

Course number: OPTO 251	Course title: Optics																																			
Level/semester: e.g. Level 4																																				
Credit hours:	Thereof lecture hours: 2 hours																																			
	Thereof practical hours: 1 hour (1 hour = 2 practical hour)																																			
Language: English																																				
Aims and goals/ skills of the course:	<p>Upon completion of this course, the student should be able to:</p> <ul style="list-style-type: none"> • Name the theories of light and rank wavelengths according to length • Define terminology relating to the behavior of light • Solve optical problems in experimental and clinical settings, regarding the behavior, management, and manipulation of light, and image formation. • Describe the behavior of light when it enters a prism • Understand image formation by plane mirrors, spherical convex mirrors, concave mirrors, their properties of the image and magnification • Define thin and thick lenses, types, power, formula, focal lengths, surface power, and image formation 																																			
Content of the course:	<table border="1"> <thead> <tr> <th>Brief Outlines</th> <th>Week #</th> </tr> </thead> <tbody> <tr> <td>Introduction to light and geometrical optics</td> <td>Week 1</td> </tr> <tr> <td>Rectilinear Propagation of Light: wave fronts, pencils and beams, pinhole camera and shadows</td> <td>Week 2</td> </tr> <tr> <td>Reflection and Mirrors (1): Laws of reflection; Plane mirrors; Spherical mirrors</td> <td>Week 3</td> </tr> <tr> <td>Reflection and Mirrors (2): Images formed by spherical mirrors; Mirror equation + ex.</td> <td>Week 4</td> </tr> <tr> <td>Reflection and Mirrors (3): Spherical Aberration; correction of homework exercises</td> <td>Week 5</td> </tr> <tr> <td>Mid –Term Exam 1</td> <td>Week 6</td> </tr> <tr> <td>Refraction (1): Index of refraction; Laws of refraction; Wavelength and refraction</td> <td>Week 7</td> </tr> <tr> <td>Refraction (2): Total internal reflection; Apparent depth; correction of homework exerc.</td> <td>Week 8</td> </tr> <tr> <td>Lenses and Optical instruments (1): Simple lenses; Lens-makers equation; exercises</td> <td>Week 9</td> </tr> <tr> <td>Lenses and Optical instruments (2): Image Formation by thin lenses; Lens equ.&Magnificatio</td> <td>Week 10</td> </tr> <tr> <td>Lenses and Optical instruments (3): Combination of lenses; Compound microscope; telescopes</td> <td>Week 11</td> </tr> <tr> <td>Mid –Term Exam 2</td> <td>Week 12</td> </tr> <tr> <td>Lenses and Optical instruments (3): Lens Aberrations; correction of homework exercises</td> <td>Week 13</td> </tr> <tr> <td>Prisms: Nomenclature; deviation produced, total internal reflection; etc.; curvature and spherical surfaces, sag formula</td> <td>Week 14</td> </tr> <tr> <td>Thick lenses, thick lens formula, focal lengths, thick lens power, spherocylindrical lenses</td> <td>Week 15</td> </tr> <tr> <td>Final Exam</td> <td>Week 17</td> </tr> </tbody> </table>		Brief Outlines	Week #	Introduction to light and geometrical optics	Week 1	Rectilinear Propagation of Light: wave fronts, pencils and beams, pinhole camera and shadows	Week 2	Reflection and Mirrors (1): Laws of reflection; Plane mirrors; Spherical mirrors	Week 3	Reflection and Mirrors (2): Images formed by spherical mirrors; Mirror equation + ex.	Week 4	Reflection and Mirrors (3): Spherical Aberration; correction of homework exercises	Week 5	Mid –Term Exam 1	Week 6	Refraction (1): Index of refraction; Laws of refraction; Wavelength and refraction	Week 7	Refraction (2): Total internal reflection; Apparent depth; correction of homework exerc.	Week 8	Lenses and Optical instruments (1): Simple lenses; Lens-makers equation; exercises	Week 9	Lenses and Optical instruments (2): Image Formation by thin lenses; Lens equ.&Magnificatio	Week 10	Lenses and Optical instruments (3): Combination of lenses; Compound microscope; telescopes	Week 11	Mid –Term Exam 2	Week 12	Lenses and Optical instruments (3): Lens Aberrations; correction of homework exercises	Week 13	Prisms: Nomenclature; deviation produced, total internal reflection; etc.; curvature and spherical surfaces, sag formula	Week 14	Thick lenses, thick lens formula, focal lengths, thick lens power, spherocylindrical lenses	Week 15	Final Exam	Week 17
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Examination:	<i>e.g. written examination, presentation</i> <i>two midterm exam (40%) + final exam (40%) + practical exam (20%)</i>																																			