PUNJAB BOARD OF TECHNICAL EDUCATION LAHORE



COURSE CONTENTS

FOR

POST MATRIC
DIPLOMA IN INFORMATION TECHNOLOGY
(2-YEAR)

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SCHEME OF STUDIES & EVALUATION PLAN FOR POST MATRIC DIPLOMA IN INFORMATION TECHNOLOGY (2-Year)

First Semester (First Year)

		Classes per Week		Marks		
S.N	**SUBJECT**	**Theory**	**Practical**	**Theory**	**Practical**	**Total**
1	ICT	3	3	75	25	100
2	Introduction to MS-Office	3	3	75	25	100
3	Computer Networks	3	3	75	25	100
4	Operating System	3	3	75	25	100
5	Introduction to Programming	3	3	75	25	100
6	Library Activities	-	2	-	-	-
Total		15	17	375	125	500

Second Semester (First Year)

S.No	**SUBJECT**	**Classes per Week**		**Marks**		
		Theory	**Practical**	**Theory**	**Practical**	**Total**
1	English-I	6	0	100	0	100
2	Urdu-I	6	0	100	0	100
3*	Islamiat / Religious Education	3	0	50	0	50
4**	Mutalae Quran-e-Hakeem	3	0	50	0	50
5	Elective Subjects (Any one combination of 03 Subjects from the give list.)	6+6	0	100+100	0	200
6	Library Activities	-	2	-	-	-
Total		30	2	500		500

Subject combinations for Computer Science Group

1	**2**	**3**
i. Mathematics-I ii. Economics-I iii. Computer Science ***	i. Mathematics-I ii. Statistics-I iii. Computer Science ***	i. Mathematics-I ii. Physics-I iii. Computer Science ***

* Islamyat / Islamic Education / Religious Education / Ethics (for Non-Muslims)

** Mutalae Quran-e-Hakeem / Translation of the Holy Quran / Ethics or Civics (For Non-Muslims)

***The subjects of Computer Science will be studied in First year (Part-I & Part-II)

Third Semester (Second Year)

S.No	SUBJECT	Classes per Week		Marks		
		Theory	Practical	Theory	Practical	Total
1	English-II	6	0	100	0	100
2	Urdu-II	6	0	100	0	100
3	Pak-Study	3	0	50	0	50
4*	Mutalae Quran-e-Hakeem	3	0	50	0	50
5	Elective Subjects (Any one combination of 03 Subjects from the give list.)	6+6	0	100+100	0	200
6	Library Activities	-	2	-	-	-
Total		30	2	500	0	500

Subject combinations for Computer Science Group

1	2	4
i. Mathematics-II ii. Economics-II iii. Computer Science **	i. Mathematics-II ii. Statistics-II iii. Computer Science**	i. Mathematics-II ii. Physics-II iii. Computer Science**

* Mutalae Quran-e-Hakeem / Translation of the Holy Quran / Ethics or Civics (For Non-Muslims)

** The subjects of Computer Science will be studied in First year (Part-I & Part-II)

Fourth Semester (Second Year)

		Classes per Week		Marks		
S.N	SUBJECT	Theory	Practical	Theory	Practical	Total
1	Data Base System	3	3	75	25	100
2	Video Editing	3	3	75	25	100
3	Web Development Essential	3	3	75	25	100
4	Graphics Design	3	3	75	25	100
5	Project	0	6	0	100	100
6	Library Activities	-	2	-	-	-
Total		12	20	300	200	500

COURSE CONTENTS
DIT FIRST SEMESTER
FIRST YEAR

Introduction to Information & Communication Technologies (ICT)

(DIT Part – I)

Total Marks:	100	Theory Marks:	75	Practical Marks:	25
Total Weeks:	20				
Contact Hours per week:	06				
Total Contact Hours:	120				
Theory Hours:	40				
Practical Hours:	80				

Course Description:

This course is designed for students with little or no computer experience. This course introduces computer concepts, hardware components, basic computer operations and use of software applications to solve problems. Students will have complete understanding of the basic concepts and use of personal computers and application software.

Aims and Objectives:

After successful completion of this course, students should be able to:

- Develop a vocabulary of key terms related to computers and software programs
- Identify the components of a personal computer system
- Demonstrate mouse and keyboard functions
- Demonstrate window and menu commands and how they are used
- Demonstrate how to organize files and documents on a USB/hard drive
- Demonstrate basic maintenance of a computer
- end email messages and navigate and search through the internet.

Module	Course Contents	Allotted Weeks	Contact Hours
01	**INTRODUCTION TO COMPUTERS** 1.1 History and Evolution of Computers 1.2 Hardware Components: Input Devices, Output Devices, System Unit, Storage Devices, Communication Devices 1.3 Computer Software: System Software, Application Software, Installing and Running 1.4 Programs, Software Development 1.5 Computer Types: Personal Computers, Desktop Computers, Mobile Computing Devices, Embedded Computers, GameConsoles, Servers, Thin Clients, Mainframes, Supercomputers 1.6 Computer Applications: Education, Finance, Government, Health Care, Science, Publishing, Travel, Manufacturing	03 Weeks	18
02	**SYSTEM UNIT COMPONENTS** 2.1 The Motherboard 2.2 Processor The Control Unit, The Arithmetic Logic Unit, Machine Cycle, The System Clock, Comparison of PC Processors 2.3 Memory Bits, Bytes, Addressing, Types (RAM, ROM, Cache, Flash, CMOS) 2.4 Expansion Slots, Adapter Cards and Drive Bays 2.5 Ports and Connectors USB, VGA, HDMI, Audio, Network, FireWire 2.6 Power Supply	03 Weeks	18
03	**INPUT & OUTPUT DEVICES** 3.1 What is input? 3.2 Keyboard and Pointing devices Mouse, Joystick, Trackball, Touchpad 3.3 Touch Screen, Pen and Stylus 3.4 Other types of input Game Controllers, Digital Cameras, Voice Input, Scanners, Biometric, Terminals 3.5 What is output? 3.6 Display Devices: CRT Monitors, LCD/LED Monitors 3.7 Printers: Non-Impact/Impact, Inkjet, Laser, Multifunction, Thermal, Plotters & Large format printers 3.8 Other Output Devices: Speakers, Headphones, Multimedia Projectors, Interactive Whiteboards	02 Weeks	12

