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  
Credits: 4

Title: Electronic Instrumentation  
Maximum Marks: 100  
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 angel 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 fate 
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 actable, Mono-stable and Bitable 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:

4. Electronic Devices and Circuit theory: Robert L Boylsted & Louis Nashlesky
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<th>Title</th>
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<td>EL-301(Practical)</td>
<td>Lab Course in Electronic Instrumentation</td>
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<tr>
<td>Duration: 3 hours</td>
<td>Maximum Marks: 50</td>
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<td>Credits: 2</td>
<td>External Examination: 25 Marks</td>
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**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

Set II: Transducers

SET III: Operational Amplifier

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

i) 1st 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) Title: Digital Electronics
Duration: 3 hours 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 sown, 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 daytime,

Unit V A/D and D/A converters
DAC’s specifications; DAC’s types: binary weighted resistor, R-2R ladder; ADC’s specifications; ACC’s toes: 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:

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

Course No. : EL-401(Practical)  Title: Lab Course in Digital Electronics
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: Logic Gates
Set II: Combinational Circuits
SET III: Sequential Circuits

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

i) 1st 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; Hertizian 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:**

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:

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
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-I*

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:**


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

Course No. : EL-601(Practical) Title: Lab. 1. Course in 8085µp 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) 1st 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