

CURRICULUM 5-YR INTEGRATED MSc PHYSICS WITH MINOR IN SCIENTIFIC COMPUTING (2018 ONWARDS)

Course Schedule

Course Code	Course Title	L T P	Cr	E S	Course Code	Course Title	L T P	Cr	ES
SEMESTER 1					SEMESTER 2				
18MAT107	Single Variable Calculus	3 1 0	4		18MAT116	Multivariate Calculus	3 1 0	4	
18MAT108	Vectors and Geometry	3 1 0	4		18MAT117	Introduction to Differential Equations	3 1 0	4	
18PHY105	Introduction to Mechanics	3 1 0	4		18PHY115	Electricity and Magnetism	3 1 0	4	
18CHY103	Chemistry I	3 0 0	3		18CHY114	Chemistry II	3 0 0	3	
18CSA102	Introduction to Programming I	3 0 2	4		18CSA112	Introduction to Programming II	3 0 2	4	
18ENG101	Communicative English	2 0 2	3		18ENG121	Professional Communication	1 0 2	2	
18CHY182	Chemistry Lab	0 0 2	1		18PHY184	Physics Lab I	0 0 2	1	
18CUL101	Cultural Education I	2 0 0	2		18CUL111	Cultural Education II	2 0 0	2	
	TOTAL		25			TOTAL		24	
SEMESTER 3					SEMESTER 4				
18PHY206	Intermediate Mechanics I	3 1 0	4		18PHY211	Intermediate Mechanics II	3 1 0	4	
18PHY207	Introduction to Thermal & Modern Physics	3 1 0	4		18PHY212	Thermal and Materials Physics	3 1 0	4	
18MAT220	Introduction to Linear Algebra	3 1 0	4		18PHY213	Atomic, Molecular and Nuclear Physics	3 1 0	4	
18MAT210	Transforms and PDE	3 1 0	4		18PHY219	Waves and Optics	3 1 0	4	
18ENV300	Environmental Science and Sustainability	3 0 0	3		18MAT225	Numerical Methods	3 1 0	4	
	Language I	1 0 2	2			Language II	1 0 2	2	
18PHY281	Physics Lab II	0 0 3	1		18PHY282	Physics Lab III	0 0 3	1	
18AVP201	Amrita Value Programme I	1 0 0	1		18AVP211	Amrita Value Programme II	1 0 0	1	
	TOTAL		23			TOTAL		24	
SEMESTER 5					SEMESTER 6				
18PHY301	Classical Mechanics	4 1 0	4		18PHY311	Mathematical Physics II	3 1 0	4	
18PHY302	Mathematical Physics I	3 1 0	4		18PHY312	Electrodynamics II	3 1 0	4	
18PHY303	Electrodynamics I	3 1 0	4		18PHY313	Statistical Mechanics	3 1 0	4	
18PHY304	Electronics I	3 1 0	4		18PHY314	Quantum Mechanics I	3 1 0	4	
18PHY390	Open Elective/Live in Lab® (2nd Summer)	3 0 0	3		18PHY315	Electronics II	3 1 0	4	
18PHY386	Physics Lab IV	0 0 3	1		18PHY383	Physics Lab VI (Electronics II)	0 0 3	1	
18PHY387	Physics Lab V (Electronics I)	0 0 3	1		18SSK211	Life Skills II	1 0 2	2	
18SSK201	Life Skills I	1 0 2	2						
	TOTAL		23			TOTAL		23	
					TOTAL (for Exit-option students)		142		
SEMESTER 7					SEMESTER 8				
18PHY507	Quantum Mechanics II	3 1 0	4		18PHY516	Condensed Matter Physics II	3 1 0	4	
18PHY505	Condensed Matter Physics I	3 1 0	4		18PHY517	Atomic and Molecular Spectroscopy	3 1 0	4	
18PHY506	Computational Physics I (Minor Course I)	3 1 0	4			Minor Course III	3 1 0	3/4	
	Minor Course II	3 0 1	4			Physics Elective II	3 0 0	3	
	Physics Elective I	3 0 0	3		18PHY590	Research Methodology and Seminar	1 0 1	2	
18PHY584	Physics Lab VII	0 0 6	2		18PHY585	Physics Lab VIII	0 0 6	2	
18SSK301	Life Skills III	1 0 2	2						
	TOTAL		23			TOTAL	18/19		
SEMESTER 9					SEMESTER 10				
18PHY603	Nuclear and Particle Physics	3 1 0	4		18PHY699	Thesis		15	
	Physics Elective III	3 0 0	3						
18PHY691	Mini project and Seminar		6			TOTAL		15	
	TOTAL		13			TOTAL CREDITS = 211/212			

Live in Lab®: This initiative is to provide opportunities for students to get involved in coming up with solutions for societal problems.

