

**SYLLABUS FOR SIX SEMESTERS
BACHELOR of SCIENCE (B.Sc.) (GENERAL) DEGREE
PROGRAMME IN THE SUBJECT OF ELECTRONICS FROM
THE YEAR 2014**

ELECTRONICS

(Semester-III)

(For examinations to be held in the years 2015, 2016, 2017)

Course No. : EL-301(Theory)

Duration: 3 hours

Title: Electronic Instrumentation

Maximum Marks: 100

Credits: 4

Theory Examination: 80 Marks

Internal Assessment: 20 Marks

Unit-I: *Electronic Instrument*

Basic PMMC movement; AC voltmeter using rectifiers; RMS responding voltmeter; Electronic millimeter; Differential voltmeter; Digital voltmeter; Ramp type; Successive approximation; Continuous balance; Q-meter; RF Power meter and Voltage measurement.

Unit-II: *Oscilloscopes*

Oscilloscopes: Block Diagram ; CR tube; Electrostatic Deflection; CRT Screen ;CRT circuits; Vertical deflection system; Horizontal deflection system; Delay line; Oscilloscope prober; Oscilloscope techniques; Measurement of frequency, Phase angle and Time delays; Sampling Oscilloscope; Storage Oscilloscopes.

Unit-III: *Transducers*

Classification: Capacitive and Inductive transducers; variable differential transformers, Oscillation transducers; Strain Gauge; Resistance thermometer; Thermocouple; Thermostats; Photoelectric and Piezoelectric transducers; Potentiometer and Velocity Transducers ; Photosensitive devices ; Photoconductive and Photovoltaic cells.

Unit-IV: *Operational Amplifier*

Ideal Op-AMP properties; Configurations; Inverting and Non-inverting; Differential and common mode; Parameters: input offset; input bias current; input offset current; slew rate and common mode rejection ratio; Op-Amp applications; Differentiator and Integrator; Voltage to current converter and Current to Voltage converter and Op-Amp square and triangular wave generators.

Unit –V: *special Purpose ICs*

Phase Locked Loop (PLL) and Voltage controlled oscillators (VCO's); PLL frequency synthesize; radiation detector; Charged couple devices (CCD's); Waveform generators; Timer 555 as astable, Mono-stable and Bistable multivibrator and Op-Amp square and Triangular wave generators.

Note for paper setter:

The question paper will contain three sections A, B & C.

Section A will consist of ten very short answers type questions, two from each unit, carrying 2 marks each. All the questions in section A will be compulsory. (20 **Marks**)

Section B will consist of ten short answer type questions, two from each unit with internal choice. Student will be required to attempt any five questions, each question carrying 6 marks. (30 **Marks**)

Section C will have 5 long answer type questions one from each unit, carrying 10 marks. Student will be required to attempt any 3 questions. (30 **Marks**)

Books for Study and Reference:

1. Electronic Instrumentation and Measurement Techniques – W.D.Cooper & A.D. Halftrack, Prentice Hall of India.
2. A course in Electrical and Electronic Measurements and Instrumentation – A.K. Sawhney, Dhanpat Rai and Sons.
3. Operational Amplifier : Ramakant Gayakwad, Linear Integrated Circuit : D.Roy Choudhary & Shail B. Jain.
4. Electronic Devices and Circuit theory: Robert L Boylsted & Louis Nashlesky

ELECTRONICS

(Semester-III)

(For examinations to be held in the years 2015, 2016, 2017)

Course No. : EL-301(Practical)

**Title: Lab Course in Electronic
Instrumentation**

Duration: 3 hours

Maximum Marks: 50

Credits: 2

External Examination: 25 Marks

Internal Examination: 25 Marks

Note: Each of the students has to perform a minimum of 06 experiments selecting at least one experiment from each of the following topics:

Set I: Voltage, Current, Power and Frequency measurement

SetII: Transducers

SET III: Operational Amplifier

Note for distribution of 25 Marks in internal Assessment in Practical Examination

i) Ist assessment on the basis of day-to-day performance in the Laboratory: 06 Marks

ii) 2nd assessment on the basis of day-to-day performance in the Laboratory: 06 Marks

iii) Class Test : 08 Marks

iv) Regularity of Attendance : 05 Marks

ELECTRONICS
(Semester-IV)
(For examinations to be held in the years 2016, 2017, 2018)

Course No. : EL-401(Theory)
Duration: 3 hours

Title: Digital Electronics
Maximum Marks: 100

Credits: 4

Theory Examination: 80 Marks
Internal Assessment: 20 Marks

Unit I. Logic Circuits

Logic gates; number systems and their conversions: binary, octal, decimal, and hexadecimal; binary arithmetic: compliment, addition, subtraction, multiplication, and division; binary codes: 8421, BCD, Excess-3 Gray, and ASCII; digital logic families: RTL; DTL, TTL (open collector, totem pole, Schottky, Tristate gate), and CMOS (basic logic and transmission gates).

