

परीक्षा नियंत्रण प्रकोष्ठ, जबलपुर इंजीनियरिंग महाविद्यालय, जबलपुर (म.प्र.)

क्रमांक/प.नि.प्र./2024/2682

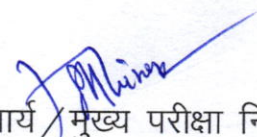
जबलपुर, दिनांक 18/10/2024

सूचना

महाविद्यालय में अध्ययनरत B.Tech. (AICTE) / B.Tech. (PTDC) [AICTE] [Regular/Ex.] विद्यार्थियों को सूचित किया जाता है कि वे नवम्बर 2024 की परीक्षा एवं आगामी सत्र की परीक्षाओं में सम्मिलित होने से पूर्व अपने पेपर/विषय का Equivalence Syllabus महाविद्यालय के पोर्टल से Download कर प्राप्त कर सकते हैं अथवा महाविद्यालय के परीक्षा नियंत्रण प्रकोष्ठ में संपर्क कर सकते हैं। नवम्बर 2024 परीक्षा एवं आगामी सत्र की परीक्षा में उन्हें अपने पेपर/विषय में Equivalence Syllabus में ही सम्मिलित होना है। अतः Equivalence Syllabus की जानकारी न होने की दशा में सम्पूर्ण जिम्मेदारी स्वयं छात्र/छात्राओं की होगी।

Equivalence Syllabus हेतु निम्नानुसार Link का उपयोग कर सकते हैं:-

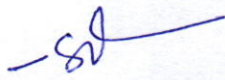
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प्राचार्य/मुख्य परीक्षा नियंत्रक
जबलपुर इंजीनियरिंग महाविद्यालय
जबलपुर

पृ.क्रमांक/प.नि.प्र./2024/
प्रतिलिपि:-

जबलपुर, दिनांक /10/2024


01. समस्त विभागाध्यक्ष, जबलपुर इंजीनियरिंग महाविद्यालय, जबलपुर।
02. पीटीडीसी कार्यालय, जबलपुर इंजीनियरिंग महाविद्यालय, जबलपुर।



प्राचार्य/मुख्य परीक्षा नियंत्रक
जबलपुर इंजीनियरिंग महाविद्यालय
जबलपुर

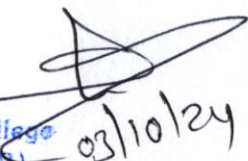
**EQUIVALENCE OF SUBJECTS OF DIFFERENT SCHEMES OF UNDER GRADUATE COURSES (B.Tech.)
OF Applied Physics**

S.No.	Schemes	Subject Code & Subject Name (Semester) Having Equivalence in Syllabus	Final Subject code & subject (after equivalence)
1	AICTE	BT201 Engineering Physics B.Tech. I / II Sem.	BT21 Engineering Physics B.Tech. I / II Sem.
	Scheme 2023	BT21 Engineering Physics B.Tech. I / II Sem.	


Controller (Exam.)
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)


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03/10/24

Jabalpur Engineering College, Jabalpur

(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)

(AICTE Model Curriculum Based Scheme)

Bachelor of Technology (B.Tech.) I / II Semester (All Branches)

COURSE CONTENTS

w.e.f. July 2024

SUBJECT CODE	CATEGORY CODE	SUBJECT NAME	MAXIMUM MARKS ALLOTTED						HOURS/ WEEK			CREDITS
			THEORY			PRACTICAL			L	T	P	
			END. SEM	MID. SEM	QUIZ/ ASSIGNMENT	END SEM	LAB WORK					
BT 21	BSC	ENGINEERING PHYSICS	70	20	10	30	20		3	-	2	4

DETAILED SYLLABUS

MODULE I:

Electrodynamics & Semiconductors: Gradient, Divergence and Curl, Gauss Divergence Theorem, Stokes theorem. Introduction to Dielectrics, Electric Polarization P, Displacement vector D, Relation between D, E and P.

Semiconductors: Free electron theory of metals, Fermi level of Intrinsic and extrinsic semiconductors, density of states, Bloch's theorem for particles in a periodic potential, Kronig- Penney model (no derivation) and origin of energy bands, V-I characteristics of PN Junction, Zener diode, solar cell, Hall effect.

MODULE II:

Quantum Mechanics: Basic Ideas of quantum mechanics. de Broglie's hypothesis. Davisson and Germer experiment. Group & Phase velocity, Heisenberg's Uncertainty principle, Compton Effect: Wave function (ψ) and its physical significance. Schrödinger Time Dependent & Time Independent wave equation. Application of Schrödinger wave equation: Particle in one dimension box.

MODULE III:

Optics: Interference on the basis of Division of wavefront (Fresnel Biprism) and Division of amplitude (Interference in Thin films & Newton's Rings). Michelson Interferometer. Diffraction of light, Diffraction at Single-Slit. Plane Transmission grating (PTG). Concept of Polarized light, Brewster's law, Nicol Prism.

