KOLEJ MATRIKULASI SARAWAK
LESSON PLAN
SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	1			
CHAPTER	Chapter: 1: PHYSICAL QUANTITIES AND MEASUREMENTS			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 02/08/2021(T5A); 02/08/2021(T5B); 03/08/2021(T6A); 03/08/2021(T6A)	1.1a) Define dimension. 1.1b) Determine the dimensions of derived quantities. 1.1c) Verify the homogeneity of equations using dimensional analysis.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 5 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

Prepared by,

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CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 03/08/2021(T5A); 03/08/2021(T5B); 04/08/2021(T6A); 04/08/2021(T6A)	1.2a) Define scalar and vector quantities. 1.2b) Resolve vector into two perpendicular components (x and y axes). 1.2c) Determine resultant of vectors. (remarks: limit to three vectors only).	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 6 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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05/08/2021(T5A); 05/08/2021(T5B); 05/08/2021(T6A); 05/08/2021(T6A)</td><td colspan="2">1.3a) State the significant figures of a given number.
1.3b) Use the rules for stating the significant figures at the end of a calculation (addition, subtraction, multiplication or division).
1.3c) Determine the uncertainty for average value and derived quantities.
1.3d) Calculate basic combination (propagation) of uncertainties.
1.3e) State the sources of uncertainty in the results of an experiment.
1.3f) Draw a linear graph and determine its gradient, y-intercept and its respective uncertainties. (remarks: using Least Square Method LSM to determine uncertainties)
1.3g) Measure and determine the uncertainty of physical quantities. (Experiment 1: Measurement and uncertainty)</td><td>Discussions

Thought Experiments

Activities</td><td><table><tr><th>ITEM
*Appendix</th><th>SCORE</th></tr><tr><td>i</td><td>5</td></tr><tr><td>ii</td><td>6</td></tr><tr><td>iii</td><td>6</td></tr><tr><td>iv</td><td>6</td></tr><tr><td>v</td><td>6</td></tr></table></td><td>All objectives achieved. Students are able to understand the materials of the topic.</td></tr>
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SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	2			
CHAPTER	Chapter: 2: KINEMATICS OF MOTIONS			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 09/08/2021(T5A); 09/08/2021(T5B); 10/08/2021(T6A); 10/08/2021(T6A)	2.1a) Define instantaneous velocity, average velocity, uniform velocity, instantaneous acceleration, average acceleration and uniform acceleration. 2.1b) Interpret the physical meaning of displacement-time, velocity-time and acceleration-time graphs. 2.1c) Determine the distance travelled, displacement, velocity and acceleration from appropriate graphs.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 6 **iv** 5 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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<tr><td>MODE</td><td colspan="5">TUTORIAL</td></tr>
<tr><td>CLO</td><td colspan="5">CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.</td></tr>
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<tr><td>T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1)

10/08/2021(T5A); 10/08/2021(T5B); 11/08/2021(T6A); 11/08/2021(T6A)</td><td colspan="2">2.2a) Derive and apply equations of motion with uniform acceleration (Refer equation 1)</td><td>Discussions

Thought Experiments

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	2			
CHAPTER	Chapter: 2: KINEMATICS OF MOTIONS			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 12/08/2021(T5A); 12/08/2021(T5B); 12/08/2021(T6A); 12/08/2021(T6A)	2.2a) Derive and apply equations of motion with uniform acceleration (Refer equation 1)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 6 **iv** 5 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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<tr><td>MODE</td><td colspan="5">TUTORIAL</td></tr>
<tr><td>CLO</td><td colspan="5">CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.</td></tr>
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<tr><td>T5A(MON, 1100hrs, DK1),
T5B(MON, 1200 hrs, DK1),
T6A(TUE, 0800 hrs, BT1),
T6B(TUE, 1400 hrs, BT1)

16/08/2021(T5A); 16/08/2021(T5B);
17/08/2021(T6A); 17/08/2021(T6A)</td><td colspan="2">2.2a) Derive and apply equations of motion with uniform acceleration (Refer equation 1)</td><td>Discussions

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<tr><td>T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1)

