HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

B.E. SECOND YEAR

ELECTRONICS & COMMUNICATION

(In Force June 2006)

SEMESTER - III

EC 305: DIGITAL ELECTRONICS

Teaching Scheme		Examination Scheme				
Theory Hrs.	Practical Hrs.	Theory Hrs.	Theory Marks	Pract./ Viva Marks	Term Work Marks	Total Marks
4	2	3	100	25	25	150

SYLLABUS

1. **Binary Systems:** Digital Computer & Systems, Binary Numbers, Number Base conversions, Different Number systems & their relations, Complements, Binary codes, Binary storage & registers.

2. **Boolean Algebra & Logic Gates:** Basic definitions, Axiomatic definition of Boolean Algebra, Basic Theorems & Properties, Boolean functions, Canonical & Standard forms, Logic operations, Digital Logic gates & Logic families.

3. **Simplification of Boolean Functions:** Map method, Two, Three, Four, Five & Six variable maps, Products of Sum & Sum of Products simplification, NAND, NOR & Other two level Implementations, Don't care conditions, Tabulation method.

4. **Combinational Logic:** Design Procedure, Addres, Sub tractors, Code Conversion, Analysis Procedure, Multilevel NAND & NOR circuits, Exclusive-OR & Equivalence functions.

5. **Combinational Logic with MSI & LSI:** Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoders, Multiplexers, ROMs, PLAs.

6. **Sequential Logic:** Flip Flops, Triggering of Flip flops, Analysis of clocked sequential circuits, State reduction & assignment, Flip Flop Excitation tables, Design of Sequential circuits, Design of counters, Design using state equations.

7. **Registers and Counters:** Registers, Shift registers, Ripple Counters, Synchronous Counters.

8. **Digital Integrated Circuits:** RTL, DTL circuits, I2L Logic, TTL, ECL, MOS & CMOS circuits & their characteristics.

9. **HDL Programming:** Concepts of VHDL, Basic Definitions of Entity, Architecture, Behavioral Modeling of Digital systems & its simulations.

REFERENCE BOOKS:

1. Digital Logic & Computer Design by M. Morris Mano (PHI)
2. Digital Electronics by R.P.Jain
3. Digital Principles By Malvino & Leach
4. VHDL Primer By J.Bhasker (Pearson)
5. VHDL Programming by Example, 4th edition, by Douglas Perry (TMH)