List of Revised Courses

Department : *Pure and Applied Physics*

Program Name : *B.Sc. (Electronics)*

Academic Year : 2017-18

List of Revised Courses

Sr. No.	Course Code	Name of the Course
01.	**BE-301**	DIGITAL ELECTRONICS- II
02.	**BE-302**	BASIC Electronics- III
03.	**BE-401**	Electromagnetic Theory
04.	**BE-402**	Numerical Techniques

Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2017-18

School : *School of Physical Sciences*

Department : *Pure and Applied Physics*

Date and Time : *December 12, 2016 – 11:30 AM*

Venue : *Smart Class Room*

The scheduled meeting of member of Board of Studies (BoS) of Department of Pure and Applied Physics, School of Studies of Physical Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur, was held to design and discuss the B. Sc. (Electronics) Second year (III and IV Semesters), scheme and syllabi.

The following members were present in the meeting:

1. Dr. R. P. Prajapati
2. Dr. M. N. Tripathi
3. Dr. R. K. Pandey
4. Dr. Parijat Thakur
5. Dr. H. S. Tewari
6. Prof. D. P. Ojha
7. Prof. P. K. Bajpai

The committee discussed and approved the scheme and syllabi. The following courses were revised in the B. Sc. (Electronics) Second year (III and IV Semesters):

- Digital Electronics – II (BE-301)
- Basic Electronics – III (BE-302)
- Electromagnetic Theory (BE-401)
- Numerical Techniques (BE-402)

Signature & Seal of HoD

Scheme and Syllabus

B.Sc. Semester–III (Electronics)

Paper VII (BE-301): DIGITAL ELECTRONICS- II

Objective: To make the student learn and understand the basics of logic gates with CMOS such as NAND/NOR gates and FLIP-FLOP. To understand the concept of number systems and conversions.

Unit – I: Digital Logic Families Bipolar and unipolar logic families, characteristic &digital ICs, Resistor – Transistor logic (RTL), Diode – Transistor logic (DTL), Transistor – Transistor logic (TTL).

Unit II: Flip – Flops and sequential logic design: 1-Bit memory cell, clocked S-R FLIP – FLOP, J-K FLIP- FLOP, D-type Flip – Flops, T-type Flip-Flop.

UNIT- III: Convertors and Memories: Digital to Analog converters, weighted registor D/A converter, R – 2R Ladder D/A converter, ADC, Successive approximation, A/D Converter, counter ramp type ADC.

UNIT-IV: Tuning Circuits: Multivibrators, astable, monostable and bistable multivibrator, circuit diagram analysis and operation.

Outcome: CO2 Model a combinational circuit using hardware description language Varilog HDL and validate its functionality.

References:

1. Principles of Electronics by Mehta V.K.
2. Modern Digital Electronics by R.P. Jain
3. Digital Electronics: Malvino and Leech

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Dept. of Pure & Applied Phys
गुरु घासीदास विश्वविद्यालय
Guru Ghasidas Vishwavidya
बिलासपुर (छ.ग.)
Bilaspur (C.G.)

Paper VIII (BE-302): BASIC Electronics -III

Objective: This course is designed to develop basic understanding of passive electronic components and their response under DC and AC signal using network theorems.

UNIT-I: Tuning circuit: parallel resonant circuit, quality factor, frequency response and bandwidth, decibel system, tuned amplifier, Single Stage Amplifiers, Output Power of Amplifier, classification of amplifiers

UNIT-II: Class A, class B and class C amplifiers, push pull amplifier, Multistage Amplifiers: R-C coupled, Impedance coupled, Transformer-Coupled and Direct-Coupled Amplifiers

