

COs Third Semester Courses MSc Physics

Semester	III
Course Code and Course Name	MSPH201: Atomic and Molecular Physics
Course Outcomes	
CO1	Gain knowledge of fundamentals of atomic physics and its application to the complex system.
CO2	Implement the external perturbation concerning electric and magnetic fields to materials of optoelectronic interest.
CO3	Deal with various advanced molecular spectroscopic techniques used to characterize optoelectronic materials.
CO4	Predict the behavior of ground and excited electronic states of materials used for light-emitting devices and other sensors.
CO5	Work professionally in the area of vibrational, rotational, and electronic spectroscopy of molecular systems responsible for modern-age advanced materials.

Semester	III
Course code and Course Name	MSPH 203: Nuclear and Particle Physics
Course Outcomes	
CO1	To Understand static (basic) information about the nucleus and its properties
CO2	To Interpret the available information and identify missing and contradictory information from nuclear and particle experimental results
CO3	To analyze the nuclear models by assimilations of experimental observations and propose new models
CO4	To solve problems by applying concepts, laws, theories of nuclear and particle physics in new situations
CO5	To understand recent practical application of nucleus and sub nuclear particles

Semester	III
Course code and Course Name	MSPH-207: Fibre and Integrated optics
Course Outcomes	
CO1	To understand and analyse the light guidance in planar waveguides
CO2	To analyse essentials of an optical fibre communication system and the factors leading to signal degradation in optical fibres leading to the design of low loss optical fibres
CO3	To engineer the design parameters of low loss fibres in the optical communication window.
CO4	To identify and evaluate the performance of various components of an optical fibre communication system.

CO5	To use the gained knowledge of this course to design the minor-research project related activities
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Semester	III
Course code and Course Name	MSPH-215: Plasma Physics
Course Outcomes	
CO1	Identify the various type of plasma production and diagnostic techniques. Analyze the motion of charged particles in electric and magnetic fields, determine the various type of drift velocities of charged particles moving in electric and magnetic fields that are either uniform or vary slowly in space and time.
CO2	Derive the expressions for Langmuir waves, Ion acoustic waves and Electromagnetic waves in unmagnetized plasma. Also derive the dispersion relation for upper hybrid waves, lower hybrid waves, ion-cyclotron waves in magnetized plasmas.
CO3	Derive the expressions for D.C. and A.C. conductivities in presence of magnetic fields. Also explain in details about Rayleigh Taylor Instability and Weibel Instability of counter streaming electron beams, Kelvin Helmholtz Instability, Two stream Instability(linear), KDV equation etc.
CO4	Derive the expressions for Vlasov equation using kinetic treatment, differentiate between fluid model and kinetic model, Explain Landau damping and solution of Vlasov equation.
CO5	Role of plasma in the nucleation and growth of nanoparticles, dust particles, CNTs, Graphene & g-CNT hybrids. Also, role of plasma on CNTFETs and g-FETs. Effects of Plasma on FELs, CFELs and Introduction to ITER and Tokamak confinement

Semester	III
Course code and Course Name	MSPH-217: Characterization Techniques
Course Outcomes	
CO1	Create theoretical and analytical skills among students for various structural characterizations technique of materials
CO2	Enable students to understand various primary characterization techniques for scientific, engineering and technological aspect of materials
CO3	To impart the knowledge of micro to nano level structural and spectroscopic characterizations of materials
CO4	Equip the students with knowledge, principle and design of microscopic techniques and their analysis
CO5	To impart the knowledge, principle of thermal characterization techniques and their analysis for industrial and social applications

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Semester	IV
Course Code and Course Name	MSPH 202: Advanced Semiconductor Devices
Course Outcomes	
CO1	Ability to understand physics of microwaves, semiconductor.
CO2	Understanding of Fundamental of photonic devices.
CO3	Understanding and application of memory devices.
CO4	Highlight applications of microwave, photonic and memory devices.
CO5	Utilization of knowledge of physics and fabrication in device application.

Semester	IV
Course Code and Course Name	MSPH 204: Space and Atmospheric Science
Course Outcomes	
CO1	Explanation ability about various radiation laws and their physical significance.
CO2	Understanding the structure and properties of different atmospheric layers around earth.
CO3	Deep idea of meteorological instruments and their measuring parameters.
CO4	Realize various techniques for measuring gaseous pollutants and their impact on human health and climate change.
CO5	Analyse the radar principles and wind profiler applications.

Semester	IV
Course Code and Course Name	MSPH-216: Advanced Functional Materials
Course Outcomes	
CO1	Ability to understand crystal, bonding structure of materials
CO2	Knowledge of synthesis and techniques of material
CO3	Understanding and application characterization techniques
CO4	Potential application of functional materials
CO5	Importance of nanomaterial for society, health and environment