



UNIVERSITY OF ENGINEERING & MANAGEMENT
Good Education, Good Jobs

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

(Approved by AICTE and recognized by UGC, Ministry of HRD, Govt. of INDIA)

'Gurukul', 6 Kms. from Chomu on Sikar Road, Udaipuria Mod, Chomu, Jaipur-303807 (Rajasthan)

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Minutes of Meeting of Board of Studies for Department of Physics University of Engineering & Management, Jaipur held on 09.07.2024

The Meeting of Board of Studies for Department of Physics was held on 9th July, 2024 at 11.00 AM.
The following members were present-

1. Prof. (Dr.) Pradeep Kumar Sharma, Provost, Professor and Head, Department of Physics, UEM Jaipur.
2. Dr. Arnab Palui, Associate Professor, Department of Physics, UEM Jaipur
3. External Subject Expert – Prof.(Dr.) K. C. Jain, Rtd. Senior Professor, MNIT Jaipur.

Prof. (Dr.) Pradeep Kumar Sharma, Professor, Department of Physics, UEM Jaipur welcomed all the members of Board of Studies before commencement of the meeting. Thereafter agenda points of the meeting of Board of Studies were taken up for discussion.

The Board of Studies of Department of Physics, UEM Jaipur took the following resolutions:

Agenda Item No-1:

Confirmation of minutes of last BOS Meeting held on 14.12.2023.

The minutes of the last meeting of Board of studies was circulated to all the members in advance through mail. As there was no observation raised in the meeting, it was confirmed.

Agenda Item No-2:

To read the Action Taken Report of last Board of Studies meeting held on 14.12.2023.

The agenda wise Action Taken Report of the last meeting of Board of Studies for Department of Physics was circulated to all the members in advance through mail. As there was no observation raised, it was confirmed.

Agenda Item No-3

To report on the syllabus for Physics in B.Tech. 1st year (1st and 2nd semesters)

Prof. (Dr.) Pradeep Kumar Sharma informed that UEM Jaipur has implemented AICTE model curriculum for Physics for UG courses of Engineering for academic sessions 2018-19 to 2024-25 and topics related to updates of emerging technologies and courses.

Syllabus for the above are attached herewith for consideration.

As there was no observation raised, it was confirmed.

Agenda Item No-4

Any other matter with the permission of the Chair.

The meeting ended with vote of thanks to the Chair.

Dr. Arnab Palui
9-7-24



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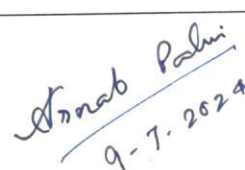
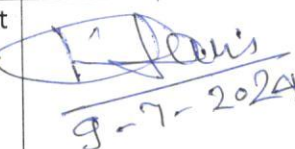
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Attendance Sheet for Meeting of Board of Studies

Department of Physics

University of Engineering & Management, Jaipur

09.07.2024

S.no.	Name	Designation	Signature
1	Prof.(Dr.) Pradeep Kumar Sharma	Registrar and Provost, Professor & Head, Department of Physics, UEM Jaipur (Chairman)	
2.	Dr. Arnab Palui	Associate Professor, Department of Physics, UEM Jaipur, Member	 9-7-2024
3.	Prof.(Dr.) K. C. Jain, Rtd Senior Professor, MNIT Jaipur	External Subject Expert, MNIT Jaipur	 9-7-2024



University of Engineering and Management
Institute of Engineering & Management, Salt Lake Campus
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur



Syllabus for B.Tech. Admission Batch 2024

Subject Name: Physics

Credit: 4

Lecture Hours: 42

Subject Code : BSCPH101 / BSCPH201

Pre-requisite: Physics of Higher Secondary Standard

Relevant Links:

Study Material

Coursera

NPTEL

IEM Learning

COURSE OBJECTIVES :

1. To train the students to grasp the concepts of different areas of physics, appropriate for applications in different branches of engineering.
2. To expand their knowledge of Physics, which will be suitable for different engineering streams.
3. Learn to apply the different theories of physics in real life problems.
4. Try to think new problems of physics for applications in engineering.

