Gondwana University, Gadchiroli

Proposed Syllabus

B.Sc. III

Subject: Electronics

Semester - V

Board of Studies - Electronics

Gondwana University, Gadchiroli

Scheme of Bachelor of Science for Semester Examination

Gondwana University, Gadchiroli

Subject: Electronics

Class	Semester	Paper	Teaching Scheme Per Week			Examination Scheme						
			Theory	Total	Practical	Theory Marks					Practical Marks	Total Marks
						Paper	Internal Assessment					
							P-1	P-2	T			
B.Sc. I	I	I	3	6 + 1T*	6	50	10	10	20		30	150
		II	3			50						
	II	I	3	6 + 1T*	6	50	10	10	20		30	150
		II	3			50						
B. Sc. II	III	I	3	6 + 2T*	6	50	10	10	20		30	150
		II	3			50						
	IV	I	3	6 + 2T*	6	50	10	10	20		30	150
		II	3			50						
B.Sc. III	V	I	3	6 + 2T*	6	50	10	10	20		30	150
		II	3			50						
	VI	I	3	6 + 2T*	6	50	10	10	20		30	150
		II	3			50						

* Periods for Tutorials per batch.

Pattern of Question Papers (UG)

Time   :   3 Hours

Maximum marks   :   50

Question No.   Marks Allotted

Qu. 1 Either

      From Unit - I   10
      Or
      From Unit - I   10

Qu. 2 Either

      From Unit - II   10
      Or
      From Unit - II   10

Qu. 3 Either

      From Unit - III   10
      Or
      From Unit - III   10

Qu. 4 Either

      From Unit - IV   10
      Or
      From Unit - IV   10

Qu. 5 Attempt any 10

      (a) Unit - I   2.5

(b) Unit - II	2.5
(c) Unit – III	2.5
(d) Unit – IV	2.5

The above pattern is for all two papers of each semester of B.Sc. I, B.Sc. II and B.Sc. III, w.e.f. 2014-15.

Details of the Syllabus

B.Sc. III - Semester-V

Subject: Electronics

Scheme for Semester-V

W.E.F. 2014-15

The paper-I "**Microprocessor, Interfacing and PPI Devices**" of semester-V is compulsory, and the **paper-II (optional)** is from **Elective-I & II.**

The Elective-**I** is "**C-programming-I**" and the Elective-II is "**Electronic Instrumentation and communication-I**".

Paper	No. of Periods per week (48 minutes each)			Marks					
	Lecture	Practical	Tutorial	Theory	Internal Assessment			Practical	Total
					P-1	P-2	T		
Paper–I(*compulsory*) Microprocessor, Interfacing & PPI devices	3	6	2	50	10	10	20	30	150
Paper–II (**Elective-I/ Elective-II**) C-programming-I / Electronic Instrumentation and communication-I	3			50					

B.Sc. III: (Electronics)
(Semester-V)
Paper- I (*compulsory*)
(Microprocessor, Interfacing & PPI devices)

UNIT-I:
Intel 8085 microprocessor: Block diagram, ALU, Timing and Control Unit, General purpose Registers, Instruction decoder, Flags, PC & SP, Interrupts, Address and Data line multiplexing, Data and Address Bus. Instruction and data Format. *Instruction Cycle:* Fetch Operation; Execute Operation, Machine Cycle and T-State. Timing Diagram: Timing Diagram for Opcode Fetch, Memory Read/Write, I/O Read/Write.

UNIT-II:
Addressing Modes: Direct Addressing, Register Addressing, Register Indirect Addressing, Immediate Addressing and Implicit Addressing. *Instruction Set:* Data Transfer Group, Arithmetic Group, Logical Group, Branch Group, Stack, I/O and Machine Control Group.

Flowchart and structured programming. Simple Assembly language programming (ALP), Subroutine and stack operation.

UNIT-III:

Interfacing: Need of Interfacing, *Address space Partitioning*: Memory Mapped I/O Scheme and I/O Mapped I/O Scheme, *Memory and I/O interfacing*: *Memory interfacing, I/O interfacing, Data Transfer Schemes*: Programmed Data Transfer Schemes, Synchronous, Asynchronous and Interrupt driven data transfer, DMA data transfer scheme: burst mode &cycle stealing mode and their limitations.

UNIT-IV:

Interfacing devices: Introduction, Programmable Peripheral Interface (*PPI*) *Intel 8255*: Block diagram with discussion on each block, operating modes of 8255, Control Groups and Control Word, I/O Ports, *Programmable Counter/Interval Timer Intel 8253*: Schematic Diagram, Read/Write Logic, Control Word, Operation (Mode 0-Mode 5). *Programmable DMA Controller, Intel 8257*: Schematic Diagram, I/O signals. BSR (Bit Set/Reset) Mode

Ref. Books:
1. Fundamentals of Microprocessor and Microcontrollers by B. Ram,
2. 8085 Microprocessor and its Applications, by A. Nagoor Kani. (Tata MGH Pub.)
3. Microprocessor, Architecture, Programming, and Applications with 8085 by Ramesh S. Gaonkar,
4. Microprocessors and Interfacing by Douglas V. Hall,
5. Digital circuits and microprocessors by Taub.
6. Introduction to microprocessor by A P Mathur.
7. Microprocessors and Interfacing techniques Rodney Zaks and Austin Lesea (BPB).
8. Microcomputer System the 8086/8088 Family: Gibson.
9. Microprocessor, Principles and Applications by Ajit Pal.
10. Microprocessors by K. M. Hebber and K.C. Shet.

C-programming-I

Unit-I

Concepts of Algorithm and Flowcharts, problem solving examples using algorithm and Flowchart. Types of Programming languages, Characteristics of higher level language, Compiler and Interpreter, Importance of C.