17/08/2021(T5A); 17/08/2021(T5B); 18/08/2021(T6A); 18/08/2021(T6A)</td><td colspan="2">2.3a) Describe projectile motion launched at an angle, O as well as special cases when 0=0°
2.3b) Solve problems related to projectile motion.
2.3c) Determine the acceleration due to gravity, g using free fall and projectile motion. (Experiment 2: Free fall and projectile motion)</td><td>Discussions

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SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	3			
CHAPTER	Chapter: 2: KINEMATICS OF MOTIONS			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 19/08/2021(T5A); 19/08/2021(T5B); 19/08/2021(T6A); 19/08/2021(T6A)	2.3a) Describe projectile motion launched at an angle, O as well as special cases when 0=0° 2.3b) Solve problems related to projectile motion. 2.3c) Determine the acceleration due to gravity, g using free fall and projectile motion. (Experiment 2: Free fall and projectile motion)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 6 **iii** 5 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	4			
CHAPTER	Chapter: 3: DYNAMICS OF LINEAR MOTION			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 23/08/2021(T5A); 23/08/2021(T5B); 24/08/2021(T6A); 24/08/2021(T6A)	3.1a) Define momentum and impulse (Refer Equation 2) 3.1b) Solve 1D problems related to impulse and impulse-momentum theorem (Refer Equation 2)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 5 **iv** 5 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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<tr><td>WEEK</td><td colspan="5">4</td></tr>
<tr><td>CHAPTER</td><td colspan="5">Chapter: 3: DYNAMICS OF LINEAR MOTION</td></tr>
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24/08/2021(T5A); 24/08/2021(T5B); 25/08/2021(T6A); 25/08/2021(T6A)</td><td colspan="2">3.1c) Use F-t graph to determine impulse.</td><td>Discussions

Thought Experiments

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26/08/2021(T5A); 26/08/2021(T5B); 26/08/2021(T6A); 26/08/2021(T6A)</td><td colspan="2">3.2a) State the principle of conservation of linear momentum.
3.2b) Apply the principle of conservation of momentum in elastic and inelastic collisions in 2D collisions.
3.2c) Differentiate elastic and inelastic collisions. (remarks: similarities & differences)</td><td>Discussions

Thought Experiments

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T6B(TUE, 1400 hrs, BT1)

30/08/2021(T5A); 30/08/2021(T5B);
31/08/2021(T6A); 31/08/2021(T6A)</td><td colspan="2">3.3a) Identify the forces acting on a body in different situations – Weight, W; Tension, T; Normal force, N; Friction, f; and External force (pull or push), F.
3.3b) Sketch free body diagram.
3.3c) Determine static and kinetic friction (Refer Equation 3)</td><td>Discussions

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	5			
CHAPTER	Chapter: 3: DYNAMICS OF LINEAR MOTION			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 31/08/2021(T5A); 31/08/2021(T5B); 01/09/2021(T6A); 01/09/2021(T6A)	3.4a) State Newton's laws of motion. 3.4b) Apply Newton's laws of motion – Include static and dynamic equilibrium for Newton's first law motion	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 5 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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MARY GWADOLINE YUSUS
Head of the Physics Unit
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Date:

KOLEJ MATRIKULASI SARAWAK
LESSON PLAN
SEMESTER I SESSION 2021/2022

<table>
<tr><td>LECTURER</td><td colspan="5">SHAFIQ BIN RASULAN</td></tr>
<tr><td>CODE / COURSE</td><td colspan="5">SP015</td></tr>
<tr><td>WEEK</td><td colspan="5">5</td></tr>
<tr><td>CHAPTER</td><td colspan="5">Chapter: 3: DYNAMICS OF LINEAR MOTION</td></tr>
<tr><td>MODE</td><td colspan="5">TUTORIAL</td></tr>
<tr><td>CLO</td><td colspan="5">CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.</td></tr>
<tr><td>SLT</td><td>F2F (hour):</td><td>1</td><td>NF2F (hour):</td><td colspan="2">1</td></tr>
<tr><td>CLASS
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DATE</td><td colspan="2">LEARNING OUTCOME</td><td>T&L STRATEGIES & TOOLS</td><td>REFLECTION</td><td>REMARKS</td></tr>
<tr><td>T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1)

