



Tolani College of Commerce (Autonomous)

तोलानी वाणिज्य महाविद्यालय (स्वायत्त)

(Sponsored and Managed by Tolani Education Society, Mumbai - 400 021)

(Recognised Linguistic (Sindhi) Minority Institution, Affiliated to University of Mumbai)

Re-Accredited (3rd Cycle) by N.A.A.C. with 'A' Grade (CGPA 3.03)

Knowledge is Supreme

150-151, SHER-E-PUNJAB SOCIETY,
GURU GOBIND SINGH ROAD,
ANDHERI (EAST), MUMBAI-400 093.

Tel. : (022) 6153 5455

Fax : (022) 6153 5456

E-mail : tcc@tolani.edu

Website : tcc.tolani.edu

Name of the Department/ Programme	Bachelor of Science in Information Technology					
Name of the Course	Major: Digital Electronics					
Semester	I					
Number of Credits	2					
Number of Lectures	30					
Lecture Duration	60 Minutes					
Total Marks:	CE	20	SEE	30	Total	50

Learning Objectives of the Course

Sr.No.	Objectives
LOC1	To introduce the basics of logic in digital electronics as an entry level course
LOC2	To interpret and assess number systems and the conversions of number systems
LOC3	To analyse the boolean expressions and reduce the expression to the minimum.
LOC4	To design simple logic circuits using tools such as Boolean Algebra and Karnaugh Mapping.
LOC5	To understand the state of a memory cell and its types using flip-flops

Learning Outcomes of the Course

Sr. No.	Outcomes
CO1	Apply number conversion techniques in real digital systems
CO2	Derive and design logic circuits by applying minimization in SOP and POS forms
CO3	Design and develop Combinational and Sequential circuits



Tolani College of Commerce (Autonomous)

तोलानी वाणिज्य महाविद्यालय (स्वायत्त)

(Sponsored and Managed by Tolani Education Society, Mumbai - 400 021)

(Recognised Linguistic (Sindhi) Minority Institution, Affiliated to University of Mumbai)

Re-Accredited (3rd Cycle) by N.A.A.C. with 'A' Grade (CGPA 3.03)

Knowledge is Supreme

150-151, SHER-E-PUNJAB SOCIETY,
GURU GOBIND SINGH ROAD,
ANDHERI (EAST), MUMBAI-400 093.

Tel. : (022) 6153 5455

Fax : (022) 6153 5456

E-mail : tcc@tolani.edu

Website : tcc.tolani.edu

Syllabus in Detail

Unit	Details	Lectures
I	Number System: Binary number system, octal number system, hexadecimal number system, conversion from one number system to another, weighted codes binary coded decimal, non-weighted codes Excess – 3 code, Graycode Binary Arithmetic: Binary addition, Binary subtraction, Negative number representation, Subtraction using 1's complement and 2's complement, Binary multiplication and division, Arithmetic in octal number system, Arithmetic in hexadecimal number system, BCD and Excess – 3 arithmetic. Boolean Algebra and Logic Gates: Introduction, Logic (AND OR NOT), Boolean theorems, Boolean Laws, De Morgan's Theorem, Perfect Induction, Reduction of Logic expression using Boolean Algebra, Deriving Boolean expression from given circuit, exclusive OR and Exclusive NOR gates, Universal Logic gates, Implementation of other gates using universal gates,	10
II	Minterm, Maxterm and Karnaugh Maps: Introduction, minterms and sum of minterm form, maxterm and Product of maxterm form, Reduction technique using Karnaugh maps – 2/3/4 variable K-maps, Grouping of variables in K-maps, K-maps for product of sum form, minimize Boolean expression using K-map and obtain K-map from Boolean expression. Combinational Logic Circuits: Introduction, Multi-input, multi-output Combinational circuits, Code converters design and implementations Arithmetic Circuits: Introduction, Adder, BCD Adder, Excess – 3 Adder, Binary Subtractors, Comparator.	10



Tolani College of Commerce (Autonomous)

तोलानी वाणिज्य महाविद्यालय (स्वायत्त)

(Sponsored and Managed by Tolani Education Society, Mumbai - 400 021)

(Recognised Linguistic (Sindhi) Minority Institution, Affiliated to University of Mumbai)

Re-Accredited (3rd Cycle) by N.A.A.C. with 'A' Grade (CGPA 3.03)

Knowledge is Supreme

150-151, SHER-E-PUNJAB SOCIETY,
GURU GOBIND SINGH ROAD,
ANDHERI (EAST), MUMBAI-400 093.

Tel. : (022) 6153 5455
Fax : (022) 6153 5456
E-mail : tcc@tolani.edu
Website : tcc.tolani.edu

Unit	Details	Lectures
III	Multiplexer, Demultiplexer, ALU, Encoder and Decoder: Introduction, Multiplexer, Demultiplexer, Decoder, ALU, Encoders. Sequential Circuits: Flip-Flop: Introduction, Terminologies used, S-R flip-flop, D flip-flop, JK flip-flop, Race-around condition, Master – slave JK flip-flop, T flip-flop. Counters: Introduction, Asynchronous counter, Terms related to counters, IC 7493 (4-bit binary counter), Synchronous counter Analysis of counter circuits. Shift Register: Introduction, parallel and shift registers, serial shifting, serial-in serial-out, serial-in parallel-out, parallel-in parallel-out, Ring counter.	10

Books and References:					
Sr. No.	Title	Author/s	Publisher	Edition	Year
1.	Digital Electronics and Logic Design	N. G. Palan	Technova		
2.	Make Electronics	Charles Platt	O'Reilly	1 st	2010
3.	Modern Digital Electronics	R. P. Jain	Tata McGrawHill	3 rd	
4.	Digital Principles and Applications	Malvino and Leach	Tata McGraw Hill		
5.	Digital Electronics: Principles, Devices and Applications,	Anil K. Maini	Wiley		2007