Unit II Combinational logic

Boolean algebra: basic definitions, axioms, functions, and simplifications; conversion between canonical forms; minimization and realization techniques: K-maps (4 variable) and MQ method (with exercises); half and full adders; subtractors, parity checkers; magnitude comparators; decoders and encoders.

Unit III Sequential logic

Flip flops: RS, D, JK, JK Master-slave, and T; counters: ripple, BCD, and binary; synchronous: binary up down, BCD parallel loading timing sequences, ring and Johnson counter.

Unit IV Memories

Registers: serial-in-serial out, serial-in-parallel out, parallel-in-serial out, and parallel-in-parallel out; shift registers: unidirectional and bidirectional; serial addition; ROM: PROM, EPROM, and EEPROM; Ram: static and dynamic,

Unit V A/D and D/A converters

DAC's specifications; DAC's types: binary weighted resistor, R-2R ladder; ADC's specifications; ADC's types: successive approximation simultaneous A/D conversion, counter method continuous A/D conversion, and dual slope method.

Note for paper setter:

The question paper will contain three sections A, B & C.

Section A will consist of ten very short answers type questions, two from each unit, carrying 2 marks each. All the questions in section A will be compulsory. (20 Marks)

Section B will consist of ten short answer type questions, two from each unit with internal choice. Student will be required to attempt any five questions, each question carrying 6 marks. **(30 Marks)**

Section C will have 5 long answer type questions one from each unit, carrying 10 marks. Student will be required to attempt any 3 questions. **(30 Marks)**

Books for Study and Reference:

- 1 Thomas L.Floyd, Digital Fundamentals Universal Book Stall, New Delhi.
- 2 Malvino and Leach, Digital Principle and Applications, Tata McGraw-Hill, New Delhi.
- 3 M. Moris Mano, Digital logic Design Prentice-Hall of India, New Delhi.

ELECTRONICS

(Semester-IV)

(For examinations to be held in the years 2016, 2017, 2018)

Course No. : EL-401(Practical)
Duration: 3 hours

Title: Lab Course in Digital Electronics
Maximum Marks: 50

Credits: 2

External Examination: 25 Marks
Internal Examination: 25 Marks

Note: Each of the students has to perform a minimum of 06 experiments selecting at least one experiment from each of the following topics:

Set I: Logic Gates

SetII: Combinational Circuits

SET III: Sequential Circuits

Note for distribution of 25 Marks in internal Assessment in Practical Examination

- i) Ist assessment on the basis of day-to-day performance in the Laboratory: 06 Marks
- ii) 2nd assessment on the basis of day-to-day performance in the Laboratory: 06 Marks
- iii) Class Test : 08 Marks
- iv) Regularity of Attendance : 05 Marks

ELECTRONICS
(Semester-V)
(For examinations to be held in the years 2016, 2017, 2018)

Course No. : EL-501(Theory)

Title: Electronic Communications

Duration: 3 hours

Maximum Marks: 100

Credits: 4

Theory Examination: 80 Marks

Internal Assessment: 20 Marks

UNIT I. *Waves and Antennas*

Frequency spectrum; propagation of waves: free space, tropospheric, and ionospheric propagation; surface waves; low frequency & very low frequency propagation; ELF propagation; extra-terrestrial communication; antennas: equivalent circuits, radiation fields, polarization, ionospheric radiation, power gain; Hertzian dipole; grounded and ungrounded antennas.

UNIT II *Amplitude modulation and demodulation*

Amplitude modulation: representation and frequency spectrum; power relations; collector and FET square law modulators; single side band techniques; suppression of carrier; balanced modulator; detection of AM waves using envelope detector.

UNIT III *Angle modulation*

FM wave: representation and frequency spectrum; phase modulation; intersystem compressions; effect of noise; pre-emphasis and de-emphasis; generation of FM; detection of FM: Foster-Seely discriminator and ratio detector.

UNIT IV *Television*

Principle of TV communication; TV systems and standards; scanning and blanking pulses, composite video signal; TV camera tubes: vidicon and plumbicon; picture tube; introduction to colour TV; PAL encoder and decoder.

UNIT V *Advanced communication*

Pulse communication: pulse amplitude, pulse width, pulse position; pulse code modulation: principle, quantization, and quantization noise, facsimile transmission: facsimile sender and receiver, transmission of facsimile signals; satellite communication: introduction, orbits, station keeping, satellite altitude, transmission path, path loss, and noise considerations; fibre optic communications: introduction, principles, and advantages.

Note for paper setter:

The question paper will contain three sections A, B & C.

