

CURRICULUM GUIDE: OFFICIAL COURSE OUTLINE

Course Code	PHYS 151	Course Title	Mechanics for Engineers			
Credit Value	3	Department	Mathematics and Science			
No. of weeks	14	Hrs. per week	<i>Lecture</i>	<i>Tutorial</i>	<i>Laboratory</i>	<i>Total</i>
			3	1	0	4
Course Description	<p>Statics of particles, equilibrium of rigid bodies, internal forces, trusses; kinematics: rectilinear motion, curvilinear motion; dynamics of particles and rigid bodies, including Newton's second law, friction, impulse, linear momentum, angular momentum, work and energy. 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 151 for further credit.</p>					
Prerequisite(s)	ENGL 099, Physics 12 or PHYS 100 or equivalent; MATH 151 must precede or be taken concurrently.					
Initial Articulation Targets	<i>UBC</i>	<i>SFU</i>	<i>UVic</i>	<i>UNBC</i>	<i>TRU</i>	
	PHYS 170 (3)	PHYS 120 (3)-Q	PHYS 1XX (1.5)	PHYS 1XX (3)	EPHY 1700 (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"> • Solve problems with both SI and FPS system of units. • Construct free body diagrams for particles and rigid bodies. • Determine equations of equilibrium and motion on particles and rigid bodies from external forces including friction and moments. • Predict the motion of an object using the work-energy theorem and the work-energy theorem for rotation and conservation of mechanical energy. • Predict the motion of an object using the impulse-momentum and rotational impulse-momentum theorems and the conservation of momentum and angular momentum. 					
Content	<p>Core topics – all of the following will be covered:</p> <ul style="list-style-type: none"> • General Principles • Force Vectors • Equilibrium of a Particle • Moments • Rigid Body Statics • Friction • Kinematics: Rectilinear, Curvilinear, Relative Motion • Kinetics • Impulse-Momentum Theorem and Conservation of Momentum 					



	<ul style="list-style-type: none"> • Work-Energy Theorem and Conservation of Mechanical Energy • Rigid Body Dynamics including Moment of Inertia <p>Additional topics may also be covered, at the discretion of the instructor:</p> <ul style="list-style-type: none"> • Introduction to special relativity 		
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). Hibbeler, Russell. Engineering Mechanics: Statics and Dynamics. 14th Ed. Pearson, 2016.		
Required Equipment and Technology	Students are required to have a computer with internet access. The following resources are provided by the College: <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	10-40%	
	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), if applicable	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



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Revision History	March 1, 2023-Minor updates (e.g., assessment ranges, textbooks) by Kelly Cheung
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