

### Syllabus of the Integrated MSc programme in Basics Science -Physics

Course Code	Name of the Course	Nature of the Course	Type of Course	Hours per week	Tutorial	Lab	Credit
<b>Semester I</b>							
IPH2201	Mechanics	Core	T	4	0	0	4
IPH2202	Thermal Physics	Core	T	4	0	0	3
IPH2203	Basic Electronics	Core	T	4	0	0	3
IPH2204	Mathematics- I Trigonometry, Differential Calculus and Matrices	Complementary	T	3	0	0	3
IPH2205	Chemistry- I Basic Theoretical and Analytical Chemistry	Complementary	T	4	0	0	3
IPH2206	Physics Lab-I Mechanics and Thermal Physics	Core	P	0	1	2	2
ICE2201	English Language Skills- I	Common	T	3	0	0	3
<b>Total</b>				22	1	2	21

	Non Credit /Extra Credit courses	Type of Course	Total contact hours	Credit
IPH2207	Latex Programming	Non Credit	36	0
IPH2208	Python Programming-1	Extra Credit	36	1

Semester II							
IPH2209	Relativity, Waves and Optics	Core	T	4	0	0	3
IPH2210	Basic Electrodynamics	Core	T	4	0	0	4
IPH2211	Mathematics- II Integral Calculus and Fourier Series	Complementary	T	3	0	0	3
IPH2212	Chemistry- II Basic Organic Chemistry	Complementary	T	4	0	0	3
IPH2213	Physics Lab – II Waves, Optics, Electricity & Magnetism	Core	P	0	1	2	2
IPH2214	Chemistry Lab- I Volumetric Analysis & Organic Chemistry	Complementary	P	0	1	2	2
ICE2202	English Language Skills- II	Common	T	2	0	0	2
IPH2215	Environmental Science	Common	T	2	0	0	2
<b>Semester Total</b>				19	2	4	21
<b>Cumulative Total</b>				42			

	<b>Non Credit /Extra Credit courses</b>	<b>Type of Course</b>	<b>Total contact hours</b>	<b>Credit</b>
IPH2216	Practice on Arduino Microcontroller	Non Credit	36	0
IPH2217	Python Programming-II	Extra Credit	36	1

Semester III							
IPH2218	Mathematical Physics- I Differential equation -1	Core	T	4	0	0	3
IPH2219	Classical Electrodynamics	Core	T	4	0	0	4
IPH2220	Modern Optics	Core	T	4	0	0	4
IPH2221	Physics Lab-III Computational Physics – I	Core	P	0	1	2	2
IPH2222	Physics Lab-IV Electronics, Modern Optics and Electrodynamics	Core	P	0	1	2	2
IPH2223	Mathematics- III Vector Calculus, Analytic Geometry and Abstract Algebra	Complementary	T	3	0	0	3
IPH2224	Chemistry - III Advanced Physical Chemistry – I	Complementary	T	4	0	0	3
<b>Semester Total</b>				19	2	4	21
<b>Cumulative Total</b>				63			

	<b>Non Credit /Extra Credit courses</b>	<b>Type of Course</b>	<b>Total contact hours</b>	<b>Credit</b>
IPH2225A	Summer project- I	Non Credit	90	0
IPH2226	Yoga Exercises For Sound Health	Non Credit	36	0
IPH2227	Machine Learning Using Python -I	Extra Credit	36	1

<b>Semester IV</b>							
IPH2228	Mathematical Physics- II Differential equation -1I	Core	T	4	0	0	3
IPH2229	Basic Quantum Mechanics	Core	T	5	0	0	4
IPH2230	Physics Lab-V Computational Physics – II	Core	P	0	1	2	2
IPH2231	Physics Lab -VI Mechanics and Basic Quantum Mechanics	Core	P	0	1	2	2
IPH2232	Chemistry - IV Advanced Physical Chemistry – II	Complementary	T	4	0	0	3
IPH2233	Chemistry Lab- II Physical Chemistry	Complementary	P	0	1	2	2
IPH2234	Mathematics- IV Differential Equations, and Complex Analysis	Complementary	T	3	0	0	3
<b>Semester Total</b>				16	3	6	19
<b>Cumulative Total</b>				82			

	<b>Non Credit /Extra Credit courses</b>	<b>Type of Course</b>	<b>Total contact hours</b>	<b>Credit</b>
IPH2235	Health and Emergency Care	Non Credit	36	0
IPH2236	Machine Learning using Python -II	Extra Credit	36	1

