

## Comparison between Physics Program in UQU and Physics Program of University of California Santa Barbra program Learning Outcomes

Physics Program Of Umm Al-Qura University Physics	Program of University of California Santa Barbra
<p><b>a1)</b> Recognize the properties of matter</p> <p><b>a2)</b> Discuss the electromagnetism, quantum and classical mechanics, relativity, statistical physics and thermodynamics, wave phenomena and the properties of matter, solid state physics and nuclear physics.</p> <p><b>a3)</b> Employ the fundamental principles to particular areas. These include nuclear and particle physics, condensed matter physics and atomic structure.</p> <p><b>a4)</b> Integrate general and fundamental concepts in physics and related fields.</p> <p><b>a5)</b> Define and formulate fundamental laws in physics.</p>	<ol style="list-style-type: none"> <li><b>1.</b> Apply the basic laws of physics in the areas of classical mechanics, Newtonian gravitation, special relativity, electromagnetism, geometrical and physical optics, quantum mechanics, thermodynamics and statistical mechanics.</li> <li><b>2.</b> Recognize how observation, experiment and theory work together to continue to expand the frontiers of knowledge of the physical universe.</li> <li><b>3.</b> Apply basic mathematical tools commonly used in physics, including elementary probability theory, differential and integral calculus, vector calculus, ordinary differential equations, partial differential equations, and linear algebra.</li> </ol>
<p><b>b1)</b> Apply mathematical and physical formulas and demonstrate skills of critical thinking and analytical reasoning to solve problems in physics and related fields of studies.</p> <p><b>b2)</b> Use the mathematical expressions in evaluating and understanding of essential</p>	<ol style="list-style-type: none"> <li><b>1.</b> Use basic laboratory data analysis techniques, including distinguishing statistical and systematic errors, propagating errors, and representing data graphically.</li> </ol>

<p>facts, concepts, principles and theories of physics</p> <p><b>b3)</b> Gain mental calculating skills by training them on it</p> <p><b>b4)</b> Gain the skills of solving scientific problems related to industrial problems</p> <p><b>b5)</b> Exercise the use skills of solving scientific problems related to industrial problems</p>	<p><b>2.</b> Convert a physical situation articulated in English to a mathematical formulation, and then analyze it quantitatively.</p> <p><b>3.</b> Exercise the use of physical intuition, including the ability to guess an approximate or conceptual answer to a physics problem and recognize whether or not the result of a calculation makes physical sense.</p> <p><b>4.</b> Apply more advanced mathematical tools, including Fourier series and transforms, abstract linear algebra, and functions of a complex variable.</p> <p><b>5.</b> Use classic experimental techniques and modern measurement technology, including analog electronics, computer data acquisition, laboratory test equipment, optics, lasers, and detectors.</p>
<p><b>c1)</b> Show responsibility for self-learning to be aware with recent developments in physics</p>	<p><b>1.</b> Access information on a topic from a variety of sources, and be able to learn new things on one's own.</p>
<p><b>c2)</b> Work effectively in groups and exercise leadership when appropriate</p>	
<p><b>c3)</b> Act as professional and responsible person.</p>	
<p><b>c4)</b> Recognize life-long learning is a necessity as well as a responsibility of every graduate</p>	
<p><b>d1)</b> Communicate effectively in oral and written form</p> <p><b>d2)</b> Collect and classify the material for a course</p> <p><b>d3)</b> Use basic physics terminology in English</p>	<p><b>1.</b> Communicate verbally, graphically, and/or in writing the results of theoretical calculations and laboratory experiments in a clear and concise manner that</p>



<p><b>d4)</b> Acquire the skills to use the internet communicates tools.</p>	<p>incorporates the stylistic conventions used by physicists worldwide.</p> <p><b>2.</b> Access information on a topic from a variety of sources, and be able to learn new things on one's own.</p>
<p><b>e1)</b> Use a perfect experimental tool to solve Physics problems in the Labs</p> <p><b>e2)</b> Employ software skills.</p>	<p>NA</p>