Dr. Ravi Singh
9-1-2024

COURSE OUTCOMES:

CO1: Develop an understanding of the fundamental theories of physics such as optics, electromagnetic theory, classical mechanics, quantum mechanics and statistical mechanics for engineering applications in societal and environmental contexts.

CO2: Study the wave nature of light by means of phenomena like interference, diffraction and LASER and to study the Maxwell's equations to understand the concepts of electromagnetic theory.

CO 3: Using the concepts of classical mechanics to study the motion of particles and systems, learning the postulates of quantum mechanics to analyze the behavior of particles in quantum levels and understanding the behavior of physical systems by statistical methods.

CO4: Develop an ability to analyze and solve theoretical problems of physics.

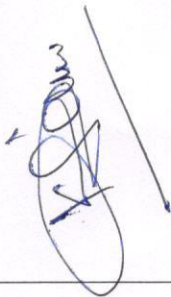
Module number	Topic	Sub-topics	Books to be referred	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	Mechanics	Part A: Vector Calculus Representation of a vector, Some Important Definitions about Vectors, Resolution of a Vector into Components, Product of Two Vectors, Triple Product, Scalar and Vector Fields, Partial Derivative of Vectors, Gradient of Scalar Field, Divergence of Vector Field, Curl of a Vector Field, Curl in the Context of Rotational Motion Part B: Classical Mechanics Inertial and Non-Inertial Frame of references, Friction, Problems including constraints and Friction, conservation Laws, Rigid Body, Angular Velocity Vector, Moment of Inertia, Acceleration of a Rigid Body Rolling Down an Inclined plane	<i>Engineering Physics</i>, Sujay Kumar Bhattacharya, Mc Graw Hill Education, Chapter 1	International Academia: https://catalog.mit.edu/subjects/8/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_ECE.pdf Industry Mapping: Matlab software	8	To determine the Rigidity modulus of the Material of a wire by Dynamic Method To determine the Rigidity modulus of the Material of a wire by Static Method To determine the Acceleration due to Gravity using Bar Pendulum

2	Oscillations	Oscillations: Introduction, Relation of Simple Harmonic Motion with Circular Motion, Differential Equation of Simple Harmonic Motion, Various Characteristics of SHM, Energy of a Particle Executing SHM and Law of Conservation of Energy, Differential Equation of Free or Undamped Vibrations, Damped vibrations, Solution of the Equation of a Damped Oscillator and its Analysis, Electrical Analogy of SHM and DV, Analysis of Forced Vibration, Resonance, Energy of a Forced Vibrator, Sharpness of Resonance, Quality Factor, Forced Vibration in an LCR Circuit	Engineering Physics, Sujay Kumar Bhattacharya, McGraw Hill Education, Chapter 2.	International Academia: https://catalog.mit.edu/subjects/8/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_ECE.pdf Industry Mapping: <i>Matlab software</i>	5	To generate parametric oscillations in a string using Melde's experimental set-up.
3	Optics	Interference : Interference of light, Young's experiment, Resultant intensity due to superposition of two interfering waves, Interference and conservation of energy, Determination of fringe width in Young's experiment, Shape of interference fringes, conditions for interference of light, coherent sources, production of coherent sources, Fresnel's biprism, displacement of fringes, phase change on reflection, interference due to thin films, interference due to wedge shaped thin films, formation of Newton's ring. Diffraction: Different types of diffraction phenomena, difference between	Physics, B.K.Pandey, Monoj K Harbola et. al., Cengage, Chapter 2.	International Academia: https://catalog.mit.edu/subjects/8/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_ECE.pdf Industry Mapping: <i>Matlab software</i>	10	To determine the radius of curvature of a Plano convex lens by formation of Newton's ring method. To determine the wavelengths of a given light source by diffraction grating method.

