Lesson	Learning Outcomes	The digital resources available on EKB		
		Najwa Limited	Longman(pdf)	Discovery
Friction				
Equilibrium of a body on a rough horizontal plane	• Recognize the friction force and final friction force, to find friction coefficient and measurement of friction angle, and to know the relation between them. • Solve problems on the resultant reaction, vertical reaction, and static friction coefficient when the friction is final. • Recognize, determine the conditions of equilibrium on a rough horizontal plane, and to solve problems on it. • Solve real-life applications on equilibrium on a rough horizontal plane.	https://lms.ekb.eg/repository/resource/79918070-f1ba-45d1-8a98-c4827447fa67/en		https://lms.ekb.eg/repository/resource/92f1dc05-3d6d-4719-8b79-844a6a888e6c/en https://lms.ekb.eg/repository/resource/6e0473b8-dcde-4110-b1e7-1708d8ff633f/en
Equilibrium of a body on a rough inclined plane	• Recognize, determine the conditions of equilibrium on a rough inclined plane, and to solve problems on it. • Recognize the relation between the measurement of the friction angle and measurement of the angle of plane inclination plane, and to solve problems on it. • Solve real-life applications on equilibrium on a rough inclined plane.	https://lms.ekb.eg/repository/resource/83eec13f-494c-4db1-96bd-a78ee1d69f22/en		https://lms.ekb.eg/repository/resource/7732d447-df5b-477e-a0f9-a225daaf3f13/en

Lesson	Learning Outcomes	The digital resources available on EKB		
		Najwa Limited	Longman(pdf)	Discovery
Moments				
Moment of a force about a point in a 2-D coordinate system	• Find the moment of force about a point in 2D-coordinate system. • Recognize the Principle of moments (Varignons theorm). • Deduce the algebraic sum of the moments of a system of forces acting at a point about any point in space is equal to the moment of the resultant of these forces about the same point. • Deduce the algebraic sum of the moments of forces about a point is equal to the moment of the resultant about this point.	https://lms.ekb.eg/repository/resource/071ae2d6-5886-470e-bcca-53648776f1c5/en		
Moment of a force about a point in a 3-D coordinate system	• Recognize that there is a moment of force with respect to a point in a three-dimensional coordinate system. • Recognize the components of a force moment with respect to the coordinate axes in a three-dimensional coordinate system, and solve problems on it. • Solve various applications on moments about a point in space.	https://lms.ekb.eg/repository/resource/e6b4344b-8665-419a-a651-8bef79f11bf5/en		

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Parallel coplanar forces				
Resultant of parallel coplanar forces	• Recognize plane parallel forces. • Determine the resultant of two parallel forces in the same direction. • Determine the resultant of two parallel forces in opposite directions. • Determine one of two parallel forces if the other force and the result are known. • Find the moments of a set of parallel forces that are plane around a point. • Find a resultant set of plane parallel forces. • Solve various applications on the resultant planar parallel forces.	https://lms.ekb.eg/repository/resource/1d47a25d-ad64-401e-a9e4-43824e937b66/en		
Equilibrium of a system of parallel coplanar force	• Recognize and apply the equilibrium conditions of several parallel, planar forces in different situations. • Solve various applications on the equilibrium of a body under the influence of a set of parallel, planar forces. • Solve non- Routine problems on the equilibrium of a body under the influence of a set of parallel, planar forces.	https://lms.ekb.eg/repository/resource/4f03b1c7-3590-4ef9-bd00-58097ecdbc8d/en		

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General Equilibrium				
General Equilibrium	• Determine the general conditions of equilibrium of a particle under the act of a set of coplanar forces, and solve application on them. • Determine the magnitude and direction of the reaction force of a (joint – wall – tenon – ground) in various situations. • Solve problems involving the equilibrium of bar or a ladder on a rough horizontal floor and a smooth or a rough vertical wall. • Solve real-life applications on the equilibrium of a bar connected to a joint.	https://lms.ekb.eg/repository/resource/c546dd26-4efc-4751-9220-787115541e24/en		
Couples				
Couples	• Recognize the concept of couple and find couple moment. • Find a coupling moment. • Deduce that the coupling moment is a constant vector. • Recognize the concept of equilibrium of a body under two or more couple's planes, and solve problems on it. • Recognize the equivalence of two couples and the equilibrium of two couples.	https://lms.ekb.eg/repository/resource/08b7ad73-1a56-4916-8807-a16c144700a8/en https://lms.ekb.eg/repository/resource/513a3c31-2a0d-4795-9f16-7e23bc902866/en https://lms.ekb.eg/repository/resource/abf1e2c5-503f-4537-8f85-6494a7d5bde8/en		https://lms.ekb.eg/repository/resource/69731380-1261-4b04-a696-d37f209d9a78/en

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Resultant couple	• Recognize resultant couple and find the algebraic measurement of resultant couple moment. • Solve problems on the resultant of two or more couples. • Solve problems on couple resulting from a force act in one rotational motion, having proportional magnitudes to polygon side lengths. • Solve problems on proving that a set of coplanar forces equals a couple, and to find the algebraic measurement of the couple torque. • Solve various real-life applications on couples.	https://lms.ekb.eg/repository/resource/abf1e2c5-503f-4537-8f85-6494a7d5bde8/en		https://lms.ekb.eg/repository/resource/5a6df4ed-e907-4a8e-aa91-741eb3114ca8/en

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Center of Gravity				
Center of gravity	• Recognize and find the center of pressure for a structure of particles. • Recognize the relationship between body weight, center of gravity, equilibrium, and gravity. • Recognize the center of gravity of a system of particles. • Recognize the position vector of the center of gravity of a rigid body with respect to the origin point. • Deduce the components of the center of gravity in the orthogonal Cartesian coordinate system. • Deduce the center of gravity of a rigid suspended body is inferred in free suspension. • Deduce the center of pressure for two physical points "particles" separated by distance L. • Deduce the center of gravity of a uniform thin rod. • Deduce the center of gravity of a regular thin lamina in the form of a parallelogram. • Deduce the center of gravity of a regular thin lamina in the form of a triangle.	https://lms.ekb.eg/repository/resource/58fd2c6f-66aa-4b40-a25c-8c7950889820/en https://lms.ekb.eg/repository/resource/a952e16e-6289-4ea9-927f-81d0631eca67/en https://lms.ekb.eg/repository/resource/60f05d9a-9d01-4602-a41d-f3ec0141ae7c/en https://lms.ekb.eg/repository/resource/fa06572c-43b6-41a1-a142-6ef404271eea/en		
Negative mass method	• Recognize the method of negative masses to calculate the center of gravity of a body after deleting part of it. • Recognize the center of gravity of some objects that have symmetry properties. • Solve problems on the center of gravity in the field of biomechanics.	https://lms.ekb.eg/repository/resource/58fd2c6f-66aa-4b40-a25c-8c7950889820/en		