02/09/2021(T5A); 02/09/2021(T5B); 02/09/2021(T6A); 02/09/2021(T6A)</td><td colspan="2">3.4a) State Newton's laws of motion.
3.4b) Apply Newton's laws of motion – Include static and dynamic equilibrium for Newton's first law motion</td><td>Discussions

Thought Experiments

Activities</td><td><table><tr><th>ITEM
*Appendix</th><th>SCORE</th></tr><tr><td>i</td><td>5</td></tr><tr><td>ii</td><td>5</td></tr><tr><td>iii</td><td>5</td></tr><tr><td>iv</td><td>6</td></tr><tr><td>v</td><td>5</td></tr></table></td><td>All objectives achieved. Students are able to understand the materials of the topic.</td></tr>
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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	6			
CHAPTER	Chapter: 4: WORK, ENERGY AND POWER			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 06/09/2021(T5A); 06/09/2021(T5B); 07/09/2021(T6A); 07/09/2021(T6A)	4.1a) State the physical meaning of dot (scalar) product for work (Refer Equation 4) 4.1b) Define and apply work done by a constant force. 4.1c) Determine work done from a force-displacement graph.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 6 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	6			
CHAPTER	Chapter: 4: WORK, ENERGY AND POWER			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 07/09/2021(T5A); 07/09/2021(T5B); 08/09/2021(T6A); 08/09/2021(T6A)	4.2a) Define and use: Gravitational potential energy, Elastic potential energy for spring, Kinetic energy (Refer Equation 5) 4.2b) State the principle of conservation of energy. 4.2c) Apply the principle of conservation of mechanical energy. d) State and apply work-energy theorem (Refer Equation 5)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 6 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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<tr><td>WEEK</td><td colspan="5">6</td></tr>
<tr><td>CHAPTER</td><td colspan="5">Chapter: 4: WORK, ENERGY AND POWER</td></tr>
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09/09/2021(T5A); 09/09/2021(T5B); 09/09/2021(T6A); 09/09/2021(T6A)</td><td colspan="2">4.2a) Define and use: Gravitational potential energy, Elastic potential energy for spring, Kinetic energy (Refer Equation 5)
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<tr><td>WEEK</td><td colspan="5">7</td></tr>
<tr><td>CHAPTER</td><td colspan="5">Chapter: 4: WORK, ENERGY AND POWER</td></tr>
<tr><td>MODE</td><td colspan="5">TUTORIAL</td></tr>
<tr><td>CLO</td><td colspan="5">CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.</td></tr>
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DATE</td><td colspan="2">LEARNING OUTCOME</td><td>T&L STRATEGIES & TOOLS</td><td>REFLECTION</td><td>REMARKS</td></tr>
<tr><td>T5A(MON, 1100hrs, DK1),
T5B(MON, 1200 hrs, DK1),
T6A(TUE, 0800 hrs, BT1),
T6B(TUE, 1400 hrs, BT1)

13/09/2021(T5A); 13/09/2021(T5B);
14/09/2021(T6A); 14/09/2021(T6A)</td><td colspan="2">4.3a) Define and use average power, and instantaneous power (Refer Equation 6)
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<tr><td>T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1)

14/09/2021(T5A); 14/09/2021(T5B); 15/09/2021(T6A); 15/09/2021(T6A)</td><td colspan="2">4.3a) Define and use average power, and instantaneous power (Refer Equation 6)
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Thought Experiments

Activities</td><td><table><tr><th>ITEM
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<tr><td>T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1)