<b>Semester V</b>							
IPH2237	Mathematical Physics- III Complex Variables	Core	T	4	0	0	3
IPH2238	Solid State Physics	Core	T	5	0	0	4
IPH2239	Atomic and Molecular Physics	Core	T	4	0	0	4
IPH2240	Physics Lab-VII Computational Physics –III	Core	P	0	1	2	2
IPH2241	Physics Lab-VIII Solid State Physics and Atomic & Molecular Physics	Core	P	0	1	2	2
IPH2242	Research Methodology in Science	Common	T	3	0	0	3
IPH2243	Human Rights	Common	T	3	0	0	2
<b>Semester Total</b>				19	2	4	20
<b>Cumulative Total</b>				102			

	<b>Non Credit /Extra Credit courses</b>	<b>Type of Course</b>	<b>Total contact hours</b>	<b>Credit</b>
IPH2225B	Summer project- II	Non Credit	90	0
IPH2244	Foundation Course in Reasoning	Non Credit	36	0
IPH2245	Machine Learning using Python -III	Extra Credit	36	1

<b>Semester VI</b>							
IPH2246	Mathematical Physics- IV Linear Algebra and Tensors	Core	T	4	0	0	3
IPH2247	Nuclear and Particle Physics	Core	T	4	0	0	3
IPH2248	Classical Mechanics	Core	T	5	0	0	4
IPH2249	Physics Lab- IX Computational Physics – IV	Core	P	0	1	2	2
IPH2250	Physics Lab- X Classical mechanics and Nuclear Physics	Core	P	0	1	2	2
<b>Core Elective</b>							
IPH2251A	Flexible Electronics	Core	T	4	0	0	3
IPH2251B	Nanoscience and Nanotechnology						
IPH2252	Minor project	Core		0	0	2	1
<b>Semester Total</b>				17	2	6	18
<b>Cumulative Total</b>				120			

	<b>Non Credit /Extra Credit courses</b>	<b>Type of Course</b>	<b>Total contact hours</b>	<b>Credit</b>
IPH2253	Plant Propagation	Non Credit	36	0
IPH2254	Machine Learning using Python -IV	Extra Credit	36	1

<b>Semester VII</b>							
IPH2255	Advanced Electronics	Core	T	4	0	0	4
IPH2256	Statistical Mechanics	Core	T	4	0	0	4
IPH2257	Advanced Quantum Mechanics- I	Core	T	5	0	0	4
IPH2258	Condensed Matter Physics	Core	T	4	0	0	4
IPH2259	Physics Lab- XI Advanced Electronics	Core	P	0	0	4	3
IPH2260	Physics Lab- XII Statistical Mechanics	Core	P	0	0	4	3
<b>Semester Total</b>				17	0	8	22
<b>Cumulative Total</b>				142			

	<b>Non Credit /Extra Credit courses</b>	<b>Type of Course</b>	<b>Total contact hours</b>	<b>Credit</b>
IPH2225C	Summer project- III	Non Credit	90	0
IPH2261	Observational Astronomy	Non Credit	36	0

<b>Semester VIII</b>							
IPH2262	Mathematical Physics- V Advanced topics	Core	T	4	0	0	4
IPH2263	Advanced Atomic and Molecular Physics	Core	T	4	0	0	4
IPH2264	Advanced Quantum Mechanics-II	Core	T	5	0	0	4
IPH2265	Astronomy and Astro Physics	Core	T	4	0	0	4
IPH2266	Physics Lab- XIII Condensed Matter Physics	Core	P	0	0	4	3
IPH2267	Physics Lab- XIV Quantum Mechanics	Core	P	0	0	4	3
<b>Semester Total</b>				17	0	8	22
<b>Cumulative Total</b>				164			

	<b>Non Credit /Extra Credit courses</b>	<b>Type of Course</b>	<b>Total contact hours</b>	<b>Credit</b>
IPH2268	Finishing School	Non Credit	36	0



<b>Semester IX</b>							
IPH2269	Quantum Heterostructures	Core Specialization	T	4	0	0	4
IPH2270	Transport in Nanostructures	Core Specialization	T	4	0	0	4
IPH2271	Nano-Optics and Nanophotonics	Core Specialization	T	4	0	0	4
IPH2272	Physics Lab XV- Synthesis and Characterization of Nanomaterials	Core Specialization	P	0	1	2	2
IPH2273	Physics Lab XVI- Nanostructures	Core Specialization	P	0	1	2	2
IPH2274	Lab: Major Project	Core	P	0	0	7	0
<b>Semester Total</b>				12	2	11	16
<b>Cumulative Total</b>				180			

<b>Semester X</b>							
IPH2274	Lab: Major Project	Core	P	0	0	25	16
IPH2275	Viva Voce						4
<b>Semester Total</b>						25	20
<b>Cumulative Total</b>				200			