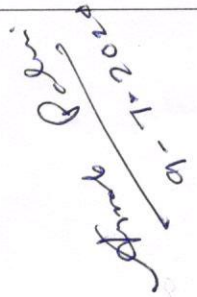
		interference and diffraction, Fraunhofer diffraction due to a single slit, Fraunhofer diffraction due to a double slit, difference between single slit and a double slit diffraction pattern, diffraction due to plane diffraction grating, Rayleigh's criteria on resolution, resolving power of a grating, application of diffraction grating.	Engineering Physics, Sujay Kumar Bhattacharya, Mc Graw Hill Education, Chapter 3. Engineering Physics, Sujay Kumar Bhattacharya, Mc Graw Hill Education, Chapter 5.			
		Laser: Characteristics of laser, Absorption and emission of radiations by matter, working principle of laser, population inversion in laser, basic components of laser system, optical resonator and Q value, threshold condition for sustaining of laser action, typical lasers, application of lasers.				


 Date: 1-7-2024
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4	Introduction to Electromagnetic Theory	Maxwell's equations: Magnetic flux, Faraday's law of induction, electromotive force, Integral form of Faraday's law, displacement current, Ampere's Circuital law, Modified Ampere's law, Continuity property of current, Maxwell's Equations	Engineering Physics , Sujay Kumar Bhattacharya, Mc Graw Hill Education, Chapter 7.	International Standards : AICTE prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_ECE.pdf	6	Determination of electron charge to mass ratio (e/m) Determination of Hall coefficient. Conversion of vibration to voltage using piezoelectric materials
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6-1-2022
 Ravi

5	Quantum Mechanics	Quantum Mechanics : Introduction, Wave function and its physical Significance, Normalization of wave functions and Orthogonality of wave functions, Operators in Quantum Mechanics, Fundamental postulates of Quantum mechanics, Time-dependent Schrodinger's equation, Time-independent Schrodinger's wave equation, Application of Schrodinger's equation, Quantum harmonic oscillator, The Hydrogen atom	Engineering Physics, Sujay Kumar Bhattacharya, Mc Graw Hill Education, Chapter 10.	International Standards: https://catalog.mit.edu/subjects/8/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_ECE.pdf	7	Determination of Planck's constant by photoelectric emission process Determination the excitation potential of a given gas by Franck-Hertz experiment Determination of Planck's Constant using LED Determination of the band-gap of a semiconductor by measuring the resistivity at different Temperatures by four-probe method To study the different characteristics of a solar cell
6	Statistical Mechanics	Statistical Mechanics : Introduction, Concept of Phase Space, Concept of Energy levels and Energy states, Macrostate and Microstate, Thermodynamic Probability and Entropy, Equilibrium Macrostate, MB, BE and FD statistics, Maxwell-Boltzmann (MB) Statistics, Bose-Einstein (BE) Statistics, Fermi-Dirac (FD) Statistics, Classical Statistics as a special case of Quantum Statistics, Density of states or Quantum states in energy range between ϵ and $\epsilon + d\epsilon$, Fermi distribution at zero and non-zero temperature, Derivation of plank's law of Radiation from BE Statistics, Comparative study of three Statistical Distribution functions	Engineering Physics, Sujay Kumar Bhattacharya, Mc Graw Hill Education, Chapter 11.	International Standards: https://catalog.mit.edu/subjects/8/ AICTE-prescribed syllabus: https://www.aicte-india.org/sites/default/files/Model_Curriculum/Final_ECE.pdf	6	 

TEXT BOOK:

1. Engineering Physics by Sujay Kumar Bhattacharya, McGraw Hill Education

REFERENCE BOOKS:

1. Theory and problems of Theoretical Mechanics by Murray R. Spiegel SI (Metric) edition
2. Advanced Acoustics by Dr.D.P.Raychaudhuri, The new book stall, Revised Ninth Edition, 2009
3. A textbook on Optics, B.Ghosh and K.G.Majumder, Sreedhar Publishers, fifth edition
4. Introduction to Electrodynamics by David J.Griffiths 3rd Edition
5. Concepts of Modern Physics (Sixth Edition) by Arthur Beiser (Published by McGraw-Hill)



0-7-2024
Rajini