

## Course Syllabi

<b>Course Title and Code</b>	<b>PHYSICS 2- PHYS115</b>
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➤ **Course Identification and General Information:**

<b>Department</b>	<b>Deanship of Educational Services</b>	<b>Course Level</b>	Level 2
<b>Contact Hours</b>	1 theory class per week for two hours 1 practical class per week for two hours	<b>Credit Hours</b>	3 (2+2)
<b>Web Address</b>	<a href="http://www.des.qu.edu.sa">http://www.des.qu.edu.sa</a>		

➤ **Course Instructor/Coordinator's Name:** Dr. Haidar Howari

➤ **Textbook Title, Author, and Year:**

- Principles of Physics, Tenth Edition (2014), by Halliday & Resnick. Wiley and Sons, Inc. ISBN 978-1-118-23074-9.

➤ **Other Supplemental Materials:**

- Introduction to Physics, 9th Edition (2013), by John D. Cutnell and Kenneth W. Johnson. Wiley and Sons, Inc. ISBN 978-1-118-09243-9.
- Sears and Zemansky's University Physics with Modern Physics, Thirteenth Edition (2012), by Young Freedman, Pearson. ISBN 13: 978-0-321-76218-4; ISBN 10: 0-321-76218-5.

➤ **Specific Course Information:**

- **Catalog Description:** Principles of Physics, Tenth Edition (2014), by Halliday & Resnick.
- **Pre-requisites:** PHYS110
- **Co-Requisites:** None.
- **Required, Elective, or Selected Elective:** None.

➤ **Specific Goals for the Course:** Summary of the main learning outcomes for enrolled students.

- The aim of this course is to enhance the knowledge of students to understand the surrounding physical phenomena and also to provide students the most important laws in physics.
- This course also prepares and develops student skills at PYP in the area of physics and provides students with the required knowledge in English to qualify them to the scientific colleges.
- To enhance the thinking abilities of students in the area of physics.

➤ **Program Outcomes Addressed by the Course:**

This course provides the following outcomes with the following relationship:

Preparatory Year Program Outcome	Relationship to Course
1. The course contributes to the development of student skills in English writing, reading and conversation.	High
2. The course contributes to the development of student skills in computer and its application in learning process	Low
3. The course helps to develop the skill of the students in the learning process.	High
4. The course strengthens ties education collaborative learning (peer-to-peer and other appropriate sources).	Medium
5. The course fosters the development of student skills in creative thinking, innovative and positive.	Medium
6. The course instills the principles and positive communication within groups (enjoy the team spirit).	Medium
7. The course contributes to the development of student skills in methods of constructive dialogue.	Medium
8. The course fosters the development of student skills in making decisions.	Medium
9. The course helps to develop the skill of the students in problem solving.	high
10. The course helps to develop the skill of students on constructive criticism.	Medium
11. The course helps to develop the skill of students in compliance and accounting.	Low
12. The course helps to develop the skill of students in interaction with the University environment and for undergraduate study.	High
13. The course helps to develop the skill of students in interaction with the environment and the needs and attitudes of the community and science.	High

14. The course helps to develop the skill of students on effective interaction on student activities.	Medium
15. The course helps to develop student skills in the effective interaction in volunteer work.	Medium
16. The course helps to develop student skills in effective leadership.	Medium
17. The course helps to develop student skills in linking information to realistic applications.	High
18. The course helps to develop the skill of students on work ethic.	Medium
19. The course helps to develop student skills in estimating functional responsibility toward national growth.	Medium
20. The course helps to develop student skills in assessing the scientific career path chosen.	high

➤ **Brief List of Topics to be covered:**

- VECTORS
- MOTION IN TWO AND THREE DIMENSIONS
- FORCE AND MOTION—I
- FORCE AND MOTION—II
- KINETIC ENERGY AND WORK
- POTENTIAL ENERGY AND CONSERVATION OF ENERGY
- CENTER OF MASS AND LINEAR MOMENTUM
- ROTATION
- ROLLING, TORQUE, AND ANGULAR MOMENTUM
- EQUILIBRIUM AND ELASTICITY

➤ **Outcome Assessment:**

**1. Direct Assessment**

- Midterm Written Exam I
- Midterm Written Exam II
- Final Written Exam
- Quizzes
- Homework
- Integrative Projects
- Students' Portfolios
- Case Study
- Oral Exams
- Written Reports
- Participation in Lecture
- Illustrative Presentations
- Use of Computer Facilities by Students
- Reading of References Related to Course Topics
- Team Work
- Practice in the Lab

**2. Indirect Assessment**

- Pre-Course Questionnaire
- Post-Course Questionnaire
- Group Discussions
- Students' Interviews

**Course Outline:**

<b>Week</b>	<b>Chapter</b>	<b>Sections</b>	<b>Topics</b>	<b>Pages</b>
1		<b>Revision</b>	<b>Revision</b>	<b>Revision</b>
2	<b>Chapter 3</b> VECTORS	Section 3.1 Section 3.2 Section 3.3 Section 3.4 Section 3.5 Section 3.6 Section 3.7 Section 3.8	What Is Physics? Vectors and Scalars Adding Vectors Geometrically Components of Vectors Unit Vectors Adding Vectors by Components Vectors and the Laws of Physics Multiplying Vectors	From: 38 to 57
3	<b>Chapter 4</b> MOTION IN TWO AND THREE DIMENSIONS	Section 4.1 Section 4.2 Section 4.3 Section 4.4 Section 4.5 Section 4.6 Section 4.7 Section 4.8 Section 4.9	What Is Physics? Position and Displacement Average Velocity and Instantaneous Velocity Average Acceleration and Instantaneous Acceleration Projectile Motion Projectile Motion Analyzed Uniform Circular Motion Relative Motion in One Dimension Relative Motion in Two Dimensions	From: 58 to 86
4	<b>Chapter 5</b> FORCE AND	Section 5.1 Section 5.2	What Is Physics? Newtonian Mechanics	From: 87 to 119