16/09/2021(T5A); 16/09/2021(T5B); 16/09/2021(T6A); 16/09/2021(T6A)</td><td colspan="2">4.3a) Define and use average power, and instantaneous power (Refer Equation 6)
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LESSON PLAN
SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	8			
CHAPTER	Chapter: 5: CIRCULAR MOTION			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 20/09/2021(T5A); 20/09/2021(T5B); 21/09/2021(T6A); 21/09/2021(T6A)	5.1a) Define and use – angular displacement, period, frequency, angular velocity	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 5 **iii** 5 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	8			
CHAPTER	Chapter: 5: CIRCULAR MOTION			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 21/09/2021(T5A); 21/09/2021(T5B); 22/09/2021(T6A); 22/09/2021(T6A)	5.2a) Describe uniform circular motion. 5.2b) Convert units between degrees, radian, and revolution or rotation.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	8			
CHAPTER	Chapter: 5: CIRCULAR MOTION			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 23/09/2021(T5A); 23/09/2021(T5B); 23/09/2021(T6A); 23/09/2021(T6A)	5.3a) Explain centripetal acceleration and centripetal force (Refer Equation 7) 5.3b) Solve problems related to centripetal force for uniform circular motion cases: horizontal circular motion, vertical circular motion and conical pendulum, exclude banked curve	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 5 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	9			
CHAPTER	Chapter: 6: ROTATION OF RIGID BODY			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 27/09/2021(T5A); 27/09/2021(T5B); 28/09/2021(T6A); 28/09/2021(T6A)	6.1a) Define and use – angular displacement, average angular velocity, instantaneous angular velocity, average angular acceleration, instantaneous angular acceleration. (Refer Equation 8) 6.1b) Analyse parameters in rotational motion with their corresponding quantities in linear motion (Refer Equation 8) 6.1c) Solve problem related to rotational motion with constant angular acceleration (Refer Equation 8)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 6 **iv** 5 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	9			
CHAPTER	Chapter: 6: ROTATION OF RIGID BODY			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 28/09/2021(T5A); 28/09/2021(T5B); 29/09/2021(T6A); 29/09/2021(T6A)	6.2a) State the physical meaning of cross (vector) product for torque, (Refer Equation 9) 6.2b) Define and apply torque. 6.2c) State conditions for equilibrium of rigid body 6.2d) Solve problems related to equilibrium of a uniform rigid body, limit to 5 forces.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 6 **iv** 5 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	9			
CHAPTER	Chapter: 6: ROTATION OF RIGID BODY			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 30/09/2021(T5A); 30/09/2021(T5B); 30/09/2021(T6A); 30/09/2021(T6A)	6.2a) State the physical meaning of cross (vector) product for torque, (Refer Equation 9) 6.2b) Define and apply torque. 6.2c) State conditions for equilibrium of rigid body 6.2d) Solve problems related to equilibrium of a uniform rigid body, limit to 5 forces.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 6 **iii** 5 **iv** 5 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	10			
CHAPTER	Chapter: 6: ROTATION OF RIGID BODY			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 11/10/2021(T5A); 11/10/2021(T5B); 12/10/2021(T6A); 12/10/2021(T6A)	6.3a) Define and use moment of inertia (Refer Equation 10) 6.3b) Use the moment of inertia of a uniform rigid body. (sphere, cylinder, ring, disc, and rod). 6.3c) Determine the moment of inertia of a flywheel. (Experiment 4: Rotational motion of rigid body) d) State and use net torque (Refer Equation 10)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 6 **iv** 5 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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KOLEJ MATRIKULASI SARAWAK
LESSON PLAN
SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	10			
CHAPTER	Chapter: 6: ROTATION OF RIGID BODY			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 12/10/2021(T5A); 12/10/2021(T5B); 13/10/2021(T6A); 13/10/2021(T6A)	6.4a) Explain and use angular momentum (Refer Equation 11) 6.4b) State and use principle of conservation of angular momentum.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 6 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

Prepared by,

SHAFIQ BIN RASULAN
Physics Lecturer
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Endorsed by,