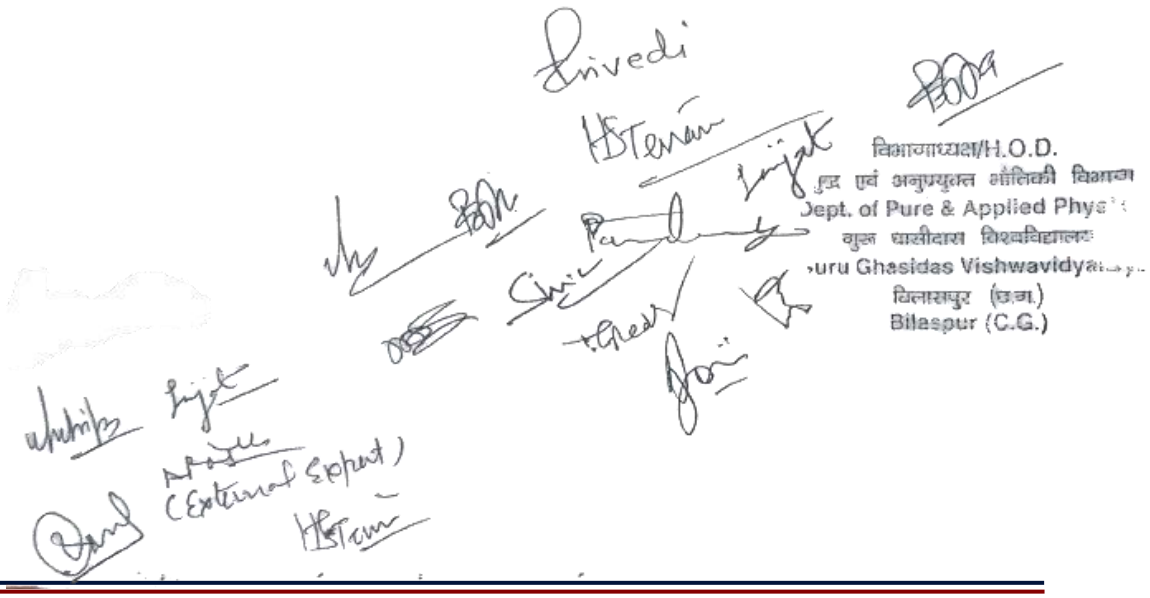
UNIT-III: Feedback in amplifiers: principal of positive and negative feedback, gain of negative feedback amplifier, advantage of negative feedback in amplifiers Oscillators: principle of oscillators, circuit requirement for self excited oscillations, basic analysis of Phase Shift, Hartley, Colpitt and Wien bridge oscillators.

UNIT-IV: Operational amplifiers: requirements of an ideal OP-amplifier, gain of inverting and non-inverting OP-amplifier, basic idea of common mode gain, difference gain, common mode rejection ratio, application of OP-amplifier (addition, multiplication, integration and differentiation)

Outcomes: Understanding the passive electrical circuit elements such as resistances, capacitance and inductance, source of electrical energy, analysis of linear electrical circuit under DC and AC electrical signal.

References:

1. OP-AMP and Linear Integrated Circuits: Gayakwad
2. Electronic Fundamentals and Applications: J.D. Ryder
3. Electronic circuit Analysis: U.A. Bakshi
4. Electronic Principles: A. Malvino & David J. Bates



Semester IV

Paper – X (BE-401): Electromagnetic Theory

Objectives: Better understanding of electromagnetic waves and fundamentals. Ability to solve the problems in different EM fields.

Unit–I: Vectors & scalars, addition, subtraction, multiplication (dot and cross products); Gradient of a scalar field and its geometrical interpretation, Divergence and Curl of a vector field, line, surface and volume integral. Gauss's Divergence Theorem, Stokes Theorem.

Unit–II: Gauss's Law and its application for finding electric field, calculation of electric field for symmetric charge distributions (Infinitely long rod of uniform charge density, Infinite plane of charge, & Non – conducting solid sphere), Field at the surface of a conductor, Dielectrics, polarization and polarization vector (P), displacement vector (D), electric susceptibility, dielectric constant, relation between E, D, & P., current density, charge density and continuity equation.