Language Electives

Code	Paper I				Paper II		
18HIN101	Hindi I	1 0 2	2		18HIN111	Hindi II	1 0 2 2
18KAN101	Kannada I	1 0 2	2		18KAN111	Kannada II	1 0 2 2
18MAL101	Malayalam I	1 0 2	2		18MAL111	Malayalam II	1 0 2 2
18SAN101	Sanskrit I	1 0 2	2		18SAN111	Sanskrit II	1 0 2 2

Physics Electives (3 Credits)

Code	PHYSICS ELECTIVES	L T P	Cr	Code	MINOR COURSE II & III	L T P	Cr
18PHY336	Space Physics	3 0 0	3	18CSA209	Data Structures and Algorithms	3 1 0	4
18PHY342	Nonlinear Optics	3 0 0	3	18CSA308	Machine Learning I	3 1 0	4
18PHY531	Introduction to Quantum Computing (Physics)	3 0 0	3	18CSA316	Machine Learning II	3 1 0	4
18PHY532	Advanced Statistical Mechanics	3 0 0	3	18MAT541	Probability and Statistics with R	3 1 0	4
18PHY534	Epistemological Foundations of Quantum Mechanics	3 0 0	3	18MAT542	Optimization Methods	3 1 0	4
18PHY535	Topics in Astrophysics	3 0 0	3	18PHY551	Computational Physics II	3 0 0	3
18PHY536	Plasma Physics	3 0 0	3	18PHY552	Computational Condensed Matter Physics	3 0 0	3
18PHY537	Fluid Dynamics	3 0 0	3	18PHY553	Nonlinear Dynamics	3 0 0	3
18PHY538	Solid State Electronic Devices	3 0 0	3				
18PHY539	Optoelectronics	3 0 0	3		OPEN ELECTIVES (PHYSICS)		
18PHY540	Physics at Nanoscale	3 0 0	3	18OEL297	History and Philosophy of Science	3 0 0	3
18PHY541	Mesoscopic Physics and Quantum Conductors	3 0 0	3	18OEL298	EU History of Science and Technology	4 0 0	3
18PHY542	Thin Film Physics	3 0 0	3				
18PHY543	Methods of Experimental Physics	3 0 0	3				
18PHY320	Modern Optics	3 0 0	3				
18PHY545	Fourier Optics	3 0 0	3				
18PHY546	Lasers and Applications	3 0 0	3				
18PHY547	Physics of the Atmosphere	3 0 0	3				
18PHY633	Biophotonics	3 0 0	3				
18PHY636	Fibre Optic Sensors and Applications	3 0 0	3				
18PHY637	Fibre Optics and Technology	3 0 0	3				
18PHY638	Nanophotonics	3 0 0	3				

Open Electives (3-0-0-3) (3 Credits)

Code	Course Title	Code	Course Title
18OEL231	Advertising		
18OEL232	Basic Statistics	18OEL263	Negotiation and Counselling
18OEL233	Citizen Journalism	18OEL264	New Literatures
18OEL234	Creative Writing for Beginners	18OEL265	Non-Profit Organization
18OEL235	Desktop Support and Services	18OEL266	Personal Effectiveness
18OEL236	Development Journalism	18OEL267	Perspectives in Astrophysics and Cosmology
18OEL237	Digital Photography	18OEL268	Principles of Marketing
18OEL238	Emotional Intelligence	18OEL269	Principles of Public Relations
18OEL239	Essence of Spiritual Literature	18OEL270	Science, Society and Culture
18OEL240	Film Theory	18OEL271	Statistical Analysis
18OEL241	Fundamentals of Network Administration	18OEL272	Teamwork and Collaboration
18OEL242	Gender Studies	18OEL273	The Message of Bhagwad Gita
18OEL243	Glimpses of Indian Economy and Polity	18OEL274	Understanding Travel and Tourism
18OEL244	Graphics and Web-designing Tools	18OEL275	Videography
18OEL245	Green Marketing	18OEL276	Vistas of English Literature
18OEL246	Healthcare and Technology	18OEL277	Web-Designing Techniques
18OEL247	History of English Literature	18OEL278	Organic Farming
18OEL248	Indian Writing in English	18OEL279	Basic Legal Awareness on Protection of Women and
18OEL249	Industrial Relations and Labour Welfare	18OEL280	Ritual Performances of Kerala
18OEL250	Introduction to Ancient Indian Yogic and Vedic	18OEL281	Documenting Social Issues
18OEL251	Introduction to Computer Hardware	18OEL282	Fabrication of Advanced Solar Cell
18OEL252	Introduction to Event Management	18OEL283	Basic Concepts of X-ray Diffraction
18OEL253	Introduction to Media	18OEL284	Introduction to FORTRAN and GNUPLLOT
18OEL254	Introduction to Right to Information Act	18OEL285	Introduction to Porous Materials

18OEL255	Introduction to Translation	18OEL286	Forensic Science
18OEL256	Linguistic Abilities	18OEL287	Introduction to solar Physics
18OEL257	Literary Criticism and Theory	18OEL288	Recycling Recovery and Treatment Methods for Wastes
18OEL258	Macro Economics	18OEL289	Acting and Dramatic Presentation
18OEL259	Managing Failure	18OEL290	Computerized Accounting
18OEL260	Media Management	18OEL291	Kerala Mural Art and Painting
18OEL261	Micro Economics	18OEL292	Painting
18OEL262	Micro Finance, Small Group Management and	18OEL293	Reporting Rural Issues