MARY GWADOLINE YUSUS
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LESSON PLAN
SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	10			
CHAPTER	Chapter: 6: ROTATION OF RIGID BODY			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 14/10/2021(T5A); 14/10/2021(T5B); 14/10/2021(T6A); 14/10/2021(T6A)	6.4a) Explain and use angular momentum (Refer Equation 11) 6.4b) State and use principle of conservation of angular momentum.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 6 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	11			
CHAPTER	Chapter: 7: OSCILLATIONS AND WAVES			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 18/10/2021(T5A); 18/10/2021(T5B); 19/10/2021(T6A); 19/10/2021(T6A)	7.1a) Explain SHM. 7.1b) Apply SHM displacement equation (Refer Equation 12) 7.1c) Derive (without calculus) and use equations – velocity, acceleration, kinetic energy, and potential energy (Refer Equation 12) 7.1d) Emphasise the relationship between total SHM energy and amplitude. 7.1e) Apply equations of velocity, acceleration, kinetic energy and potential energy for SHM.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 5 **iii** 5 **iv** 5 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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<tr><td>CHAPTER</td><td colspan="5">Chapter: 7: OSCILLATIONS AND WAVES</td></tr>
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19/10/2021(T5A); 19/10/2021(T5B); 20/10/2021(T6A); 20/10/2021(T6A)</td><td colspan="2">7.2a) Analyse the following graphs – displacement-time, velocity-time, acceleration-time and energy-displacement.</td><td>Discussions

Thought Experiments

Activities</td><td><table><tr><th>ITEM
*Appendix</th><th>SCORE</th></tr><tr><td>i</td><td>6</td></tr><tr><td>ii</td><td>5</td></tr><tr><td>iii</td><td>6</td></tr><tr><td>iv</td><td>6</td></tr><tr><td>v</td><td>6</td></tr></table></td><td>All objectives achieved. Students are able to understand the materials of the topic.</td></tr>
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21/10/2021(T5A); 21/10/2021(T5B); 21/10/2021(T6A); 21/10/2021(T6A)</td><td colspan="2">7.3a) Use expression for period of SHM, for simple pendulum and mass-spring system – Simple pendulum and mass-spring system (Refer Equation 13)
7.3b) Determine the acceleration, g due to gravity using simple pendulum.(Experiment 5: SHM)
7.3c) Investigate the effect of large amplitude oscillation to the accuracy of acceleration due to gravity, g obtained from the experiment. (Experiment 5: SHM)</td><td>Discussions

Thought Experiments

Activities</td><td><table><tr><th>ITEM *Appendix</th><th>SCORE</th></tr><tr><td>i</td><td>5</td></tr><tr><td>ii</td><td>5</td></tr><tr><td>iii</td><td>5</td></tr><tr><td>iv</td><td>5</td></tr><tr><td>v</td><td>6</td></tr></table></td><td>All objectives achieved. Students are able to understand the materials of the topic.</td></tr>
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SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	12			
CHAPTER	Chapter: 7: OSCILLATIONS AND WAVES			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 25/10/2021(T5A); 25/10/2021(T5B); 26/10/2021(T6A); 26/10/2021(T6A)	7.4a) Define wavelength. 7.4b) Define and use wave number (Refer Equation 14) 7.4c) Solve problems related to equation of progressive wave (Refer Equation 14) 7.4d) Distinguish between particle vibrational velocity and wave propagation velocity. 7.4e) Use particle vibrational velocity (Refer Equation 14) 7.4f) Use wave propagation velocity (Refer Equation 14) 7.4g) Analyse the graphs of – displacement-time and displacement-distance	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 5 **iii** 6 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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<tr><td>CHAPTER</td><td colspan="5">Chapter: 7: OSCILLATIONS AND WAVES</td></tr>
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26/10/2021(T5A); 26/10/2021(T5B); 27/10/2021(T6A); 27/10/2021(T6A)</td><td colspan="2">7.5a) State the principle of superposition of waves for the constructive and destructive interferences.
7.5b) Use the standing wave equation (Refer Equation 15)
7.5c) Compare between progressive waves and standing waves.</td><td>Discussions