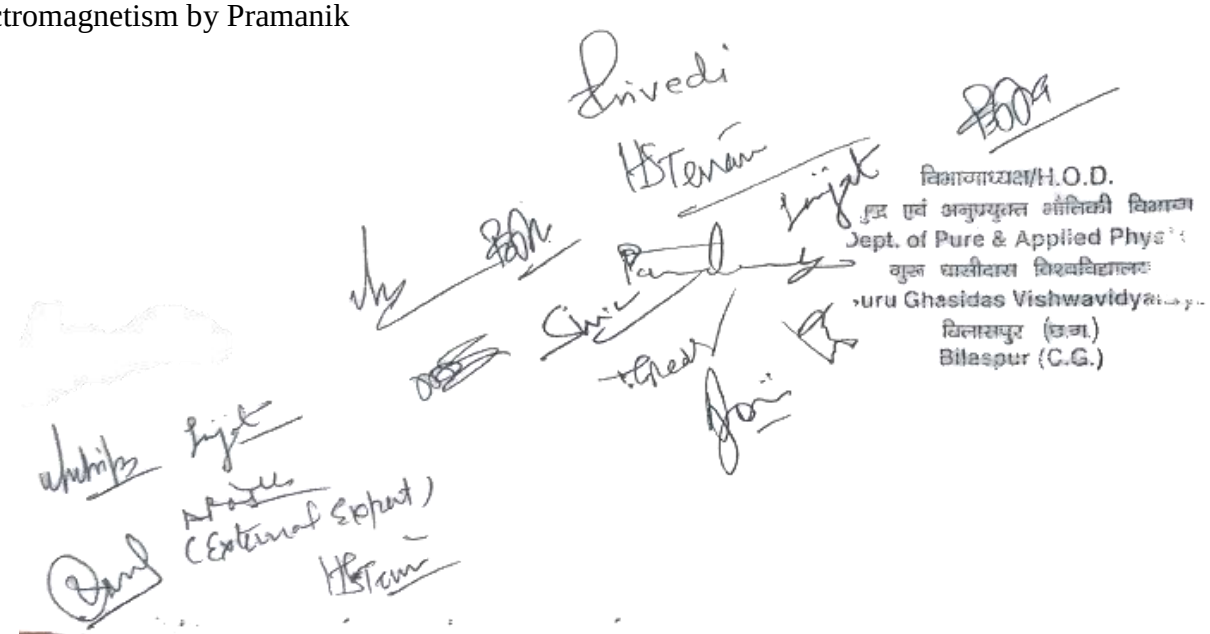
Unit–III: Ampere's law and it's application for finding the magnetic field inside and outside a current carrying wire, Solenoid and Toroid. Faraday's law of induction, Lenz law, Motional Electromotive force, Induced electric field, Magnetization, magnetic susceptibility and permeability.

Unit IV: Concept of Maxwell's Displacement current, Guass's law of Magnetism, Maxwell's Equations.

Outcomes: Understand characteristics and wave propagation through transmission line.

Text Books:

1. Electricity and Magnetism: Tiwari and J.D.Dubey
2. Fundamentals of Electromagnetic Theory: Reitz, Milford and Christy
3. Introduction to Electromagnetics by Griffiths
4. Electromagnetism by Pramanik



Paper – XI (BE-402)

Numerical Techniques

Objectives: To provide a strong mathematical foundation in differential equations. To enhance problem solving skills and to give the ability to formulate, interpret and draw inference from the mathematical solutions.

Unit 1: Numerical Methods: Floating point, Round-off error, Error propagation, Stability Solution of Transcendental and Polynomial Equations f(x)=0: Bisection method, Secant and Regula Falsi Methods, Newton Raphson method, Muller Method, Rate of convergence, General Iteration Methods.

Unit 2: Interpolation and Polynomial Approximations: Taylor Series and Calculation of Functions, Langrange Interpolation, Newton Divided Difference Interpolation (forward and backward difference formulae), Truncation errors. **Curve Fitting**: Least square fitting, Curve fitting.

Unit 3: Numerical Integration: Trapezoidal Rule, Error bounds and estimate for the Trapezoidal rule, Simpson's Rule, Error of Simpson's rule, Gauss Integration formula.

Unit 4: Numerical Methods in Linear Algebra: Linear systems Ax=B, Gauss Elimination, Partial Pivoting, Matrix Inversion, Gauss-Jordon Methods.

Outcome: Student will learn the various methods of solving differential equation. Fruther, they will also learn the properties of beta and gamma functions and their applications.

References:
1. R.V. Dukkipati, Numerical Methods, New Age International (2010)
2. S. S. Sastry, Introductory Methods of Numerical Analysis, Prentice Hall India (2008).
3. M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods:

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