04	**DIGITAL STORAGE** 4.1. Hard Disks Characteristics of a Hard Disk, Internal/External, RAID, NAS 4.2. Flash Storage Solid State Drives, Memory Cards, USB Flash Drives, ExpressCard Modules 4.3. Optical Storage CDs, DVDs, Blue-ray Disks 4.4. Magnetic Tape Storage 4.5. Cloud Storage	02 Weeks	12
05	**SYSTEM SOFTWARE** 5.1. Operating Systems 5.2. OS Functions Starting and Shutting Down a Computer, Providing a User Interface, Managing Programs, Managing Memory, Coordinating Tasks, Configuring Devices, Establishing an Internet Connection, Monitoring Performance, Providing File Management and Other Utilities, Updating Software Automatically, Controlling a Network, Administering Security 5.3. OS Types: Stand-Alone OS, Server OS, Embedded OS; Windows, Linux 5.4. OS Utility Programs: File Manager, Search Utility, Uninstaller, Image Viewer, Disk Cleanup, Disk Defragmenter, Backup and Restore Utilities, Screen Saver, Firewall, Antivirus Programs, Spyware and Adware Removers, File Compression, Media Player, Disc Burning 5.5. Personal Computer Maintenance	03 Weeks	18
06	**APPLICATION SOFTWARE** 6.1. The need and role of Application Software 6.2. Working with Application Software 6.3. Business Software Word Processing, Spreadsheets, Databases, Presentations, Project Management, Personal Information Manager Software, Business Software for Smartphones, Accounting Software Graphics & Multimedia Software: Computer-Aided Design, Desktop Publishing, Paint/Image Editing Software, Video and Audio Editing Software, Multimedia Authoring, Web Page Authoring Software 6.4. Web Applications 6.5. Typing Assistance Software (Typing Tutor/Master etc)	03 Weeks	18

07	**THE INTERNET AND THE WORLD WIDE WEB** 7.1. Network and the Internet Connecting to the Internet Access Providers How Data Travel on the Internet Internet Addresses 7.2. The World Wide Web Browsing the Web Web Addresses Navigating Web Pages Searching on the Web Types of Web Sites Web Publishing 7.3. E-Commerce 7.4. Other Services on the Internet: E-Mail, Instant Messaging, VoIP, FTP, Video Conferencing, Social Media 7.5. Computer Security Computer Malware and Attacks Safeguards against Viruses, Worms, Trojan Horses, Malware 7.6. Information Privacy 7.7. Computer Ethics 7.8. Cybercrimes 7.9. Health Concerns of Computer Use	04 Weeks	24
	Total	**20**	**120**

Lab Requirements **(Hardware / Software)**	• A modest PC, preferably with Core i3 generation 3rd or above processor, with at least 4GB RAM and 200GB hard disk, LCD, Printer and preferably a scanner • DSL internet connection with Access Point/Modem/Switch and related cables and connectors • MS Windows 10 or above • Typing Tutor/Master or any other available typing software • Other Application Software, may be downloaded from the web
List of Practical	• Opening system box and identifying hardware components (processor, RAM, HDD, slots, ports etc) • Installing/uninstalling hardware components • Identifying, connecting, disconnecting cables and external devices like printers, monitors etc • Troubleshooting hardware issues • Windows installation and configuration • Typing Tutor/Master installation • Other Application Software installation • Familiarization with Windows icons • Windows Command Prompt and familiarization with basic DOS commands • Creating icons and shortcuts • Playing with Control Panel • Finding specifications of a computer • Formatting hard drives • Creating, copying, moving, deleting files and directories • Disk defragmentation • Disk backup and restore • User Management on Windows • Updating software manually and automatically • Troubleshooting software issues • Printer installation and troubleshooting • Toner replacement, Paper jam resolution • Connecting and using scanners • Playing with Windows Task Manager • Identifying file types and associating default programs for opening • Zipping and unzipping files • Disk burning • Installation of free Antivirus software and scanning files for malware • Connecting to the internet • Identifying Access Points, Modems, Switches and cables • Creating email addresses and sending/receiving emails • Connecting with and browsing LAN • Installing and using different web browsers • Browsing and searching the Web • Using Google Advanced Search • Using Video Conferencing software
Reference Material	• Shelly, G. B., & Vermaat, M. E. (2012). *Discovering computers fundamentals: your interactive guide to the digital world (Latest ed.)*. Cengage Learning

Introduction to MS Office

(DIT Part-I)

Total Marks:	100	Theory Marks:	75	Practical Marks:	25
Total Weeks:	20				
Contact Hours per week:	06				
Total Contact Hours:	120				
Theory Hours:	40				
Practical Hours:	80				

GENERAL OBJECTIVES:

After the completion of this course, students are expected to be able:

- To design documents for personal and business use by using Microsoft Office 2016.
- To prepare documents in English/Urdu language by using MS Word.
- To design spreadsheets by using Microsoft Excel 2016.
- To enhance productivity by automating several computational tasks using Excel Macros.
- To present complex data or ideas in an easy to understand form by using Microsoft PowerPoint 2016.
- To develop small scale databases using Microsoft Access 2016.