Section A will consist of ten very short answers type questions, two from each unit, carrying 2 marks each. All the questions in section A will be compulsory. (20 **Marks**)

Section B will consist of ten short answer type questions, two from each unit with internal choice. Student will be required to attempt any five questions, each question carrying 6 marks. (30 **Marks**)

Section C will have 5 long answer type questions one from each unit, carrying 10 marks. Student will be required to attempt any 3 questions. (30 **Marks**)

Books for Study and Reference:

1. Dennis Roddy, **Electronic Communications**, Prentice-Hall of India, New Delhi.
2. George Kennedy, **Electronic Communication systems**, McGraw-Hill Book Company.
3. John D. Kraus, **Electromagnetics**, McGraw-Hill International Book Company.
4. Sudhir K. Pandey, **Handbook of Satellite Communication**, Authors press, New Delhi.

ELECTRONICS

(Semester-V)

(For examinations to be held in the years 2016, 2017, 2018)

Course No. : EL-501(Practical)

**Title: Lab Course in Electronic
Communication**

Duration: 3 hours

Maximum Marks: 50

Credits: 2

External Examination: 25 Marks

Internal Examination: 25 Marks

Note: Each of the students has to perform a minimum of 06 experiments selecting at least one experiment from each of the following topics:

Note: Each of the students has to perform a minimum of 06 experiments selecting at least one experiment from each of the following topics.

Set I: Amplitude modulation and Demodulation

SetII: Frequency modulation and Demodulation

SET III: Digital modulation

Note for distribution of 25 Marks in internal Assessment in Practical Examination

i) Ist assessment on the basis of day-to-day performance in the Laboratory: 06 Marks

ii) 2nd assessment on the basis of day-to-day performance in the Laboratory: 06 Marks

iii) Class Test : 08 Marks

iv) Regularity of Attendance : 05 Marks

ELECTRONICS
(Semester-VI)
(For examinations to be held in the years 2017, 2018, 2019)

Course No. : EL-601(Theory)

**Title: Microprocessor & Computer
Programming**

Duration: 3 hours

Maximum Marks: 100

Credits: 4

Theory Examination: 80 Marks

Internal Assessment: 20 Marks

UNIT I *Microprocessor architecture*

Introduction: Architecture of 8085: address bus, data bus, control bus, and registers; internal data operations; externally initiated operations; demultiplexing AD7-AD0; generating control signals; bus timings: opcode fetch, memory read, and memory write.

UNIT II *Assembly language programming-I*

8085 programming model; instruction classification; instruction formats; addressing modes; data transfer instructions; arithmetic operations; logic operations; branch operations; simple programming examples; Looping: continuous loop and conditional loop.

UNIT III *Assembly language programming-II*

Additional data transfer and 16 bit arithmetic instructions; logic operations: compare and rotate; counters and time delays: using single registers and register pairs; Interrupt, stacks, subroutine interfacing: block diagram, working, and programming of 8255 and 8253.

UNIT IV *C programming-1*

Identifiers and key words; data types; operators: arithmetic, unary, relational, logical, assignment and conditional: operators precedence; data input and output statements; simple programming examples; control statements.

UNIT V *C programming-II*

Functions: passing arguments to a function and recursion; arrays: passing arrays to functions and multidimensional arrays; strings; pointers; structures and unions; data files; simple programming examples.

Note for paper setter:

The question paper will contain three sections A, B & C.

***Section A** will consist of ten very short answers type questions, two from each unit, carrying 2 marks each. All the questions in section A will be compulsory. (20 **Marks**)*

***Section B** will consist of ten short answer type questions, two from each unit with internal choice. Student will be required to attempt any five questions, each question carrying 6 marks. (30 **Marks**)*

***Section C** will have 5 long answer type questions one from each unit, carrying 10 marks. Student will be required to attempt any 3 questions. (30 **Marks**)*

Books for Study and Reference:

1. Ramesh Gaonkar, **Microprocessor Architecture, Programming, and Applications with 8085**, Penram international publications, New Delhi.
2. Schaum series, **Programming with C**, Tata McGraw-Hill, New Delhi.

ELECTRONICS
(Semester-IV)
(For examinations to be held in the years 2017, 2018, 2019)

Course No. : EL-601(Practical)

**Title: Lab. 1. Course in 8085 μ p and
Programming using C
2. Project work**

Duration: 3 hours

Maximum Marks: 50

Credits: 2

External Examination: 25 (Labwork: 15, Project: 10)

Internal Examination: 25 (Labwork: 15, Project: 10)

Note: Each of the student has to perform a minimum of 04 experiments selecting at least one experiment from each of the following topics. In addition student will have to undertake a project work.

Set I: Simple programming with 8085

SetII: Simple interfacing with 8085

SET III: Programming using C

Note for distribution of 25 Marks in internal Assessment in Practical/Project Examination

- i) Ist assessment on the basis of day-to-day performance in the Laboratory/Project: 06
Marks
- ii) 2nd assessment on the basis of day-to-day performance in the Laboratory/Project: 06
Marks
- iii) Class Test : 08 Marks
- iv) Regularity of Attendance : 05 Marks