Thought Experiments

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LESSON PLAN
SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	12			
CHAPTER	Chapter: 7: OSCILLATIONS AND WAVES			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 28/10/2021(T5A); 28/10/2021(T5B); 28/10/2021(T6A); 28/10/2021(T6A)	7.5a) State the principle of superposition of waves for the constructive and destructive interferences. 7.5b) Use the standing wave equation (Refer Equation 15) 7.5c) Compare between progressive waves and standing waves.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 6 **iv** 5 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 01/11/2021(T5A); 01/11/2021(T5B); 02/11/2021(T6A); 02/11/2021(T6A)	7.6a) Solve problems related to the fundamental and overtone frequencies for stretched string and air columns (open and closed end). (Refer Equation 16) 7.6b) Use wave speed in a stretched string (Refer Equation 16) 7.6c) Investigate standing wave formed in a stretched string. (Experiment 6: Standing waves) 7.6d) Determine the mass per unit length of the string. (Experiment 6: Standing waves)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 5 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 02/11/2021(T5A); 02/11/2021(T5B); 03/11/2021(T6A); 03/11/2021(T6A)	7.6a) Solve problems related to the fundamental and overtone frequencies for stretched string and air columns (open and closed end). (Refer Equation 16) 7.6b) Use wave speed in a stretched string (Refer Equation 16) 7.6c) Investigate standing wave formed in a stretched string. (Experiment 6: Standing waves) 7.6d) Determine the mass per unit length of the string. (Experiment 6: Standing waves)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 6 **iv** 6 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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CODE / COURSE	SP015			
WEEK	13			
CHAPTER	Chapter: 7: OSCILLATIONS AND WAVES			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 04/11/2021(T5A); 04/11/2021(T5B); 04/11/2021(T6A); 04/11/2021(T6A)	7.6a) Solve problems related to the fundamental and overtone frequencies for stretched string and air columns (open and closed end). (Refer Equation 16) 7.6b) Use wave speed in a stretched string (Refer Equation 16) 7.6c) Investigate standing wave formed in a stretched string. (Experiment 6: Standing waves) 7.6d) Determine the mass per unit length of the string. (Experiment 6: Standing waves)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 5 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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LESSON PLAN
SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	14			
CHAPTER	Chapter: 7: OSCILLATIONS AND WAVES			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 08/11/2021(T5A); 08/11/2021(T5B); 09/11/2021(T6A); 09/11/2021(T6A)	7.7a) State Doppler Effect for sound waves. 7.7b) Apply Doppler Effect equation for relative motion between source and observer. Limit to stationary observer and moving source, and vice versa. (Refer Equation 17)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 6 **iv** 5 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	14			
CHAPTER	Chapter: 7: OSCILLATIONS AND WAVES			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
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<tr><td>CHAPTER</td><td colspan="5">Chapter: 7: OSCILLATIONS AND WAVES</td></tr>
<tr><td>MODE</td><td colspan="5">TUTORIAL</td></tr>
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11/11/2021(T5A); 11/11/2021(T5B); 11/11/2021(T6A); 11/11/2021(T6A)</td><td colspan="2">7.7a) State Doppler Effect for sound waves.
7.7b) Apply Doppler Effect equation for relative motion between source and observer. Limit to stationary observer and moving source, and vice versa. (Refer Equation 17)</td><td>Discussions

Thought Experiments

Activities</td><td><table><tr><th>ITEM
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SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	15			
CHAPTER	Chapter: 8: PHYSICS OF MATTER			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 15/11/2021(T5A); 15/11/2021(T5B); 16/11/2021(T6A); 16/11/2021(T6A)	8.1a) Distinguish between stress and strain for tensile and compression force. (Refer Equation 18) 8.1b) Analyse the graph of stress-strain, σ & for a metal under tension. 8.1c) Explain elastic and plastic deformations. 8.1d) Analyse graph of force-elongation for brittle and ductile materials.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 6 **iii** 5 **iv** 5 **v** 6	All objectives achieved. Students are able to understand the materials of the topic.

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MARY GWADOLINE YUSUS
Head of the Physics Unit
Sarawak Matriculation College
Date:

KOLEJ MATRIKULASI SARAWAK
LESSON PLAN
SEMESTER I SESSION 2021/2022

LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	15			
CHAPTER	Chapter: 8: PHYSICS OF MATTER			
MODE	TUTORIAL			
CLO	CLO2: Solve problems related to mechanics, waves, matter, heat and thermodynamics.			
SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(TUE, 0900hrs, BT1), T5B(TUE, 1500 hrs, MF), T6A(WED, 0800 hrs, BT1), T6B(WED, 0900 hrs, BT1) 16/11/2021(T5A); 16/11/2021(T5B); 17/11/2021(T6A); 17/11/2021(T6A)	8.2a) Define and use Young's Modulus (Refer Equation 19) 8.2b) Apply strain energy from force-elongation graph. (Refer Equation 19) 8.2c) Apply strain energy per unit volume from stress-strain graph. (Refer Equation 19)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 5 **ii** 6 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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LECTURER	SHAFIQ BIN RASULAN			
CODE / COURSE	SP015			
WEEK	16			
CHAPTER	Chapter: 8: PHYSICS OF MATTER			
MODE	TUTORIAL			
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SLT	**F2F (hour):**	1	**NF2F (hour):**	1

CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A(MON, 1100hrs, DK1), T5B(MON, 1200 hrs, DK1), T6A(TUE, 0800 hrs, BT1), T6B(TUE, 1400 hrs, BT1) 22/11/2021(T5A); 22/11/2021(T5B); 23/11/2021(T6A); 23/11/2021(T6A)	8.3a) Define heat conduction. 8.3b) Solve problems related to rate of heat transfer through a cross-sectional area (remarks: maximum two insulated objects in series) (Refer Equation 20) 8.3c) Analyse graphs of temperature-distance (T-L) for heat conduction through insulated and non-insulated rods, maximum two rods in series.	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 6 **iii** 5 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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CLASS (DAY, TIME, VENUE) DATE	**LEARNING OUTCOME**	**T&L STRATEGIES & TOOLS**	**REFLECTION**	**REMARKS**
T5A, T5B, T6A, T6B(THUR, 0800hrs, DK1) 25/11/2021(T5A); 25/11/2021(T5B); 25/11/2021(T6A); 25/11/2021(T6A)	8.4a) Define coefficient of linear expansion, a, area expansion, ß and volume expansion, y 8.4b) Solve problems related to thermal expansion of linear, area and volume, include expansion of liquid in a container. (Refer Equation 21) 9.1a) State the assumptions of kinetic theory of gases. 9.1b) Describe root mean square (rms) speed of gas molecules (Refer Equation 22) 9.1c) Solve problems related to root mean square (rms) speed of gas molecules (Refer Equation 22) 9.1d) Solve problems related to the equations and pressure (Refer Equation 22)	Discussions Thought Experiments Activities	**ITEM** ***Appendix*** / **SCORE** **i** 6 **ii** 5 **iii** 6 **iv** 6 **v** 5	All objectives achieved. Students are able to understand the materials of the topic.

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29/11/2021(T5A); 29/11/2021(T5B);
30/11/2021(T6A); 30/11/2021(T6A)</td><td colspan="2">9.2a) Explain and use translational kinetic energy of a molecule (Refer Equation 23)
9.2b) Define degree of freedom.
9.2c) Identify number of degrees of freedom, f for monoatomic, diatomic and polyatomic gas molecules.
9.2d) State the principle of equipartition of energy.
9.2e) Discuss internal energy of gas.
9.2f) Solve problems related to internal energy (Refer Equation 23)</td><td>Discussions

Thought Experiments

Activities</td><td><table><tr><th>*Appendix</th><th>SCORE</th></tr><tr><td>i</td><td>6</td></tr><tr><td>ii</td><td>6</td></tr><tr><td>iii</td><td>6</td></tr><tr><td>iv</td><td>6</td></tr><tr><td>v</td><td>6</td></tr></table></td><td>All objectives achieved. Students are able to understand the materials of the topic.</td></tr>
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30/11/2021(T5A); 30/11/2021(T5B); 01/12/2021(T6A); 01/12/2021(T6A)</td><td colspan="2">9.3a) State the First Law of Thermodynamics (Refer Equation 24)
9.3b) Solve problem related to First Law of Thermodynamics.
9.4a) Define the following thermodynamic processes – Isothermal, Isochoric, Isobaric and Adiabatic.</td><td>Discussions

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02/12/2021(T5A); 02/12/2021(T5B); 02/12/2021(T6A); 02/12/2021(T6A)</td><td colspan="2">9.4b) Analyse P-V graph for all the thermodynamic processes.
9.5a) Derive equation of work done in isothermal, isochoric and isobaric processes from P-V graph.
9.5b) Solve problem related to work done in isothermal process, isobaric process, and isochoric process (Refer Equation 25)</td><td>Discussions

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