



# JMH Physics 112

## Course Outline January - June 2019

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YouTube: [P. MacDonald](#) (Lectures & Example Problems)  
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### 1: Light

- Waves
- Electromagnetic Spectrum
- Refraction
- Diffraction

### 2: Kinematics

- Vectors
- Mathematical Analysis
- Graphical Analysis: Position-Time
- Graphical Analysis: Velocity-Time

### 3: Dynamics

- Friction
- Net Force
- Newton's Laws
- Kinematics and Dynamics

### 4: Work and Energy

- Work
- Power
- Conservation of Energy
- Work-Energy Theorem

Code	Learning Target Description
LLT1	Describe the properties of transverse and longitudinal waves, apply the wave equation and describe wave interference.
LLT2	Describe the properties and applications of the electromagnetic spectrum.
LLT3	Explain, qualitatively and quantitatively, the phenomenon of refraction and its applications. Use Snell's Law.
LLT4	Explain, qualitatively and quantitatively, the phenomenon of diffraction and its applications.
KLT1	Define and conceptually explain frame of reference; position, velocity and acceleration as vectors.
KLT2	I can analyze the mathematical relationships among position, velocity, acceleration and time.
KLT3	Qualitatively and quantitatively analyze position-time graphs from theoretical and experimental sources.
KLT4	Qualitatively and quantitatively analyze velocity-time graphs from theoretical and experimental sources.
DLT1	Explain static and kinetic friction. Mathematically calculate the force of friction using the coefficient of friction and normal force.
DLT2	Qualitatively, and quantitatively analyze net force incorporating a variety of types of forces (applied, tension, gravity, friction, etc.)
DLT3	Explain and apply Newton's three laws of motion.
DLT4	Explain and calculate problems using concepts from kinematics and dynamics.
WELT1	Analyze quantitatively the relationships among force, distance and work.
WELT2	Analyze quantitatively the relationships among work, time and power.
WELT3	Analyze the relationships among mass, height, speed and heat energy using the law of conservation of energy.
WELT4	Analyze common energy transformation situations using the work-energy theorem.

## Standards-Based Grading: A Six Point Scale

Each unit listed above will have learning targets that will be graded on a six point scale. As a student, you will keep a portfolio of your work towards understanding course concepts. This will be important in determining a percentage grade (which you will only receive on report cards). Tests, quizzes, concept-checks and the exam will all be scored using the system below:

<b>Expert</b>	<b>6</b>	<ul style="list-style-type: none"> <li>Near perfect demonstration of understanding/skill; high confidence; mastery of learning standard.</li> <li>Errors in concepts are identified and eliminated.</li> </ul>	<ul style="list-style-type: none"> <li>“You could teach this!”</li> </ul>
	<b>5</b>	<ul style="list-style-type: none"> <li>Strong demonstration of understanding/skill; high confidence. Slight error involved.</li> <li>Minor concept errors made during assessments.</li> </ul>	<ul style="list-style-type: none"> <li>“Almost perfect!”</li> </ul>
<b>Apprentice</b>	<b>4</b>	<ul style="list-style-type: none"> <li>Good demonstration of understanding/basic skills; confidence evident. A few errors.</li> <li>A few errors and learning gaps of course material.</li> </ul>	<ul style="list-style-type: none"> <li>“Good overall understanding of the course material.”</li> </ul>
	<b>3</b>	<ul style="list-style-type: none"> <li>Satisfactory demonstration of understanding/basic skills; key concepts are lacking. Errors are common.</li> <li>The grasp of course concepts is minimal, but enough of the concepts are understood to pass.</li> </ul>	<ul style="list-style-type: none"> <li>“You are missing many of the key concepts, but have achieved the bare minimum to pass.”</li> </ul>
<b>Novice</b>	<b>2</b>	<ul style="list-style-type: none"> <li>Minimal understanding of key concepts and rudimentary demonstration of basic skills.</li> <li>Not enough concepts understood to pass.</li> </ul>	<ul style="list-style-type: none"> <li>“You are starting to understand.”</li> </ul>
	<b>1</b>	<ul style="list-style-type: none"> <li>Inadequate understanding key concepts and little to no demonstration of basic skills.</li> <li>Errors throughout and/or questions unanswered.</li> </ul>	<ul style="list-style-type: none"> <li>“Credit or pass not possible at this time.”</li> </ul>

Near report card time we will meet and agree on a percentage score (although, as teacher I do have final say based on your work) using the table below:

<b>Learning Category</b>	<b>Classification Level</b>	<b>Only shortly before report cards will a percentage mark be discussed and determined</b>		
<b>Expert</b>	<b>6</b>	<b>95 – 100</b>		
	<b>5</b>	86	90	94
<b>Apprentice</b>	<b>4</b>	73	80	85
	<b>3</b>	60	66	72
<b>Novice</b>	<b>2</b>	50	56	59
	<b>1</b>	0	25	49

Remember, each learning target will be scored 1 – 6 and it will be possible to improve a score through continued practice, conversations, and assignments, projects, re-quizzing and re-testing.