MODULE IV:

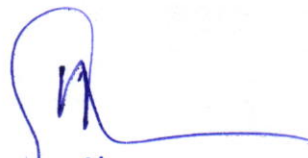
Nuclear Physics: Static properties of Nucleus. Liquid Drop Model and Semi-empirical mass formula. Particle Accelerators: Linear Accelerator (LINAC), Cyclotron, Betatron. Geiger Muller counter and Bainbridge mass spectrograph.

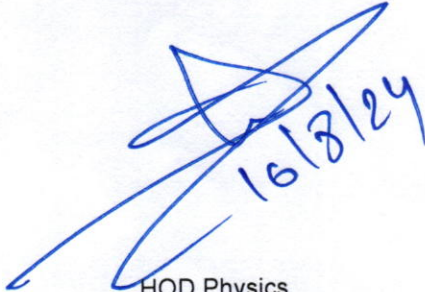
Nano Technology: Elementary ideas about Nano science & Nano Technology and its applications in science and engineering.

MODULE V:

Laser: Einstein's coefficients, Principle and properties of Laser. Construction, working, energy level diagram and applications of Ruby Laser, He-Ne Laser, CO₂ and Semiconductor Laser. Laser Speckle phenomenon.

Fiber Optics: Fundamental ideas and applications of optical fiber, Types of Optical Fiber on the basis of mode, material and refractive index. Propagation of signal into optical fiber, Numerical aperture & V-number of an optical fiber, Dispersion in optical fibers. Losses in optical fibers.


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16/8/24
HOD Physics



REFERENCE BOOKS:

1. *Concepts of Modern Physics* by Arthur Beiser
2. *Fundamentals of Physics* by Resnick, Halliday & Walker
3. *A Text Book of Engineering Physics* by Navneet Gupta. & S.K.Tiwary
4. *Introduction to Astrophysics* by Baidyanath Basu (PHI)
5. *Introduction to Nanoscience and Nanotechnology* by K.K.K Chattopadhyay & A.N. Banerjee (PHI)
6. *Engineering Physics* by R K Gaur & S L Gupta (Dhanpat Rai Publication).

LIST OF EXPERIMENTS:

1. To determine refractive index (μ) of the material of given prism.
2. To determine the dispersive power (ω) of a prism.
3. To determine the grating element (e) of a plane transmission grating (PTG).
4. To determine the wavelength of green light using PTG and spectrometer.
5. To determine the wavelength of red light using diode laser through PTG.
6. To determine radius of curvature of a Plano convex lens using Newton's ring method.
7. To draw graph between RI and wavelength for light of different wavelengths using Hg vapor lamp and spectrometer and verify the Cauchy's formula.
8. To determine the resolving power of a PTG.
9. To determine the energy band gap (E_g) of a semiconductor using a junction diode.
10. To determine the resolving power of telescope.
11. To plot the V-I characteristics of P-N junction diode.
12. To plot the V-I characteristics of Zener diode.
13. To plot the V-I characteristics of NPN transistor.
14. To plot the V-I characteristics of LED.
15. To study of preparation of nano materials.
- 16.

Course Outcomes (CO):

At the end of the course, the student will be able to:

1. Solve the problems of electrodynamics & semiconductors used in various related applications.
2. Apply principles of quantum mechanics at microscopic level.
3. Analyze principles of optics towards the optical applications.
4. Apply concept of nanotechnology in various fields and the problems related to nuclear physics.
5. Analyze features of laser system and optical communication system.


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**Mapping of Course Outcomes (COs) with Program Outcomes (POs)
Engineering Physics (BT 21)**

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	02	01	01	-	01	01	01	-
CO2	01	02	01	01	-	-	-	-
CO3	02	01	-	-	-	-	-	-
CO4	02	01	1	-	-	-	01	-
CO5	01	-	-	-	-	-	01	-


The **above-mentioned** scheme and syllabus is approved here with:

Programme Educational Objectives (PEOs) of the Engineering Physics

1. To identify, formulate, create, analyze, design, develop and optimize various problems related to various fields of physics through basic knowledge.
2. To the industry by applying the skills and knowledge acquired during the course period.
3. To be prepared for the successful pursuit of graduate studies and shall have abilities to engage in lifelong learning in various field and will understand the challenges of a dynamically and globalised changing world adapting their skills through continuous learning and self improvement.
4. To demonstrate the ability of gauging the impact of science on society, and possess knowledge of the ethical, social and professional implications/responsibilities of their work.
5. To inculcate a sense of ethics, professionalism and effective communication skills amongst Engineering graduates.

Program Outcomes (POs) of the Engineering Physics course


Program Outcomes (POs) of the Engineering Physics course in B.Tech. are as follows: Engineering Physics course in B. Tech. has been design to generate the following skills; and abilities amongst the students as stated under (i) through (v)


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below in conformity with PEOs. After the completion of the course, students will be able to:

1. *Apply the concepts of fundamental Physics in their respective fields*
2. *Design and conduct experiments in the relevant areas of physics and as well as to analyze and interpret the results*
3. *Identify, formulate and solved physical problems related to engineering*
4. *Communicate effectively*
5. *Understand the impact of engineering physics in a global, economic, environment and social context*
6. *Use fundamental techniques and skills of physics in modern engineering*


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