Constants, Variables and data Types: Character Set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of Variables, Defining symbolic constants.

Unit-II

Operators and Expressions:
Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise and special operators.
Arithmetic Expression, Evaluation of Expression, Precedence of Operators and Associatively, Library Functions I/O Statements.

Unit-III

Managing Input and Output Operators**:** Reading a character, writing a character, formatted input, formatted output.
Decision making and branching: Decision making with IF statement, Simple IF statement, the IF ELSE statement,
Nesting of IF … ELSE statements, The ELSE IF ladder, the switch statement, the turnery (? :)
Operator, the GOTO statement.

Unit-IV

Decision making and Looping:
The WHILE statement, the DO statement, The FOR statement, Nesting in loop, Jumps in loops, Break and continue.

Ref. Books:

1. Programming in BASIC by Balagurusamy,
2. ANSI C- Programming Balagurusamy,
3. Let us C Kanetkar,
4. C and C++ Kanetkar,
5. Programming in "C" and "C++" by, Mahapatra
6. Programming in "C" by Rajaraman.

Unit-I

Measurements and Errors: Accuracy and Precision, Significant Figures, Types of Errors, Statistical Analysis, Probability of Errors, Limiting errors. VCO (IC 565), PLL (IC566), voltage to current and current to voltage converter and Impedance level transformation.

Unit-II

Counters and pulse width counters, concept of asynchronous counters, decade, down, mod, shift, synchronous and up-down pulse width modulator, frequency dividers, multipliers by shift keying, Trigger and delay sweep, Discrete pulse delay circuit, pulse sequencing, Display system

Unit-III

Concept of Communication, Types of Communication: Simplex, Duplex, Analog, digital, baseband and modulated, E. M. waves, E. M. Spectrum, Concept of modulation and Demodulation, Types of Modulation: Amplitude, Frequency, Phase, Needs of Modulation.

Unit-IV

Perfect Modulation, Over Modulation, Under Modulation, Theory of Amplitude Modulation, Modulation Index, A. M. Spectrum, Modulation index, Frequency Modulation: definition and its waveforms, Modulation factor in F. M., Frequency deviation, Deviation ratio, Deviation ratio, Carrier swing. Difference between A. M. and F.M. (Simple numerical are expected on A.M. and F. M.)

Ref. Books:
1. Instrumentation measurement and feedback, Barry and Jones,
2. Digital instrumentation , A J Bouwens
3. Introduction to system design using ICs B S Sonde.
4. Digital principle and Applications by Malvino and Leach.
5. Digital Electronics by R. L. Tokheim.
6. Instrumentation measurement and analysis by B C Nakra and K K Chaudhary.
7. Linear Integrator circuits by K R Botkar.
8. Electronic Instrumentation and Measurement Techniques- W.D. Cooper, A.D. Helfrick
9. Electronic Communication – D. Frenzel
10. Electronic Communication system – Roddy Coolen
11. Electronic Communication system- George Kennedy

12. Fiber Optic Communication- D.C. Agarwal
13. Fiber Optic Communication-Gerd Keiser
14. Satellite Communication – Robert Gagliaradi

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Internal Assessment (20 marks):

	P-1(10)	P-2(10)	T (20)
	Marks		
Attendance	03	03	06
Home assignment	04	04	08
Seminar/ Industrial Visit/ Workshop Practice	03	03	06

PRACTICALS for the semester-V

It is divided into two sections i.e. Section-A and Section-B. At least five experiments from compulsory paper (**section-A**) and five experiments from optional / elective paper (**section-B**) must be performed and the practical record book duly signed should be submitted at the time of examination. Each student is expected to perform one experiment from each section in the University Examination. The duration of practical examination is six hours.

Marks Distribution:

	Record	Experiment	Viva	Total	
Section – A	3	9	3	15	
Section – B	3	9	3	15	
			Total	30	

LIST OF EXPERIMENT

Section-A: (*Compulsory paper*)
1. ALP (Microprpcessor-8085), for data transfer.
2. ALP (Microprpcessor-8085), for addition of 8-bit numbers (Hex and Decimal)
3. ALP (Microprpcessor-8085), for 8-bit subtraction.
4. ALP (Microprpcessor-8085), for multiplication.

5. ALP (Microprpcessor-8085), for Division
6. ALP (Microprpcessor-8085), for 1's and 2's complement of 8-bit numbers.
7. ALP (Microprpcessor-8085), for masking of 4 most and least significant bits of 8-bit numbers.
8. Study of ALU (IC74181).

Section-B: Elective-I -C-programming:
1. At least 2 programs based on C-operators and expressions.
2. At least 2 programs on Input / Output.
3. At least 2 programs on decision making and branching using if, if-else, switch statements.
4. At least 2 programs on decision making and branching using if, if-else, switch statements.
5. At least 2 programs on decision making and branching using nesting of if-else and else-if ladder.
6. At least 2 programs on decision making and looping using while statement.
7. At least 2 programs on decision making and looping using do-while statement.
8. At least 2 programs on decision making and looping using for statement.
9. At least 2 programs on nesting of loops.

Section-B: *Elective-II –Electronic instrumentation and communication*-**I:**

1. Study of VCO, IC566.
2. Study of PLL, IC565.
3. Design and study of Voltage to current converter
4. Design and study of Current to voltage converter
5. Design and study of Frequency multiplier
6. Study of Pulse width counter.
7. Construction and study of simple frequency meter.
8. Study of discrete dual slope ADC.
9. Study of averaging circuit and rms function using electronic circuit.
10. Study of Linearization of thermistor.

Note: An Industrial visit / Study tour should be arranged for the student after semester-V.