Module	Course contents	Allotted Weeks	Contact Hours
01	**INTRODUCTION TO OFFICE AUTOMATION SOFTWARE** 1.1 Introduction 1.1.1 Open Source Software 1.1.2 Proprietary Software 1.2 Introduction to Microsoft Office Suite 2016 1.3 MS Office Applications' Primary User Interface 1.3.1 Title bar 1.3.2 Quick Access Toolbar 1.3.3 Quick Access Toolbar 1.3.4 Ribbon 1.3.5 Ribbon Commands/Tabs 1.3.6 Document Page 1.3.7 Status bar	01 Week	06
02	**MICROSOFT WORD** 2.1 General Features of Word processors Editing, Formatting, Page Layout & Printing, Spelling & Grammar, Header & Footer, Picture / Table Insertion & Formatting, Screen Layouts. 2.2 BASIC EDITING Creating a New Document, Saving a Document for the First Time, Saving Document in Different File Formats, Creating a Document Using a Template, Using Print Preview, Printing a Document, Opening an Existing Document, Using Zoom, Finding and Replacing Text, Using AutoCorrect, Cutting Copying and Pasting Text. 2.3 TEXT FORMATTING Using the Font Group, Changing Fonts and Font Sizes, Applying Character Attributes, Setting Character Spacing, Using Format Painter, Applying Styles, Creating and Modifying WordArt, Using the Clear Formatting Button. 2.4 PARAGRAPH FORMATTING Formatting Paragraph, Setting Indents (First Line, Hanging, Left, Right), Setting Line Spacing, Setting Paragraph Spacing, Creating a Bulleted List, Creating a Numbered List. 2.5 PAGE FORMATTING & PRINTING The Layout Tab, Setting Margins, Selecting Page Orientation, Choosing Paper Size, Number of Columns setting, Page & Section Breaks. Selection of Printer, Print Settings. 2.6 CREATING TABLES Using the Insert Table Dialog Box, Layout Tab on the Table Tools Ribbon (Using AutoFit, Resizing a Row or Column, Merging and Splitting Table Cells). 2.7 URDU LANGUAGE SETTING AND TYPING 2.7.1 Built-in settings in Windows-10 OS 2.7.2 Using Pak-Urdu Installer in Older Windows OS	04 Weeks	24
03	**MICROSOFT EXCEL** 3.1 General Features of Spreadsheets Rows, Columns, Worksheets, Workbooks, Functions and Formulas, Editing, Formatting, Screen Layouts. 3.2 WORKING WITH EXCEL Creating a New Workbook, Opening an Existing Workbook, Entering	09 Weeks	54

	and Editing Data in Worksheet (Entering Basic Data, Deleting and Clearing Cell Contents, Entering Dates, Cutting, Copying and Pasting Data). 3.3 FORMATTING CELLS AND WORKSHEETS Inserting and deleting cells, Merge cells, Format Cells by using Format Painter, Insert and delete columns or rows, Insert headers and footers, Rename a worksheet, Add a worksheet to an existing workbook, Change magnification by using zoom tools. 3.4 USING FORMULAS AND FUNCTIONS Understanding Formulas, Using Absolute and Mixed Cell References in Formulas, Using Cell Ranges in Formulas, Summarizing Data Using Functions (SUM, COUNT, COUNTA, COUNTBLANK, AVERAGE, MIN, MAX), Using Conditional Logic Functions (IF, AND, OR), Using Formulas to Conditionally Summarize Data (SUMIF, COUNTIF), Using Formulas to Modify Text (LEFT, RIGHT, MID, TRIM, UPPER, LOWER, CONCATENATE). 3.5 CREATING CHARTS Creating a new Chart, formatting a Chart with a Quick Style, formatting a Data Series, modifying a Chart's Legend, choosing a different chart type, Switching Between Rows and Columns in Source Data. 3.6 EXCEL MACROS 3.6.1 Definition of Macro 3.6.2 Adding the "Developer" Tab on Ribbon 3.6.3 Steps involved in Recording a simple Macro 3.6.4 Recording a Macro using Absolute References 3.6.5 Recording a Macro using Relative References. 3.6.6 Running a Macro 3.6.7 Creating a Macro for adding a list of items (such as cities, countries, fruits etc) 3.6.8 Creating a Macro for changing the Font and Font size of the whole worksheet 3.6.9 Creating a Macro for changing Date format 3.6.10 Assigning a macro to a Control Button		
04	**MICROSOFT POWERPOINT** 4.1 INTRODUCTION PowerPoint Startup Screen, User Interface Components (Title Bar, Quick Access Toolbar, Ribbon, Dialog Box Launcher, Slides Pane, Main Work Area, Status Bar), Ribbon Tabs. 4.2 PRESENTATION BASICS Creating a Presentation, Saving a Presentation, Closing a Presentation, Adding New Slides to a Presentation, Selection of Layout, Duplicating Selected Slides, Rearranging Slides in a Presentation, Deleting Slides from a Presentation, Using the Print Preview for Printing Slides, Changing Print Layout. 4.3 WORKING WITH TEXT Using Text Box to Slides, Changing Font Size & Color, Using Format Painter, Creating Numbered Lists, Creating Bulleted Lists, Formatting the Text Box (Using Quick Style, Applying Fill & Border, Applying Texture & Pattern Fill), Checking Spelling. 4.4 ADDING TABLES AND CHARTS IN A PRESENTATION Inserting a Table, Inserting Excel Worksheet, Applying Table Styles, Inserting Chart, Resizing & Moving a Chart. 4.5 USING ANIMATION Applying Transition Effects, Applying Animations, Using Motion Path	03 Weeks	18

	Animation, Modifying an Animation's Start Options and Timing, Setting Up a Slide Show, Using Presenter View, Creating interactive presentation using Zoom tool.		
05	**MICROSOFT ACCESS** 5.1 Introduction to Microsoft Access 2016 Creating a Database, Saving a Database, Opening an Existing Database. 5.2 Creating Tables Creating a Table in Datasheet view, Saving a Table, Creating a custom Table in Design View, Adding fields in a table, Data types in Access, Setting Primary Key field, Creating relationship between two tables. 5.3 Creating Forms Creating a simple Form, Creating a Form using Form Wizard, Creating a Form using Design View, Sorting data within a Form, Filtering data within a Form. 5.4 Creating Reports Creating a simple report, Creating report using Report Wizard, Creating Reports using Design View. 5.5 Creating Queries Creating a query from a table, Adding table to a query, Creating query from multiple tables, Adding criteria to a query.	03 Weeks	18
	Total	**20**	**120**

Lab Requirements (Hardware / Software)	a. Operating System: Minimum Windows 7 or 10 (32 or 64 bit) b. MS OFFICE 2016.

List of Practical

Practical Number	Description
	MICROSOFT WORD 2016
1	Running a Microsoft Application such as Word or Excel or PowerPoint or Access an identifying the main user interface components such as Title bar, Quick acces toolbar, Ribbon, Tabs, Document Page, Status bar etc.
2	Identifying different groups available in different Tabs in MS Word 2016.
3	Create a new document in MS Word 2016 using the File Tab and using the Quic Access Toolbar.
4	Saving a newly created document in a new folder with a unique file name in defau format.
5	Opening an existing document, adding some contents in it and saving it in PDF forma by using Save As command.
6	Create new documents by using different Sample Templates.
7	Open an existing multi-page document and explore the print command available i Backstage view for setting various options of Print, Printer and Settings.
8	Open an existing document and use the Font group of Home Tab for various for settings such as changing font name, font size, superscript, subscript, font color etc.
9	Open an existing document and use the Advanced tab of Font dialog box for changin the Character Spacing of the current document.
10	Open an existing document and use the Format Painter button for applying for attributes of a specific text to other text. And use the clear formatting button.
11	Create a new document, add multiple paragraphs of text and then use the Paragrap group of Home Tab for setting Left, Right, First Line and Hanging Indents.
12	Open an existing document and then use the Paragraph group of Home Tab for settin Line Spacing and Before/After Paragraph Spacing.
13	Create a new document, add data items on each line and then convert these data item into bulleted lists and numbered lists. Also create sub lists.

	14	Open an existing multi-page document and use the Page Setup group of Page Layout Tab for setting the page Orientation to Portrait / Landscape, and setting various page Sizes of the current document.
	15	Open an existing multi-page document and use the Page Setup group of Page Layout Tab for setting the Top, Right, Left and Bottom margins of the document.
	16	Open an existing multi-page document and add Page breaks and Section breaks in it.
	17	Open an existing document and use the Print command of the Backstage view for selecting a specific printer, specific page and number of print copies. Finally get a print.
	18	Create a new document and use the Insert Table command of the Tables group in Insert Tab for creating a 3 X 5 table. Add Column headings and Row headings, add data in cells. Resize the Rows height and Columns width.
	19	Open an existing document containing a table, and use the Merge Cells command and Split Cells command of the Merge group of Layout Tab of the Table Tools, for merging more than one cells and splitting a cell respectively.
	20	Install Urdu Language pack in windows 10 to enable Urdu typing. Install Phonetic keyboard for Urdu typing. Then create a new document and add text in Urdu language. Apply Arabic Typesetting and/or Urdu Typesetting fonts on the text.
	MICROSOFT EXCEL 2016	
	21	Starting the MS Excel 2016 for the first time and understanding various options available in the opening screen such as Blank Workbook, Searching for Online Templates, Suggested Searches, Taking a Tour, Recent, Opening other Workbooks etc.
	22	Starting the MS Excel 2016 and identifying or recognizing different user interface components of the application, such as Title bar, Command Tabs, Quick Access Toolbar, File Tab, Ribbon, Name Box, Formula bar, Worksheet Tab, Different groups on different Command Tabs, Row headings, Column headings, Active Cell.
	23	Create a new Blank Workbook. Add contents in all the three worksheets available by default. Save it in default format. Open it again and Save it in PDF format also.
	24	Open an existing Workbook. Add more data in it. Clear some cells' contents. Delete some cells. Cut/Copy some cells and Paste at another worksheet.
	25	Create a new Blank Workbook and add contents in a worksheet. Insert a new cell within the data cells. Insert new column between available columns. Insert new row between available rows. Delete a specific cell. Delete a column/row containing data. Use Format Painter.
	26	Open an existing Workbook. Rename its worksheets. Add two new worksheets. Merge some of the adjacent cells. Add Header and Footer in a worksheet. Fill data in adjacent cells in a worksheet by using the Fill Handle.
	27	Open an existing workbook having two or more worksheets containing data. Select data in a worksheet and print the selected data by choosing "Print Selection" in the print settings. Then print the Active worksheet. Then print the whole workbook.
	28	Create a new Workbook. Add some numeric data in a column. Using the formula bar, write a simple arithmetic equation after assignment operator and observe the result. Use the "Show Formula" button in Formula Auditing group of Formulas Tab to see the formula in the cell. Use this formula to understand the order of operators in excel.
	29	Create a new workbook and add numeric contents in a worksheet. Use a Relative reference to write a formula and then copy this formula into other cells to show that the reference is adjusted automatically. Then use an absolute reference. Then use a mixed reference to understand the difference.
	30	Open an existing workbook containing numeric data. Use an absolute reference to write a formula and then copy it to other cells to check that the reference is not changed. Then use a mixed reference to understand the difference.
	31	Open an existing workbook containing numeric and alphanumeric data. Use SUM(), COUNT(), COUNTA() and COUNTBLANK() functions for summarizing data.
	32	Open an existing workbook containing numeric data. Use AVERAGE(), MIN(), MAX() functions for summarizing data.
	33	Create a new workbook. Enter Name, Age in years, City Name and Cell Number of 10 students in a worksheet. Now use the AND function to choose only those students who belong to a specific city and having a specific age in years.
	34	Create a new workbook. Enter 10 students obtained marks in their 5 different subjects. Calculate the Total Obtained Marks column using the SUM function. By using a specific value for Total Marks, find the percentages of each student. Now use the IF function to assign grades to each student.

	35	Create a new workbook. Enter 10 records such that first column contains the names of Items purchased (e.g. Book, Apple, Sugar etc.), second column contains the Category of each item (e.g. Stationery, Fruit, Grocery etc.), third column contains the Price of each item. Now use the SUMIF function to calculate the total price of stationery items purchased.
	36	Open the same workbook used in practical No-35 above and add some more records in it. Then use the COUNTIF function to calculate the total number of grocery items purchased.
	37	Create a new workbook. Add 10 random string(text) values in column A. Then use the LEFT, RIGHT, MID, TRIM, UPPER, LOWER, CONCATENATE functions to modify the text values.
	38	Create a new workbook. Add data such that first column contains the students' class numbers and second column contains their test marks. Then Create a simple Line chart for this data set. Add proper titles for both axes. Modify Chart Title. Edit data series. Add/Remove chart Legend.
	39	Open the same workbook used in practical No-38 above and add third column for Test2 marks. Then create a simple line chart for comparing the marks of two tests. Then change the chart style.
	40	Open an existing workbook. Developer Tab is hidden by default. First show the Developer Tab to be able to use Macros and VBA tools. Go to File Tab, Click on "OPTIONS", Select "Customize Ribbon", then under the Main Tabs select the "Developer" check box and click ok.
	41	Steps involved in recording a macro: 1. Click on "Developer" Tab. 2. Decide whether to record the macro with Absolute References or Relative References (Absolute References is selected by default. If you want to use Relative References then click the button "Use Relative References" just below the Record Macro button). 3. Click the "Record Macro" button. 4. A dialog box appears; Write a meaningful name for this macro. 5. Select a key for short cut, shift+ key can also be selected. 6. Decide where the macro should be stored and add optional description of this macro. 7. Click "OK". 8. The "Stop Recording" button appears. 9. Perform all the steps that you want to be recorded. 10. Click "Stop Recording" button.
	42	Running a Macro: A recorded macro can be executed in two ways. 1. Click on "Developer" Tab, Click on "Macros" Button, A dialog box appears showing a list of all macros, Select your desired macro, Click "Run" button. 2. Use the short cut key that was selected before recording the macro.
	43	Macro for adding a list of items: 1. Click on "Developer" Tab and then click on "Use Relative References". 2. Start recording a macro. 3. Write 'macList' in the macro name box. 4. Press "SHIFT+L" in the short cut key for this macro. 5. Click "Ok". 6. Now type some names of cities or fruits etc. in each cell. 7. Click "Stop Recording" Button. 8. Open a new worksheet and click on "Macros" button in the "Developer" Tab, select the "macList" macro from the list of macros and click "Run" button. The list of cities or fruits will be printed here automatically. 9. Now open a new worksheet and press the short cut key "CTRL+SHIFT+L". The list is printed again.
	44	Macro for designing a blank Detailed Marks Certificate: 1. Open a new workbook, click on "Developer" Tab, click on "Use Relative References" button, click on "Record Macro" button. 2. Write 'macDMC' in name box and write "D" in the short cut key for this macro, click "Ok" button. 3. Now click in cell A1. Select range A1:D1, click "Merge and Center" button on Home Tab. 4. Write "Detail Marks Certificate", choose a specific Font color, Font size and Font name. 5. Write down student details such as Name, Roll No, Subjects, Subjects' marks etc. in different cells. 6. Write SUM function in a cell for calculating total marks. 7. Write a formula in a cell for calculating the percentage. 8. Format the contents' area by applying borders, colors, fonts, text alignments, column widths and row heights, fill color etc. 9. Click on "Stop Recording" button. 10. Now open a new worksheet and use the short cut key "CTRL+D" to print the whole designed format automatically. 11. It is a blank DMC. As you type data in its cells, it will automatically show the total marks and percentage in the appropriate cells.
	45	Assigning a macro to a control: 1.Open the same workbook created in practical No-44 above. 2. Open a new worksheet. 3. Click the "Insert" Tab, then click "Illustrations", then click "Shapes",

		then select “Round Corner” rectangle. 4. Draw a button in the blank worksheet. 5. Right Click on this button and select “Assign Macro” command from the menu. 6. Select the “macDMC” macro from the list of macros and click “Ok”. 7. Now click this button to add the DMC. Note that the “macDMC” macro can also be added in the Quick Access Toolbar.
	MICROSOFT POWERPOINT 2016	
	46	Create a new presentation in MS PowerPoint 2016 using the File Tab and using the Quick Access Toolbar. Add new slides in it. Add contents in the text boxes. And finally save the presentation in default format. Close the presentation file.
	47	Create a new presentation, select “Title Slide” layout for title slide and “Content and Title” layout for other slides. Add contents in slides. Insert new slides in between slides. Duplicate a slide. Rearrange some slides. Delete some slides.
	48	Open an existing presentation file containing multiple slides. Use print command of Backstage view for selecting different Print Layouts. Then select “2 slides” Handout and Print the slides.
	49	Create a new presentation by selecting the “Training” sample template. Add contents in slides. Format some text boxes using Quick Style, some using Applying Fill and Border, some applying Texture and Pattern Fill. Insert a table in a new slide and apply Table Style on it. Insert a chart based on this table.
	50	Open an existing presentation file. Apply different Transition effects on different slide such as Fade, Wipe, Split etc. Then apply different animations on text boxes in a slide such as Zoom, Swivel, Fly In etc. Setup Slide Show for this presentation.
	MICROSOFT ACCESS 2016	
	51	Start MS Access 2016. Create a new Database by selecting “Students” from Sample Templates using the Backstage view (File Tab). Explore different Objects, such as Tables Forms Reports Queries, of the database using Object Navigation Pane. Then Save and Close the database.
	52	Create a new Blank Database. Add Data items in the Table opened by default. Add 10 rows or records. Change Table View to Design View. Change the field names from Field1, Field2 etc. to Meaningful attributes. Change the data types of each field to appropriate data types. Change data type of ID field from AutoNumber to Number. Save the table.
	53	Open an existing Database and add more tables in it. Create primary keys in all tables. Add foreign key attributes in related tables. Then create relationships among related tables. Apply referential integrity rules on related tables. Save the database.
	54	Open an existing database. Create a simple form for an existing table. Create another form for another table by using Form Wizard. Sort data within forms. Filter data within forms.
	55	Open an existing database. Create a new form by using the “Form Design” button in the Forms group of the Create Tab. Add Existing Fields from Tools group in the Design Tab of Form Design Tools. Adjust the Heights and Widths of the Labels and text fields in the form design grid. Change the text format of Labels and Text fields. Change the view to Form View and navigate the form data. Save the database.
	56	Open an existing database. Create a new Simple Query by using the Query Wizard button on the Queries group of Create Tab. Add more data in the source table and then run the query again.
	57	Open an existing database. Run an existing Query. Change query view to Design View. Add Criteria for extracting specific records from the source table. Apply “AND” and/or “OR” criteria. Save the query and database.
	58	Open an existing database. Create a query based on multiple related tables.
	59	Open an existing database. Create a Simple Report through “Report” Button on the Reports group of Create Tab. Change the report view to “Print Preview”. Make changes to report layout in Layout View.
	60	Open an existing database. Create a new report in Design View.

Reference Material	1. Book: Excel Macros for Dummies By “Michael Alexander” 2. YouTube Channel “ LearnIt Training” for MS OFFICE Applications. 3. Microsoft Official Academic Course (MOAC) which covers the following

	Microsoft Office Specialist (MOS) Exams: 3.2.MOS Exam 77- 725: WORD 2016 3.3.MOS Exam 77- 727: EXCEL 2016 3.4.MOS Exam 77- 729: POWERPOINT 2016 3.5.MOS Exam 77- 730: ACCESS 2016

Computer Networks

(DIT Part-I)

Total Marks:	100	Theory Marks:	75	Practical Marks:	25
Total Weeks:	20				
Contact Hours Per Week:	06				
Total Contact Hours:	120				
Theory Hours:	40				
Practical Hours:	80				

General OBJECTIVES:

After completing this course, students will be able to:

- Understanding the basic concept of computer networks.
- Understanding the different types of Cables used for Computer Networks.
- Configuring different network devices.
- Creating different network scenarios in a network simulator (packet tracer)

Module	Course Contents	Allotted Weeks	Contact Hours
01	**BASIC TERMINOLOGIES** 1.1. Components of a Communication Model 1.1.1. Definition 1.1.2. Host / Sender 1.1.3. Media 1.1.4. Message 1.1.5. Protocol 1.1.6. Destination / Receiver 1.2. Computer Networks 1.2.1. Basic Definition & Types 1.2.2. Geographical Area Wise (Physical) (LAN, MAN, WAN, Internet) 1.3. Virtual (Logical) 1.3.1. VLANS 1.3.2. VPNS 1.4. Function / Working	02 Weeks	12
02	**TOPOLOGY** 2.1. Definition 2.2. Types of Topologies 2.2.1. Wired (BUS, Star, Ring, Hybrid, Mesh) 2.2.2. Wireless (Wi-Fi, Satellite, Radio Wave)	02 Weeks	12
03	**NETWORKING DAVIES** 3.1. Node 3.2. NIC 3.3. Modem 3.4. Hub 3.5. Switch 3.6. Wireless Devices 3.6.1. Access Point 3.6.2. Wireless Modem 3.6.3. Wireless USB Antenna 3.7. WAN / Internet 3.7.1. Router 3.7.2. Switch	02 Weeks	12
04	**TRANSMISSION MEDIA** 4.1. Wired media (Guided Media) 4.1.1. Coaxial cable (10 Base2 10 Base 5 10Base T, 100Base X) 4.1.2. BNC Connector 4.1.3. Twisted pair cable 4.1.4. Unshielded twisted- pair i. Cat 2, Cat 3 (Voice Communication) ii. Cat 4, Cat 5, Cat 6 (Data Transmission) iii. RJ-45 Connector 4.1.5. Shielded twisted- pair 4.1.6. Fiber optic cable i. Single Mode ii. Multi-Mode 4.2. Wireless media 4.2.1. Why we use Wireless Media 4.2.2. Technologies i. Satellite ii. Wi-Fi iii. Bluetooth iv. Microwave	03 Weeks	18

	v. Radio Wave 4.3. Wireless communication with LANs 4.3.1. Introduction 4.3.2. Wireless Switches / Hub 4.3.3. Wireless NIC		
05	**HOW NETWORK TRANSFER DATA (NETWORK MODELS)?** 5.1. OSI Model 5.1.1. Application Layer 5.1.2. Presentation Layer 5.1.3. Session Layer 5.1.4. Transport Layer 5.1.5. Network Layer 5.1.6. Data Link Layer 5.1.7. Physical Layer 5.2. TCP/IP Model 5.2.1. Application Layer 5.2.2. Transport Layer 5.2.3. Network Layer 5.2.4. Physical or Link-Layer	03 Weeks	18
06	**IP ADDRESSES** 6.1. What is IP address? 6.1.1. Why we use IP Address 6.2. IPV4 6.2.1. Class A, Class B, Class C, Class D, and Class E, IP addresses 6.3. Introduction to IPv6 6.3.1. Why IP V6 introduced? 6.3.2. IP V6 address length (i.e. 128 bits)	02 Weeks	12
07	**PROTOCOLS** 7.1. Definition 7.2. Types 7.3. Routed protocols 7.3.1. Definition 7.4. Routing Protocols 7.4.1. Definition 7.5. Common Protocols 7.5.1. TCP / IIP 7.5.2. UDP 7.5.3. FTP 7.5.4. HTTPs	02 Weeks	12
08	**PRACTICAL PORTION** 8.1. Installing and Configuring Modem 8.2. DSL Configuration 8.3. Creating Straight Through cable 8.3.1. Practically demonstrate the connection of computer and hub / switch 8.4. Creating Cross Over Cable 8.4.1. Practically demonstrate the connection of two computers without hub / switch 8.5. Basic Commands for Troubleshooting 8.5.1. Ping, ipconfig / all, ipconfig / renew, ipconfig / release, trace route, 8.6. Packet Tracer (Simulation) 8.6.1. Installing network simulator 8.6.2. Practically Demonstrate 02-Computers Network	04 Weeks	24

	8.6.3. Configuring PC's with IP addresses subnet mask and gateway 8.6.4. Create two different topologies of 10-10 computers using Hub 8.6.5. Place Switch between hubs to connect both technologies 8.6.6. Configuring switches by giving name to switches and managementIP addresses 8.6.7. Connection PCs to switch and then ping each other` that they areworking properly.		
	Total	**20**	**120**

Lab Requirements **(Hardware / Software)**	**Recommended:** • Minimum 10 number of Core i3 Computers with 4GB RAM & 250 GB HD or Higher • Wire or Wireless HUB • Minimum 05 number of Crimping Tools • 01 RJ-45 Connector / Per Student • UTP Cable Cat-05 or Higher • Cable Tester • Windows 07 minimum • Cisco Packet Tracer **Additional Resources** • Windows 10 • Switch • Router • DSL Modem • 04 RJ-45 Connectors / Per Student
List of Practical	1. Identify hardware for networking i.e. • NIC • RJ-45 & RJ-11 Connectors • UTP Cable Cat-5 or higher • Crimping Tool • Cable Tester 2. Making Straight Cable 3. Connect the computers in LAN using hub 4. Making Cross-Over Cable 5. Connecting two computers using cross-over cable 6. Connecting two hubs or switches using cross-over cable 7. Use different network commands • Ping • Ipconfig • ipconfig / all • Arp –a • Hostname • Tracert 8. Installation of Packet Tracer 9. Creating LAN of two computers, gradually increase the number of computers 10. Creating Wireless LAN(WLAN) 11. Demonstrate the Ping Command 12. Installation, configuration of switch 13. Creating LAN using switch 14. Demonstrate the Router by connecting two different types of networks using Packet Tracer
Reference Material	• Networking Essential by Andrew Tanenbaum • Packet Tracer by Cisco (https://www.packettracernetwork.com/tutorials/)

Operating Systems

(DIT Part-I)

Total Marks:	100	Theory Marks: 75	Practical Marks: 25
Total Weeks:	20		
Contact Hours Per Week:	06		
Total Contact Hours:	120		
Theory Hours:	40		
Practical Hours:	80		

General Objectives:

After completion of this course, a student should be able to:

- Understand the basic concept of an operating system
- Understand different types of operating systems
- Install & configure windows 10
- Install & configure different peripheral devices

Module	Course Contents	Allotted Weeks	Contact Hours
	Theory Portion (Part-A)		
01	**OVERVIEW OF AN OPERATING SYSTEM** 1.1. What is Operating System? 1.2. Types of OS 1.2.1. Desktop OS i. Batch OS (Batch Processing) ii. Multiprogramming Operating System iii. Multiprocessing Operating System iv. Multitasking Operating System v. Network Operating System vi. Real Time Operating System vii. Time Sharing Operating System viii. Distributed Operating System 1.2.2. Mobile / Tablet OS i. Android a. What is android system b. Version & Upgrades ii. IOS	02 Weeks	12
02	**FUNCTIONS OF AN OPERATING SYSTEM** 2.1. Operating System Structures 2.1.1. User Interface 2.2. Functions 2.2.1. Memory Management 2.2.2. Process Management 2.2.3. Resources Management 2.2.4. File Management 2.2.5. Security 2.2.6. Deadlock Prevention 2.2.7. Coordination Between users and software's	02 Weeks	12
03	**PROCESSES** 3.1. Definition 3.2. Process States (05 States) 3.3. Process structure 3.3.1. PCB and components 3.4. Operations on Processes 3.5. Threads	02 Weeks	12
	Practical portion (Part-B)		
04	**INTRODUCTION TO WINDOWS 10** 4.1. Installation Requirements 4.2. How to create Bootable USB / DVD / CD 4.2.1. Rufus Software 4.3. Step-By Step Installation Process 4.4. Hard Disk Partition 4.5. GUI Basics / Desktop Basic 4.6. Start Menu 4.7. Task Bar 4.8. Settings 4.9. Driver / Hardware Installation 4.9.1. VGA / SVGA / AGP / Gaming Card 4.9.2. Sound Card 4.9.3. Network Interface Card i. Wired ii. Wireless	07 Weeks	42

	4.10. Software Installation 4.11. User Creation 4.11.1. Setting Properties 4.11.2. Assigning Role & Permissions 4.12. Tablet Mode 4.13. Dual Desktop 4.14. Network Settings 4.14.1. Join Workgroup 4.14.2. Connecting with DSL MODEM 4.14.3. Connecting with Hotspot 4.15. Updates & Security 4.16. Mouse & Keyboard Settings 4.17. Adding Urdu Keyboards 4.18. Installing & Configuring Printers & Scanner		
05	**NETWORK CONNECTIVITY (NETWORKING)** 5.1. Creating Workgroup 5.2. Assigning IP Address to NIC / HOST / Computer 5.3. File Sharing 5.4. Printer Sharing 5.5. Assigning Permissions to users 5.6. Practically demonstrate the data sharing between computers	03 Weeks	18
06	**WINDOWS SERVER 2019 / 2016** 6.1. Definition 6.2. Difference between client and Server 6.3. Role & Services 6.3.1. Print & Document Services 6.3.2. Active Directory 6.3.3. DHCP 6.3.4. DNS 6.3.5. WINS	04 Weeks	24
	Total	20	120

Lab Requirements **(Hardware / Software)**	Windows 10 Device Drivers Core i3 4GB RAM 250 GB HD or Higher Printer Scanner DSL Modem Additional: Webcam Joystick Barcode Reader HDMI Cable
List of Practical	1. Identify the basic components of computer i.e. CPU-MOUSE-KEYBOARD-MONITOR 2. Introduction to BIOS a. Setting System Date & Time b. Setting Boot-Devices Priority i. HD ii. USB Drive / Hard Disk iii. Network 3. Create bootable USB / DVD / CD 4. Windows 10 Installation 5. HD Partition during Installation 6. Setting username & computer name during installation 7. Changing Taskbar & Desktop settings 8. Device Drivers Installation a. Via Settings b. Without settings (Direct installation)

	9. Un-installing a software via settings 10. Converting windows from computer to tablet mode 11. Creating & using dual desktops 12. How to join a workgroup? 13. Configure & connect DSL Modem 14. Using Internet via Hotspot 15. How to add Urdu Keyboard & fonts 16. Printer Installation 17. Printer sharing on LAN 18. Scanner Installation 19. Demonstrate the scanning document process 20. Assign IP address to your computer 21. Share your files & folder 22. Assign Permissions 23. Password Recovery 24. Backup & Restore 25. Defender Additional a. Windows Server 2019/2016 Installation b. Install & Configure Active Directory c. Install & Configure DNS d. Install & Configure DHCP
Reference Material	1. Operating Systems by William stalling 2. Windows 10 simplified Book (Paul McFedries) 3. Operating System & Networks by Tariq Mahmood & Imran Saeed (IT Series)

Introduction to Programming

(DIT Part-I)

Total Marks:	100	Theory Marks:	75	Practical Marks:	25
Total Weeks:	20				
Contact Hours per week:	06				
Total Contact Hours:	120				
Theory Hours:	40				
Practical Hours:	80				

GENERAL OBJECTIVES:

After completion of this course, students will be able to write a python script that uses:

- Variables to store different data type values.
- Arithmetic Operators to perform calculations.
- Conditional Statement (If, else, elif), Execute a block of code based on certain condition. What to run and what to skip.
- Loops (for and While) to execute a block of code again and again based on certain conditions.
- Type Casting to convert the variable as per requirements i.e., from number to string or string to number.
- Strings, to store characters, and work with it by using different built-in functions.
- Lists that organize different data types together as a container.
- Functions
- Turtle library to create basic shapes such as Square, Rectangle, Triangle and Stars.

Module	Course Contents	Allotted Weeks	Contact Hours
Python Programming Language			
01	**Introduction to Programming** 1.1. What is a program? 1.2. Languages of Programming a computer 1.2.1. Machine Language 1.2.2. Assembly Language 1.2.3. High Level Language 1.3. Algorithm 1.4. Compiler vs Interpreter 1.5. Introduction and Benefits of Python 1.6. History of Python 1.7. Exercise	02 Weeks	12
02	**GETTING STARTED WITH PYTHON** 2.1. Downloading and Installation of Python IDE (PyCharm) 2.2. Anatomy of Python Program 2.3. Write your first Hello World! Script 2.4. Guidelines for creating Script 2.4.1. Importance of comments 2.4.2. Spacing 2.5. Programming Errors: 2.5.1. Syntax Error 2.5.2. Runtime Errors 2.5.3. Logical Errors 2.6. Exercise	02 Weeks	12
03	**VARIABLES & OPERATORS** 3.1. Variables in Python 3.2. Rules and Guidelines for creating a variable 3.3. Assignment Operator 3.4. Multiple Assignments 3.5. Use of Buit-in function (type) 3.6. Arithmetic Operators (+, -, /, *, **) 3.7. Type Conversion Vs Type Casting 3.8. Boolean Operator 3.9. Logical & Comparison Operators 3.10. Exercise	02 Weeks	12
04	**STRINGS** 4.1. Understanding Strings 4.2. Combine vs Repeat Strings 4.3. String's Buit in Methods (capitalize (), len (), lower (), upper (), strip (), replace (), startwith(), endswith()) 4.4. Exercise	02 Weeks	12
05	**LISTS** 5.1. Understanding Lists 5.2. Forward vs Backward Accessing 5.3. Changing, Removing and Adding Element 5.4. Slice a List 5.5. Membership Operator: in vs not in 5.6. Exercise	02 Weeks	12
06	**CONDITIONAL STATEMENT:** 6.1. if statement 6.2. else statement 6.3. elif statement 6.4. Exercise	02 Weeks	12

07	**LOOPS:** 7.1. for loop 7.2. while loop 7.3. continue vs break 7.4. Exercise	02 Weeks	12
08	**FUNCTIONS** 8.1. Understanding functions 8.2. print vs return statement 8.3. Variable scope 8.4. Default arguments 8.5. Exercise	02 Weeks	12
09	**WORKING WITH GRAPHICS** 9.1. Introduction to Turtle 9.2. Basic commands (forward(), back(), left(), right()) 9.3. Draw Shapes (Lines, Square, Rectangle, Circle, Star) 9.4. Working with Excel File using Panda 9.4.1. Reading an Excel file using Python 9.4.2. Writing into an excel file using Python 9.5. Other Useful Python Libraries 9.5.1. Numpy 9.5.2. Matplotlib 9.5.3. Tkinter 9.5.4. Django 9.5.5. Kotlin 9.5.6. Micropython 9.5.7. PyGame **Practical (25,26,27,28,29,30,31)**	04 Weeks	24
	Total	20	120

Lab Requirements **(Hardware / Software)**	**1. Hardware Requirements:** • CPU: Intel Core or Xeon 3GHz (or Dual Core 2GHz) or equal AMD CPU • RAM: 4 GB (6 GB recommended) • Display Resolution: 1280×1024 is recommended, 1024×768 is minimum. **2. Software Requirement:** • 64-bit versions of Microsoft Windows 11, 10, 8 • Install PyCharm Community
List of Practical	1. Write a script to display “Hello World!! “On console. 2. The electricity bills for the last three months have been 23000, 32000 and 64000. What is the average monthly electricity bill over the three-month period? Write an expression to calculate the mean, and use print() to view the result. 3. Write a script to calculate the area of circle. (Area of Circle: $= \pi r^2$). 4. Write a script that Count all letters, digits, and special symbols from a given string. **inputString** = "P@#yn26at^&i5ve" 5. Write a script to find all occurrences of “Baqir” in a given string ignoring

	the case. **inputString** = "Baqir is student of python programming class. Baqir belongs to district peshawar" 6. Write a script to split a given string on hyphens and display each substring. **inputString** = Bareera-is-a-data-scientist 7. Write a script to check whether a number entered by user is even or odd. 8. Write a script to check whether a number is divisible by 7 or not. 9. Write a script to takes score from a user between (1 and 100) and display its grade according to score. (Score: 1-50 Grade: Average) (Score: 51-70 Grade: Good) (Score: 71-100 Grade: Excellent). 10. Write a script to print First 10 natural numbers using loop (while, for). 11. Write a script to print factorial of the given number (while, for). 12. Write a script to calculate the sum of all numbers from 1 to a given number (while, for). 13. Write a program to print multiplication table of a given number (while, for) 14. Write a script to print the list the reverse order. 15. Write a script that takes five fruits name from the user and store it in a list. Display the list elements using for loop. 16. Write a script to turn every item of a list into its square. (numberList= [2,4,6,6,10]) 17. Write a script that copy all the elements of the given list and append it to new list name updatedList. list = [‘Mango’, ‘Apple’,’Banana,’Melon’,’Grapes’] 18. You have been given a Python list. Write a script to find value 20 in the list, and if it is present, replace it with 200. **list** = [22,12,25,667,988,387,20,188,77] 19. Write a script that takes an input string from a user and find that if the string exists or not in the given list. **list** = [‘Pakistan’, ‘Shayan’, ‘Baqir’, ‘GCMS’] 20. Write a script that find all the elements in a list start with letter B. Names = [“Ali”, “Shayan”,”Baqir”,”Bareera”,”Zulfiqar”] 21. Write a Python function that accepts two numbers as arguments and returns the sum. 22. Write a Python function that accepts different values as parameters and returns a list. 23. Write a Python function that returns multiple values. 24. Write a Python function to find the factorial of a number. 25. Write a python script to draw star on screen. 26. Write a python script to display rectangle on screen 27. Write a python script to draw square on screen.

	28. Write a python script to draw a circle on screen. 29. Write a python script to draw lines on screen.
Reference Material	• Introduction to Programming using Python by Y. Daniel Liang • Python For Dummies by Stef Maruch &Aahz Maruch • https://docs.python.org/3/tutorial/index.html