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CURRICULUM GUIDE: OFFICIAL COURSE OUTLINE

Course Code	PHYS 143	Course Title	Engineering Physics III: Engineering Mechanics			
Credit Value	3	Department	Mathematics and Science			
No. of weeks	14	Hrs. per week	*Lecture*	*Tutorial*	*Laboratory*	*Total*
			3	1	0	4
Course Description	An engineering physics course covering forces, equilibrium of rigid bodies, distributed loads, structural analysis, internal forces, dry friction, kinematics, kinetics, and thermodynamics. This course is calculus-based and intended for students of science and engineering.					
Prerequisite(s)	ENGL 099, PHY 12 or PHYS 100, MATH 151 (MATH may be taken concurrently)					

Initial Articulation Targets	*UBC*	*SFU*	*UVic*	*UNBC*	*TRU*
	PHYS 170 (3)	PHYS 1XX (3)	ENGR 141 (1.5)	PHYS 1XX (3)	EPHYS 1700 (3)
	For updated information on the transferability of this course, please consult the BC Transfer Guide, www.bctransferguide.ca				

Learning Outcomes

Upon successful completion of this course, the student will be able to:

- 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 distributed loads and friction and moments.
- Analyze statically determinant trusses, frames, and machines.
- Analyze statically determinant beams including drawing shear force and bending moment diagrams.
- Solve problems using the first law of thermodynamics, specific heats, and heat of transformation.
- Analyze heat engines using PV diagrams.

Content

Core topics – all of the following will be covered:

Thermodynamics:

- Zeroth Law
- Heat Capacity
- Kinetic Theory
- First Law of Thermodynamics
- Heat Engines

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	Mechanics: • General Principles • Force Vectors • Equilibrium of a Particle • Moments • Rigid Body • Structural Analysis • Internal Forces • Friction • Kinematics • Kinetics Additional topics may also be covered, at the discretion of the instructor.
Methods of Instruction	Lectures, in-class problem solving, assignments, assigned reading, quizzes and examinations.
Required Textbook(s)	The following textbook(s) is/are required, or approved equivalent(s). Hibbeler, Russell. Engineering Mechanics: Statistics and Dynamics. 14th Ed. NJ, USA: Prentice-Hall, 2015. OpenStax College. University Physics. Houston, TX: OpenStax College, 2019.
Required Equipment and Technology	Students are required to have a computer with internet access. The following resources are provided by the College: • Office 365 • Student email
Homework Hours	At minimum, students can expect one hour of homework for every hour of instructional time.

Evaluation	*Component*	*% Value*
	In-class activities	10–15%
	Assignments	10–15%
	Quizzes	10–20%
	Midterm examination	25–35%
	Final examination	25–35%

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)	Kelly Cheung, Ph.D., Head of Mathematics and Science Department, Alexander College	Consultant(s), *if applicable*	Neil Alberding, Ph.D., University of Illinois
Dean's Approval	Steve Roe, Ph.D., Dean of Arts and Sciences, Alexander College	Dean's Approval Date	October 20, 2021
Curriculum Committee Approval Date	October 20, 2021	First Term Offered	

Last Review Date	October 20, 2021	Next Review Date	October 20, 2026
Revision History			

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