	MOTION—I	Section 5.3 Section 5.4 Section 5.5 Section 5.6 Section 5.7 Section 5.8 Section 5.9	Newton's First Law Force Mass Newton's Second Law Some Particular Forces Newton's Third Law Applying Newton's Laws	
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5	<b>Chapter 6</b> FORCE AND MOTION—II	Section 6.1 Section 6.2 Section 6.3 Section 6.4 Section 6.5	What Is Physics? Friction Properties of Friction The Drag Force and Terminal Speed Uniform Circular Motion	From:116 to 139
6	<b>Chapter 7</b> KINETIC ENERGY AND WORK	Section 7.1 Section 7.2 Section7.3 Section 7.4 Section7.5 Section 7.6 Section 7.7 Section 7.8 Section 7.9	What Is Physics? What Is Energy? Kinetic Energy Work Work and Kinetic Energy Work Done by the Gravitational Force Work Done by a Spring Force Work Done by a General Variable Force Power	From:140 to 165
<b>7</b>	<b>Mid-Term Exam</b>			
8	<b>Chapter 8</b> POTENTIAL ENERGY AND CONSERVATION OF ENERGY	Section 8.1 Section 8.2 Section 8.3 Section 8.4 Section8.5	What Is Physics? Work and Potential Energy Path Independence of Conservative Forces	From:166 to 200

		<p>Section 8.6</p> <p>Section 8.7</p> <p>Section 8.8</p>	<p>Determining Potential Energy Values</p> <p>Conservation of Mechanical Energy</p> <p>Reading a Potential Energy Curve</p> <p>Work Done on a System by an External Force</p> <p>Conservation of Energy</p>	
9	<p><b>Chapter 9</b></p> <p>CENTER OF MASS AND LINEAR MOMENTUM</p>	<p>Section 9.1</p> <p>Section 9.2</p> <p>Section 9.3</p> <p>Section 9.4</p> <p>Section 9.5</p> <p>Section 9.6</p>	<p>What Is Physics?</p> <p>The Center of Mass</p> <p>Newton's Second Law for a System of Particles</p> <p>Linear Momentum</p> <p>The Linear Momentum of a System of Particles</p> <p>Collision and Impulse</p>	<p>From:201 to 214</p>
10	<p><b>Chapter 9</b></p> <p>CENTER OF MASS AND LINEAR MOMENTUM</p>	<p>Section 9.7</p> <p>Section 9.8</p> <p>Section 9.9</p> <p>Section 9.10</p> <p>Section 9.11</p> <p>Section 9.12</p>	<p>Conservation of Linear Momentum</p> <p>Momentum and Kinetic Energy in Collisions</p> <p>Inelastic Collisions in One Dimension</p> <p>Elastic Collisions in One Dimension</p> <p>Collisions in Two Dimensions</p> <p>Systems with Varying Mass: A Rocket</p>	<p>From:215 to 240</p>
11	<p><b>Chapter 10</b></p> <p>ROTATION</p>	<p>Section 10.1</p> <p>Section 10.2</p> <p>Section 10.3</p> <p>Section 10.4</p> <p>Section 10.5</p> <p>Section 10.6</p>	<p>What Is Physics? 241</p> <p>The Rotational Variables</p> <p>Are Angular Quantities Vectors?</p> <p>Rotation with Constant Angular Acceleration</p>	<p>From:241 to 274</p>

		<p>Section 10.7 Section 10.8 Section 10.9 Section 10.10</p>	<p>Relating the Linear and Angular Variables Kinetic Energy of Rotation Calculating the Rotational Inertia Torque Newton's Second Law for Rotation Work and Rotational Kinetic Energy</p>	
12	<p><b>Chapter 11</b> ROLLING, TORQUE, AND ANGULAR MOMENTUM</p>	<p>Section 11.1 Section 11.2 Section 11.3 Section 11.4 Section 11.5 Section 11.6</p>	<p>What Is Physics? Rolling as Translation and Rotation Combined The Kinetic Energy of Rolling The Forces of Rolling The Yo-Yo Torque Revisited</p>	<p>From:275 to 283</p>
13	<p><b>Chapter 11</b> ROLLING, TORQUE, AND ANGULAR MOMENTUM</p>	<p>Section 11.7 Section 11.8 Section 11.9 Section 11.10 Section 11.11 Section 11.12</p>	<p>Angular Momentum Newton's Second Law in Angular Form The Angular Momentum of a System of Particles The Angular Momentum of a Rigid Body Rotating About a Fixed Axis Conservation of Angular Momentum Precession of a Gyroscope</p>	<p>From:284 to 304</p>
14	<p><b>Chapter 12</b></p>	<p>Section 12.1</p>	<p>What Is Physics?</p>	<p>From:305 to</p>



	EQUILIBRIUM AND ELASTICITY	Section 12.2 Section 12.3 Section 12.4 Section 12.5 Section 12.6 Section 12.7	Equilibrium The Requirements of Equilibrium The Center of Gravity Some Examples of Static Equilibrium Indeterminate Structures Elasticity	329
15		<b>Revision</b>	<b>Revision</b>	<b>Revision</b>
16		<b>Final Exam</b>	<b>Final Exam</b>	<b>Final Exam</b>

### Marks distribution for Phys115

- 1) 5 marks for quiz 1
- 2) 5 marks for quiz 2
- 3) 30 marks for Midterm Exam
- 4) 60 marks for Final Exam