • Synchronous/Asynchronous Discussion	**Laboratory At Home Activities** **RECAST Activities in Physics** Problem Sets/Short Quizzes thru Quiziz	Learning Vibration and Light: The Physics of Waves and Optics Learning Modules Youtube Laptop/Desktop/Tablet Speaker FB Social Learning Group Zoom Meeting Classroom (Online Class platform) Messenger Slide presentations by Edsel O. Coronado	12 hrs. Week 12 - 15

At the end of each topic, the students must have: a. identified interference and coherent sources; b. described two-source interference of light; c. discussed intensity in interference patterns; d. explained Fresnel and Fraunhofer Diffraction; and e. explained diffraction from a single and multiple slits.	**UNIT VI** **Interference and Diffraction** A. Interference and Coherent Sources B. Two-Source Interference of Light C. Intensity in Interference Patterns D. Fresnel and Fraunhofer Diffraction E. Diffraction from a Single and Multiple Slits	Giancoli, D.C. (2005). Physics: Principles with Application 6th Edition. Pearson Education, Inc. Young, H. D., Freedman, R. A., & Ford, L. A. (2016). *Sears and Zemansky's: University Physics with Modern Physics* (14th ed.). Pearson Education, Inc. **SUGGESTED READINGS:** "Diffraction and Interference" at http://electron6.phys.utk.edu/phys250/modules/module%201/diffraction_and_interference.htm	• Individualized Learning • Synchronous/Asynchronous Discussion	**Laboratory At Home Activities** **RECAST Activities in Physics** Problem Sets/Short Quizzes thru Quiziz	Learning Vibration and Light: The Physics of Waves and Optics Learning Modules Youtube Laptop/Desktop/Tablet Speaker FB Social Learning Group Zoom Meeting Classroom (Online Class platform) Messenger Slide presentations by Edsel O. Coronado	8 hrs. Week 16 - 18
At the end of the examination, the students must have achieved 75% from the Final Examination	Topics from Unit IV to VI	References from Unit IV to VI	Conduct of Midterm Examination thru ISAT U Virtual Learning Environment	Final Examination	ISAT U Virtual Learning Environment Assessment Tool	1 hr. Week 18

X. LEARNING PLAN: