

## Digital Computing Logics Fundamentals

Courses: BSCS-401 / CSSE-303 / CS-501

(Course Incharge: Sir Hussain Saleem, Assistant Professor, Department of Computer Science, UBIT, University of Karachi, Pakistan)

### 1. Books:

1. Digital Fundamentals, 11/ed  
Thomas L. Floyd (FLOYD)
2. Digital Computer Electronics, 3/ed  
Malvino-Brown (MALVINO)

### 2. Contents List & Chapters:

- 2-1. Introduction to Digital Concepts [FLOYD: Ch-1\*, Ch-14 (14.1)]
- 2-2. Logic Functions and Operations [FLOYD: Ch-3\*; MALVINO: Ch-2]
- 2-3. Number System and Digital Codes [FLOYD: Ch-2\*, Ch-6 (6.7); MALVINO: Ch-1, Ch-6 (6.6, 6.7)]
- 2-4. Solid-State Circuits (TTL, DDL) [FLOYD: Ch-15 (15.1, 15.3, 15.4); MALVINO: Ch-2(2.1, 2.2, 2.3), Ch-4]
- 2-5. Combinational Logic Analysis [FLOYD: Ch-5\*; MALVINO: Ch-3]
- 2-6. Logic Algebra & Circuit Minimization [FLOYD: Ch-4\*; MALVINO: Ch-5]
  - i) Boolean Algebraic Method
  - ii) Karnaugh Map (Horizontal, Vertical, Square, Rectangular Cells), (Upto 5 variables)
  - iii) Quinn McClusky Method (Upto 8 variables)
  - iv) Truth Table, Logic Equations, and Logic Map method
  - v) Logic Friday Transformations (Software Tool)
  - vi) Solid-State Circuit Transforming from Logic Map (Simple & Detailed Circuits)
- 2-7. All Lectures, Exercises & Example Questions covered in Class.

\* Articles of Floyd Ch: 1-5, 2-12, 3-7, 4-12, 5-6 are NOT INCLUDED.

### 3. Paper Pattern & Marks Distribution:

Semester Heads: Theory 80 Marks, Lab 20 Marks, Passing Heads: 50% Marks

- Theory 80 Marks:
  - Final Paper: 50 Marks would be based on Analytical, Numerical, Circuit Based Logic Questions. 4Q to 6Qs, 20% Choice. Read “Tips & Important to Note” in subsequent headings for preparation of Exam.
  - Numerical Register: 30 Marks should be submitted as Phase-wise Assignment as Softcopy at your Turnitin space.
- Lab 20 Marks:
  - Lab Workshop/File should be submitted Week-wise as Softcopy at your Turnitin profile space with analytical workings.

### 4. Assignments:

1. **Numerical Register:** Do All Numericals given in Exercises, Examples etc. as per above content list Ref. 2-1 to 2-7.  
Submission-1: Contents: Only 2-1, 2-2, 2-3, 2-7 (Relevant).  
Submission-2: Contents: Only 2-5, 2-6(i~v), 2-7 (Relevant).  
Submission-3: Contents: Only 2-4, 2-6(vi), 2-7 (Relevant).
2. **Lab Workshop:** Week-wise Lab Objectives (As per Contents above).  
Submission: Week-wise. Immediately after Class/Lab till every Saturday Night.

### 5. Marks Deduction on Carelessness:

Deduction on your “Carelessness” of 20 marks for leaving any discrepancy in violating the instructions/guidelines for (1) Development of your Turnitin Profile, or (2) Assignment Submission method, or (3) violating exam related instructions present in Question Paper, (4) irrelevant use of social media to post any misleading content related to this Course etc. There will be no excuse acceptable for that.

### 6. TurnITin Webspace for Class Facilitation (www.turnitin.com):

- The TurnITin webspace has been configured for class facilitation.
- Enrolment ID and Joining Password has been shared with class with expiry date as well.
- In Profile: Goto UserInfo, Enter First Name as your “SEAT No. without <space>, <symbols>, -, #, \_ :>”, and Last Name as your “NAME in All Capitals” as per record register/enrollment. Set the default mode as “Student”. Set your security question for password recovery if forgot later. Do not change any other setting.
- Do not develop multiple profiles with multiple email IDs, otherwise your profile will be locked at any stage.
- Only one email ID should be registered to your Course Incharge, and that should be maintained till the release of the results.
- You should check regular updates and view Calendar time to time.
- Announcements and Assignment Objectives will be updated on calendar as well as on specified links at TurnItIn.

## 7. Assignment Submissions (Numerical Register/Lab Workshops):

- **Place:** All submissions should be dropped ***Only at Turnitin webspace*** at mentioned links on/before Due Date/Time.
- **Submission Method:**
  - i. Download the MSWord File Format from Turnitin Calendar. Do not modify any setting etc.
  - ii. Take photo snaps of your Handwritten Assignment/Lab work that you have done in your “Notebook/Register/File” and save them in specific Folder of your Computer; Open MS-Word Template Document; Click on “Header Area” and modify Seat No., Name, Assignment Title, Course Title with Course Code.
  - iii. Develop the Document with inserting the saved snaps with appropriate size, crop and sharpness selected from “Picture Tool” of MS-Word. Save the whole file as PDF; and Upload at specified link on Turnitin. (Must avoid any other format, it will not be considered).
  - iv. None of the work will be accepted as physical submission or re-submission. Nor submissions via email or other medium will be accepted. Caution: Try to submit your work at least Six hours earlier to the expiry time. Extension in Time will not be granted.
- **Digital Receipt:** You will receive a “Digital Receipt” as a proof of submission in your email immediately after successful upload. You should retain Digital Receipt carefully for future reference.
- **Evaluation Criteria:** Complete according to content list, Quality of work i.e. practices and presentation of work along with complete paper work; Timely Submission.
- **Assignment Submission Ethics:** If you share your Turnitin Profile password to anybody for your work submission, or If you accepted responsibility to submit any other person’s work, or submitted the other person’s copied work as either Full or Partial, or from anywhere (Book/Internet), You will be awarded “0” “ZERO” in your final award sheet. All upcoming work submission will also be treated useless for you to submit. Your Account might be locked in that case.
- **Advice:** Do not submit the work that you have not done by your own effort to prevent gaining Zero. (This is **ZERO TOLERANCE POLICY**). You are also advised to secure your Assignment Book at home and bring incase if you are asked to show physically.

## 8. Exam related Tips / Important to Note:

1. Do and Practice All Numericals given in Exercises, Examples etc. as per above content list.
2. All 03 and above variable type questions covered using K-map should be solved with Quinn McClusky method also.
3. Practice to remember internal configurations of basic standard IC i.e. 74XX, where XX: 00, 02, 04, 08, 32, 86.
4. Practice and Remember to Draw All Solid-State Circuits (TTL, DDL) and their operation flow mentioned above in Ref.2-4 of Content list (Solid-State Circuits).
5. Practice to develop “Solid-State (Ref.2-6-vi)” as well as “Logic-Map based” Circuit for All Logic equations upto 8 variables.
6. Practice Floating Point and Signed Numbers and their conversions. (BIN, OCT, DEC, HEX)

## 9. General Instructions:

- **Every candidate has to maintain at-least 75% Attendance throughout the course (Theory & Labs).**  
None of the G1-Form should be presented by any candidate to request endorsement for relief as “Short-of-Attendance”.
- **Candidates with less than 60% Attendance are clearly IN-ELIGIBLE, they should avoid to appear for exam.**
- Every individual should maintain own attendance record for safe-side.
- **Highly Mandatory:** You will be instructed at exam-time to **Upload your Admit Card/Semester Fees Receipt Snap/Scanned image (with your Email-ID written on it)** before Exam Date at Turnitin weblink. Failing so, otherwise you will not be informed about your Tentative Scores/Result status nor will your query be listened or responded.
- Carefully read Exam related Instructions on your Admit Card, Question Paper and follow accordingly.

## 10. Repeaters/Improvement Candidates

- Repeaters/Improvement candidates should undertake before appear in exam that whatsoever they will do in exam, they will be awarded accordingly.
- Retain of Marks is not a rule. Marks will not be retained. Do not expect or request for favor with lame reasons of GPA increase etc. Marking criteria will be same as for Regular students.
- Repeaters should must get registered themselves for the Course in first week of start of the Semester by submitting the written request to the Course Incharge. They will not be registered later.
- Repeaters should produce (i) Past attendance record summary to be obtained by past teacher, (ii) Past proforma copy.
- Repeaters should follow all instructions that are given to regular candidates and submit updated Numerical Register work as per content list on prescribed link only on due date/time. Past/Incomplete submission is not valid.
- **Those who were already appeared for this course as IMPROVEMENT candidate in any past year(s), are advised not to appear for this time without prior consultation.**

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