

CURRICULUM GUIDE: OFFICIAL COURSE OUTLINE

Course Code	PHYS 152	Course Title	Oscillations and Waves, Fluids, Heat, and Thermodynamics			
Credit Value	4	Department	Mathematics and Science			
No. of weeks	14	Hrs. per week	<i>Lecture</i>	<i>Tutorial</i>	<i>Laboratory</i>	<i>Total</i>
			3	0	3	6
Course Description	<p>Oscillations, simple harmonic motion, traveling waves and standing waves including sound and light, interference of waves including interference and diffraction, statics and dynamics of fluids, heat, temperature, and calorimetry. This course is calculus-based and intended for students of science and engineering.</p> <p>Students with credit for PHYS 101 or 141 may not take PHYS 152 for further credit</p>					
Prerequisite(s)	ENGL 099, Physics 12 or PHYS 100, MATH 151 (MATH 151 may be taken concurrently)					
Initial Articulation Targets	<i>UBC</i>	<i>SFU</i>	<i>UVic</i>	<i>UNBC</i>	<i>TRU</i>	
	PHYS 157 (3)	PHYS 1XX (4)	PHYS 1XX (3)	PHYS 111 (4)	PHYS 1150 (3)	
	For updated information on the transferability of this course, please consult the BC Transfer Guide, www.bctransferguide.ca					
Learning Outcomes	<p>Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> • Draw free-body diagrams to determine the forces on an object. Forces include gravity, spring force, normal force, friction, drag, and tension. • Predict the motion of objects using Newton's laws and work-energy theorem and conservation of mechanical energy. • Predict the motion of objects undergoing simple harmonic motion. • Explain the differences between traveling waves and standing waves and solving problems using their mathematical representations. • Relate forces to pressure and buoyancy and work-energy theorem to fluids in motion. • Predict results using the laws of thermodynamics and explaining heat transfer mechanisms. • Set-up, record, and analyze data from experiments using uncertainty analysis and compare the results to theory. 					



Content	<p>Core topics – all of the following will be covered:</p> <ul style="list-style-type: none"> • Review of linear kinematics and dynamics • Review of work and energy • Simple harmonic motion • Traveling waves and standing waves • Fluid statics and fluid dynamics • Thermodynamics <p>Labs cover the topic in this course.</p> <p>Additional topics may also be covered, at the discretion of the instructor.</p>		
Methods of Instruction	Lectures, problem sessions, problem assignments, learning activities, assigned reading, quizzes and exams.		
Required Textbook(s)	The following textbook(s) is/are required, or approved equivalent(s). Moebs, William et al. University Physics Volume 1, 2, 3. Houston, TX: OpenStax CNX, 2022.		
Required Equipment and Technology	<p>Students are required to have a computer with internet access.</p> <p>The following resources are provided by the College:</p> <ul style="list-style-type: none"> • Office 365 • Student email 		
Homework Hours	At minimum, students can expect one hour of homework for every hour of instructional time.		
Evaluation	<i>Component</i>	<i>% Value</i>	
	Assignments, quizzes, presentations	10-25%	
	Labs	10-20%	
	Midterm examination(s) (1-2)	20-40%	
	Final examination	30-35%	
Completion Requirements	The minimum grade to pass this course is D (50%). Unless otherwise stated, a minimum grade of C- (55%) is required for this course to fulfil a prerequisite.		
Course Designer(s)	Michael Wortis, Ph.D., Professor Emeritus, Department of Physics, Simon Fraser University	Consultant(s), <i>if applicable</i>	Dugan O'Neil, Ph.D., Department of Physics, Simon Fraser University, Kelly Cheung, Ph.D., (Coordinator) Physics Department, Alexander College, Michael Wortis, Professor Emeritus, Department of Physics, Simon Fraser University
Dean's Approval	Barbara Moon, Ph.D. Dean of Arts and Sciences. Professor Emeritus, Department of Biology, University of the Fraser Valley	Dean's Approval Date	October 15, 2013



Curriculum Committee Approval Date	October 15, 2013	First Term Offered	Spring 2016
Last Review Date	March 1, 2023	Next Review Date	March 1, 2028
Revision History	March 1, 2023-Minor updates (e.g., assessment ranges, textbooks) by Kelly Cheung		