SRI VASAVI ENGINEERING COLLEGE (AUTONOMOUS)

(Sponsored by Sri Vasavi Educational Society)
(Approved by AICTE, New Delhi & Permanently affiliated to JNTUK, Kakinada)
(Accredited by NAAC with 'A' Grade & NBA, Recognized by UGC under section 2(f) & 12(B))
Pedatadepalli, **TADEPALLIGUDEM–534 101.**W.G.Dist**. (A.P)**

Date:28-12-2020

Minutes of the Physics Board of studies second meeting held on 28-12-2020 at 12:15 PM through online zoom meeting in the Physics Laboratory

Members present:

S.No	Name of the Member	Designation & Address	Designation on BOS
1	Sri. P. Sita Rama Raju	Assoc. Professor of Physics Sri Vasavi Engineering College	Chairman
2	Prof. G. Padmaja Rani	Professor Dept of UCEK, Kakinada	University Nominee
3	Prof. S.V.S.R. Reddy	Professor Dept of Physics, NIT Warangal	Council Nominee
4	Dr. P. S. V. Subba Rao	Asst. Prof. Department of Physics Andhra University Visakhapatnam	Council Nominee
5	Dr. Ch. V. Srinivas	Dept of Physics, SVCE W, BVRM	Academician
6	Dr. K. Jagadeesh	Sr. Assistant. Professor of physics	Member
7	Sri. B. Sasi Bhushan	Assistant Professor of physics	Member
8	Ms. G. Rama Devi	Assistant Professor of physics	Member
9	Sri. R. Sarath Babu	Assistant Professor of physics	Member
10	Sri. P. Ravi	Assistant Professor of physics	Member

The following items are discussed in the meeting:

Item No-1: Introducing the members of BOS by chairman.

- The chairman of BOS extended a formal welcome and introduced the members.

Item No-2: Syllabi for the courses offered in I and II semesters of B Tech programme.

- The detailed syllabi for the Engineering Physics theory and Engineering Physics Laboratory along with prescribed text books have been presented. With minor changes, the syllabi for the above courses have been approved. The approved syllabi for the courses are given in annexure-I and annexure-II.

Chairman
Board of Studies, Physics section

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ANNEXURE-I
ENGINEERING PHYSICS
(For All Branches)

S.No	Course code	Course Name	L	T	P	C
1	V20PHT01	ENGINEERING PHYSICS	3	1	-	3

After successful completion of the course, the student will be able to:

CO1:	Grasp the basic principles of structure of materials, crystallography and X-ray diffraction.(K2).
CO: 2	Expose the students to the basic concepts of Lasers and their applications in optical fiber communication link (K3).
CO: 3	Classify the applications of sound waves in various fields.(K2).
CO: 4	Interpret wavelike behavior of matter and motivates the need of fundamental physical laws for better understanding of materials. (K3).
CO: 5	Describe the properties of semiconducting materials (K2).
CO: 6	Illustrate the fundamental concepts of dielectrics and Superconductors. (K4).

UNIT-I

CRYSTALLOGRAPHY : Introduction – Space lattice – Basis – Unit Cell – Lattice parameters –Crystal systems- Bravais lattices– Structures and packing fractions of SC,BCC and FCC

X-RAY DIFFRACTION: Directions and planes in crystals – Miller indices – Separation between successive [h k l] planes – Bragg's law-Bragg's x-ray spectrometer.

UNIT-II

LASERS: Introduction –Characteristics of lasers – Spontaneous and Stimulated emission of radiation – Einstein's coefficients –Pumping schemes– Population inversion– Ruby laser- Helium Neon laser-Applications of LASER.

FIBER OPTICS: Introduction –Structure of an optical fiber- Principle of Optical Fiber – Acceptance angle and acceptance cone – Numerical aperture- Basic optical communication system-Advantages of optical fibers over conventional transmission lines.

UNIT – III

ACOUSTICS: Introduction - Sound absorption- Absorption coefficient-Reverberation-Reverberation Time –Basic requirements for constructing an acoustically good hall - Sabine's formula-Factors affecting acoustics of buildings and their remedial measures.

ULTRASONICS: Introduction- Production of Ultrasonic Waves Using Piezoelectric Effect and Magnetostriction Method- Non-Destructive Testing - Pulse Echo Technique – Applications of ultrasonics.

