



**List of Courses Focus on Employability/ Entrepreneurship/  
Skill Development**

**Department : Pure and applied physics**

**Programme Name : B.Sc. (Hon.) Electronics**

**Academic Year : 2016-17**

**List of Courses Focus on Employability/ Entrepreneurship/Skill Development**

Sr. No.	Course Code	Name of the Course
01.	BE-302	Basic Electronics- III
02.	BE-501	Microprocessor & microcontroller
03.	BE-503	Electronic Instrumentation & Digital Signal Processing
04.	BE-504	Analog Communication -I
05.	BE-601	Analog Communication-II
06.	BE-602	Digital Communications
07.	BE-603	Advanced Electronic Instrumentation
08.	BE-604	Fiber Optics and Optoelectronics



## Scheme and Syllabus

### 5 Year Integrated U.G. in Electronics

Semester-I	Marks	Semester-III	Marks
BE-101 Network theorem & AC circuits	50	BE-301 Digital Electronics- II	50
BE-102 Basic electronics –I	50	BE-302 <b>Basic Electronics- III</b>	50
BE-103 Laboratory-I	50	BE-303 Lab-III	50
Semester-II	Marks	Semester-IV	Marks
BE-201 Digital Electronics-I	50	BE-401 Electromagnetic Theory	50
BE-202 Basic Electronics –II	50	BE-402 Numeric Technique	50
BE-203 Laboratory-II	50	BE-403 Laboratory-IV	50
Semester-V	Marks	Semester-VI	Marks
BE-501 <b>Microprocessor &amp; microcontroller</b>	50	BE-601 <b>Analog Communication-II</b>	50
BE-502 Wave propagation	50	BE-602 <b>Digital Communications</b>	50
BE-503 <b>Electronic Instrumentation &amp; Digital Signal Processing</b>	50	BE-603 <b>Advanced Electronic Instrumentation</b>	50
BE-504 <b>Analog Communication -I</b>	50	BE-604 <b>Fiber Optics and Optoelectronics</b>	50
BE-505 Laboratory-V	50	BE-605 Laboratory-VII	50
BE-506 Lab.-VI	50	BE-606 Project Work	150



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

**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: principle 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)

**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

*[Handwritten signatures and notes]*

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)  
Bilaspur (C.G.)



Semester V

Paper-XIII (BE-501): Microprocessors and Microcontrollers

**Unit I: Fundamentals of Microprocessors:**

Introduction, An ideal microprocessor, the data bus, address bus, control bus, microprocessor based system- basic operation, microprocessor operation, microprocessor architecture, instruction set, 8085 and 8086 microprocessor

**Unit II: Programming of microprocessors:** Introduction, assembly languages, High-Level Language,

application of various language, stacks, subroutines, system software, Programmable DMA controller, Programmable interrupt controller (PIC), programmable communication interface

**Unit III: Microprocessor based data Acquisition system:** Introduction, analog to digital convertor,

clock for A/D convertor, sample and Hold circuit, Analog multiplexer, ADC 0800,

**Unit IV: Microprocessor applications:** Delay subroutines, 7-segment LED display, Microprocessor

based protective relay, Microcomputer development system, single chip microcomputer, I/O processor, Coprocessor.

**References:**

1. Fundamental of Microprocessor and microcomputers by B. Ram
2. Digital Computer Electronics- an introduction to microcomputers by A. P. Malvino
3. Digital Computer Electronics by Malvino and Brown

*(Handwritten signatures and stamps)*

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)  
Bilaspur (C.G.)





**Paper XVI (BE-504): Electronic Instrumentation & Digital Signal Processing**

**Unit I Basic Measurement Instruments:** DC measurement: dc voltmeter, ohmmeter and ammeter. Digital type voltmeter, ammeter and ohmmeter, digital multimeter, AC measurement, voltmeter, ammeter. Digital frequency meter: elements of frequency meter, universal counter and its different modes, measurement errors and extending the frequency range. Digital LCR-Q meter, digital wattmeter.

**Unit II Signal Generators:** Types of generators and their operation: The sine wave generator, Audio oscillator, Function generators, Pulse generators, AF signal generator, RF generators, Random noise generators.

**Unit III Probes and Connectors:** Test leads, active and passive probes, shielded cables, connectors, low capacitance probes, high voltage probes, RF demodulator probes, special probes for IC's, current probes.

**Unit IV: Digital Signal Processing (DSP):** Introduction to signals, signal processing systems, concept of signal processing, basic elements of digital signal processing (DSP), comparison between DSP and analog signal processing

**References:**

1. Electronic Instrumentation by H.S. Kalsi
2. Elements of Electronic Instrumentation and Measurement by Joseph J. Carr
3. Instrumentation Devices and Systems by C.S.Rangan, G.S.Sarna and V.S.Man
4. Digital Signal Processing by Oppenheim and Schaffer

*(Handwritten signatures and notes)*

विभागाध्यक्ष/H.O.D.  
पुर एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)  
Bilaspur (C.G.)











**Paper-XXI (BE-603) Advance Electronic Instrumentation**

Unit-I Transducers and its classifications, Criteria for selecting a transducer, Active and passive electrical transducer, Strain Gauge, Gauge Factor, Gauge materials and configuration, displacement transducers, capacitor, inductive, Differential transformers (LVDT), photoelectric and piezoelectric transducers, photo sensitive devices, resistance thermometers, thermistors and thermocouples.

Unit – II Introduction to Oscilloscopes, Cathode ray tube, vertical and horizontal deflection system, delay lines, oscilloscope probes and transducers, elementary ideas about storage and sampling oscilloscope. Applications of oscilloscope.

Unit – III Feedback fundamentals, inverse transducers, temperature balance system, self balancing potentiometers, self balancing bridges, beam balance systems, servo operated manometers, Non contact position measurements.

Unit – IV Data display and recording systems: Data loggers, analog and digital readout systems, Alphanumeric and CRT readout systems, cathode ray oscilloscope as analog recorder, Magnetic tape recorder, optical and magnetic encoders and decoders, digital I/O devices.

Reference:

1. Transducers and Instrumentation – Murty D V S
2. Modern Electronic Instrumentation and Measurement Techniques – Helfrick A D and Cooper W D
3. Electrical and Electronic Measurements and Instrumentation – Sahney A K
4. Measurement, Instrumentation and Experimental Design in Physics and Engineering – Sayer and Mansingh

*(Handwritten signatures and stamps)*

विभागाध्यक्ष/H.O.D.  
शुद्ध एवं अनुप्रयुक्त भौतिकी विभाग  
Dept. of Pure & Applied Physics  
गुरु घासीदास विश्वविद्यालय  
Guru Ghasidas Vishwavidyalaya  
बिलासपुर (छ.ग.)  
Bilaspur (C.G.)