UNIT – IV

QUANTUM MECHANICS: Introduction-de-Broglie's concept of matter waves – Schrodinger's Time Independent& time dependent wave equations –Physical significance of the wave function- Particle in a one dimensional potential box.

FREE ELECTRON THEORY: Classical free electron theory (qualitative) – Assumptions and failures-Quantum free electron theory – Equation for electrical conductivity based on quantum free electron theory-Density of states (3D) - Fermi energy-Fermi – Dirac distribution.

UNIT – V

BAND THEORY OF SOLIDS: Bloch's function (qualitative) – Kronig – Penney model (qualitative)–formation of energy bands in crystalline solids based on Kronig Penny model – E vs K diagram- v vs K diagram- effective mass of an electron-Classification of crystalline solids-concept of hole.

SEMICONDUCTOR PHYSICS: Introduction - Types of Semiconductors-Intrinsic Semiconductors- Carrier concentration– Expression for Conductivity-Extrinsic semiconductors-Carrier concentrations-Dependence of Fermi energy on carrier concentration and temperature-Drift and diffusion currents-Einstein's Equation-Hall Effect-Hall coefficient- Applications of Hall Effect.

UNIT-VI

SUPERCONDUCTIVITY: Introduction- General properties – Meissner effect - Type I and Type II Superconductors- BCS Theory – Josephson effects (AC and DC) - Applications of superconductors.

DIELECTRIC PROPERTIES: Introduction- Types of polarizations- Electronic, Ionic and Orientation polarizations (qualitative) – Internal electric field – Clausius- Mossoti Equation.

Text Books:

1. A Text book of Engineering Physics, M.N. Avadhanulu and P.G.Kshirasagar,S.Chand Publications.
2. Engineering Physics DK Bhattacharya, Poonam and Tandom Publications.

Reference books:

1. Solid state Physics, A.J. Dekker by Mc Millan India Ltd.
2. Introduction to Solid state Physics, Charles Kittle, Willey India Pvt. Ltd.

3. Solid state Physics, S.O. Pillai by New Academic Science.
4. Basic Engineering Physics,Dr.P. Sreenivasa Rao, Himalaya Publishers.
5. Engineering Physics, V. Rajendran, Mc Graw Hill.
6. Engineering Physics, Sanjay D Jain and Girish G Sahasrabudhe., University Press.
7. Engineering Physics, Gaur and Guptha, Dhanpat Rai Publications.
8. Engineering Physics, P.K. Palanisamy, Sci Tech Publishers.

ANNEXURE-II
ENGINEERING PHYSICS LAB
(For All Branches)

S.No	Course Code	Course Name	L	T	P	C
1	V20PHL01	ENGINEERING PHYSICS LAB	-	-	3	1.5

After successful completion of the course, the student will be able to:

CO:1	Analyze the physical principle involved in the various instruments; also relate the principle to new application. (K4).
CO:2	Demonstrate the various experiments in the areas of optics, mechanics and Electronics in all branches of engineering. (K3).
CO:3	Think innovatively and also apply the creative skills that are essential for engineering. (K4).

List of Experiments:

(Any eight of the following to be done)

1. Determination of Rigidity modulus of a material – Torsional Pendulum
2. Determination of acceleration due to gravity – Compound Pendulum
3. Verification of laws of vibrations in stretched strings – Sonometer
4. Determination of velocity of sound – Volume Resonator
5. Verification of Magnetic field Induction along the axis of current carrying coil – Stewart and Gee's apparatus.
6. Determination of Planck's constant using photocell.
7. Determination of wave length of laser source using diffraction grating.
8. Determination of frequency of electrically driven tuning fork - Melde's experiment – Transverse and longitudinal modes.
9. Study of V/I Characteristics of Zener diode.
10. Draw the frequency responsive curves of L-C-R Series Resonance Circuit.
11. Determination of Energy band gap of a Semiconductor p-n junction.
12. Characteristics of Thermistor – Negative Temperature Coefficient of resistivity.

Virtual labs:

(Any two of the following to be done)

1. Crystal Structure.
2. Numerical Aperture of an Optical Fiber.
3. Photo-Electric Effect.
4. Hall Effect.